IMPLEMENTATION OF THE UPGRADED NORTHERN GULF OF MEXICO OPERATIONAL FORECAST SYSTEM (NGOFS2) AND THE SEMI-OPERATIONAL NOWCAST/FORECAST SKILL ASSESSMENT

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Center for Operational Oceanographic Products and Services
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EXECUTIVE SUMMARY

The upgraded Northern Gulf of Mexico Operational Forecast System (NGOFS2), using the Finite Volume Community Ocean Model (FVCOM) as its hydrodynamic core model, has been implemented to provide users with nowcasts (analyses of near present) and forecast guidance up to 48 hours of the 3-dimensional (3-D) physical conditions of the Northern Gulf of Mexico and part of the Mexican coast. The nowcast and forecast guidance includes water levels, 3-D water currents, salinities, and temperatures. By integrating the existing NGOFS, Northeastern Gulf of Mexico Operational Forecast System (NEGOFS), and Northwestern Gulf of Mexico Operational Forecast System (NWGOFS) and extending the model domain coverage to include the Lower Mississippi River up to Baton Rouge, Lake Pontchartrain, the Texas coast intracoastal waterways, and the Mexican coast into the model grid, NGOFS2 provides more accurate predictions than the previous National Ocean Service (NOS) NGOFS, NEGOFS, and NWGOFS. This is especially true during extreme weather events, such as hurricanes or tropical storms, and will save computer resources.

NGOFS2 has been running reliably with no instability issues since the nowcast/forecast (N/F) runs started in May of 2019, a period of time that includes 3 hurricane seasons. Standard model skill assessment of a 1-year semi-operational run (January 1, 2020-January 1, 2021) indicates that the Root-Mean-Square-Errors (RMSE) of oceanographic variables (water level, current speed, temperature, and salinity) are less than 0.15 meter (m) for water level, 0.26 meters per second (m/s) for current speed, 3°C for temperature, and 3.5 practical salinity unit (psu) for salinity, with the exception of the salinity and current speed variables at some stations. The successful implementation of NGOFS2 on the Weather and Climate Operational Supercomputing System (WCOSS) provides reliable forecast guidance for water levels, 3-D currents, salinities, and temperatures to support the NOS safe navigation mission, the U.S. Coast Guard (USCG) search and rescue mission, fisheries research, hypoxia (or "Dead Zone") studies, harmful algal blooms (HAB) tracking, and other applications in the Northern Gulf of Mexico.

This technical report documents how the Center for Operational Oceanographic Products and Services (CO-OPS) builds the control and static files for the High Performance Computing (HPC) Coastal Ocean Modeling Framework and then generates the required model forcing files that drive NGOFS2. The semi-operational nowcast and forecast model skill assessment and 2 applications are then presented.

1. INTRODUCTION

The Gulf of Mexico (GOM)—with boundaries defined by the United States, Mexico, and Cuba—connects with the Atlantic Ocean via the Straits of Florida and with the Caribbean Sea via the Yucatan Channel. It consists of a coastal shallow water zone, the continental shelf, the continental shelf break, and deep ocean regions. The circulation in the deep ocean is mainly controlled by the Loop Current, which enters the GOM via the Yucatan Channel from the Caribbean Sea and exits to the Atlantic Ocean (where it is called the Gulf Stream) via the Straits of Florida. In the coastal shallow water zone and over the continental shelf, the circulation is controlled by the combined impacts of the Loop Current, tides, surface winds, and surface heat fluxes. In the GOM coastal waters, estuaries, and bays, the circulation is also impacted by the freshwater inputs from rivers.

The northern GOM, defined as the model domain, extends from Panama City, FL (U.S.), in the east to Cabo Rojo, Veracruz (Mexico), in the southwest. The importance of developing an upgraded GOM Operational Forecast System (OFS) is demonstrated by looking at the following factors:

1. Based on annual loading tonnage in 2018, 6 of the top 10 largest United States ports are located in this region, including: the Port of South Louisiana, LA; the Port of Houston, TX; the Port of Beaumont, TX; the Port of Corpus Christi, TX; the Port of New Orleans, LA; and the Port of Baton Rouge, LA (Figure 1a). These ports play a critical role in the U.S. economy and are of critical importance to maintain commercial imports and exports.
2. A large hypoxic area (i.e., low dissolved oxygen with a value less than 2 milligrams per liter [mg/L]), or "Dead Zone" (Figure 1b), appears annually and occupies a portion of the northern GOM (Rabalais et al. 2002).
3. Many oil and gas rig platforms and pipelines are present (Figure 1c).
4. Historically, a large portion of category 4 and 5 hurricanes have made landfall (Figure 1d) throughout this region. The National Ocean Service (NOS) developed the Northern GOM OFS (NGOFS; Figure 2a) in April 2012 along with its 2 nested OFSs, the Northeastern GOM OFS (NEGOFS; Figure 2b) and the Northwestern GOM OFS (NWGOFS; Figure 2c) in September 2014. Because NEGOFS and NWGOFS were nested into NGOFS, their model runs were scheduled after the NGOFS run ended. This resulted in a longer time duration to complete all 3 OFS runs.

The 3 northern GOM OFSs (NGOFS, NEGOFS, and NWGOFS) ran 4 cycles daily; each cycle included a 6-hour nowcast and 54-hour (NGOFS) or 48-hour (NEGOFS and NWGOFS) forecasts. These northern GOM OFSs successfully ran for about 9 years (NGOFS) and 7 years (NEGOFS and NWGOFS), and their nowcast and forecast products provided important services to vessel and shipping navigation in ports and coastal waters, marine and sport fishermen, United States Coast Guard (USCG) search and rescue operations, and environmental research conducted by national and state agencies and academic institutions. However, the following disadvantages existed:

1. Some important water bodies were excluded, such as Lake Pontchartrain and Barataria Bay, leading to an overestimation of water levels under tropical storm or hurricane conditions.
2. The Mississippi River terminated at the coastline (near the Bird's Foot region), so water level conditions could not be provided along the river course from the mouth (Gulf coast) to important commercial ports located upstream of the Mississippi River system.
3. The Corpus Christi Bay and its intracoastal waterways were not included.
4. The Mexican coastal region, located to the south of Corpus Christi, was not included, inhibiting the ability to track harmful algal blooms that originated along the Mexican coast (Anderson et al. 2021).
5. The NEGOFS and NWGOFS were nested into NGOFS which introduced numerical errors induced by the boundary conditions.
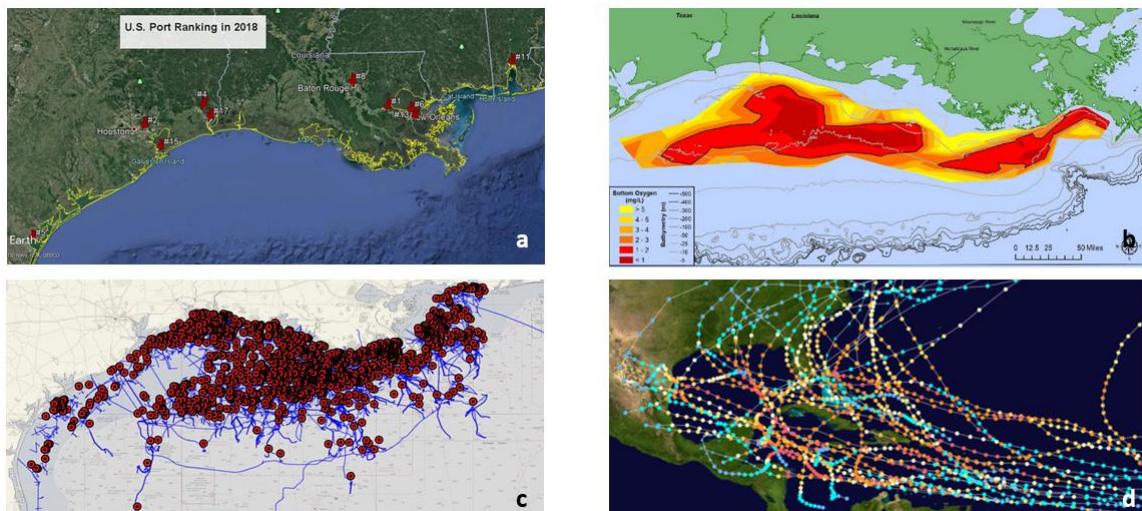
Figure 1. The northern Gulf of Mexico (GOM) domain with (a) important U.S. commercial port locations and their national ranking in annual loading tonnage in 2018; (b) bottom-water dissolved-oxygen concentration in 2019; (c) locations of oil and gas rig platforms and pipelines; and (d) tracks of historical Category 5 hurricanes that made landfall in the U.S.
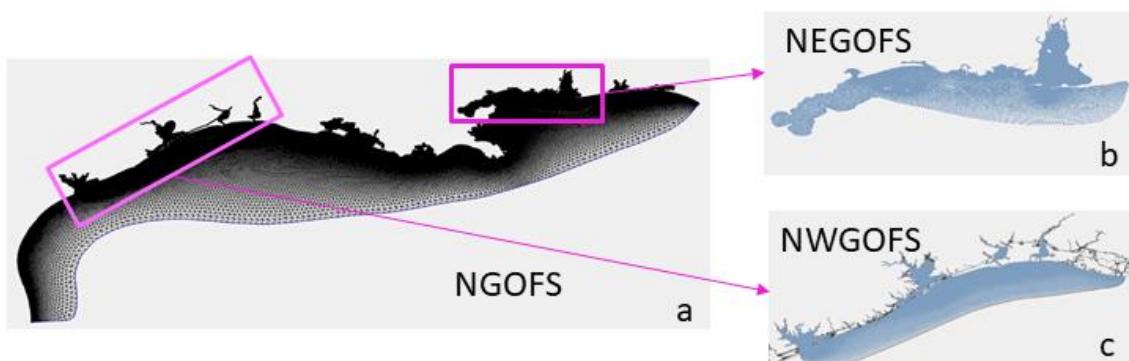
Figure 2. The 3 existing northern Gulf of Mexico (GOM) operational forecast system (OFS) model grids: (a) Northern Gulf of Mexico Observational Forecast System (NGOFS), (b) Northeastern Gulf of Mexico Operational Forecast System (NEGOFS), and (c) Northwestern Gulf of Mexico Operational Forecast System (NWGOFS).

Weighing the importance of the combined NGOFS system (outlined above) along with the disadvantages listed previously, the upgraded Northern GOM OFS (now referred to as NGOFS2)

model grid covers some important regions that were not included in the earlier NGOFS, NEGOFS, or NWGOFS model grids (Figure 3a). Figures 3b, 3c, and 3d are the zoomed-in views of the updated model grid focusing on the Lower Mississippi Port, Corpus Christi Bay, and Rollover Pass. These enlarged views show how well the model grid resolves complex curved coastlines, one of the advantages of an unstructured grid versus a structured grid. An additional improvement to the model grid is the significant improvement in grid cell configuration over the existing NGOFS, NEGOFS, and NWGOFS grids. The improvement in grid cell configuration can be seen in individual grid cells where the minimum interior triangular angle increased from 20 degrees to 35 degrees. This improvement in grid cell configuration results in increased model numerical stability. The NGOFS2 significantly reduces the total computer runtime of each cycle on the National Centers for Environmental Prediction (NCEP) High Performance Computing (HPC) Weather and Climate Operational Supercomputing System (WCOSS) from about 90 minutes (total computational wall-clock time to complete the 3 existing NGOFSs run) to 60 minutes. The post-processing time and the operation and maintenance workloads are reduced, as well.
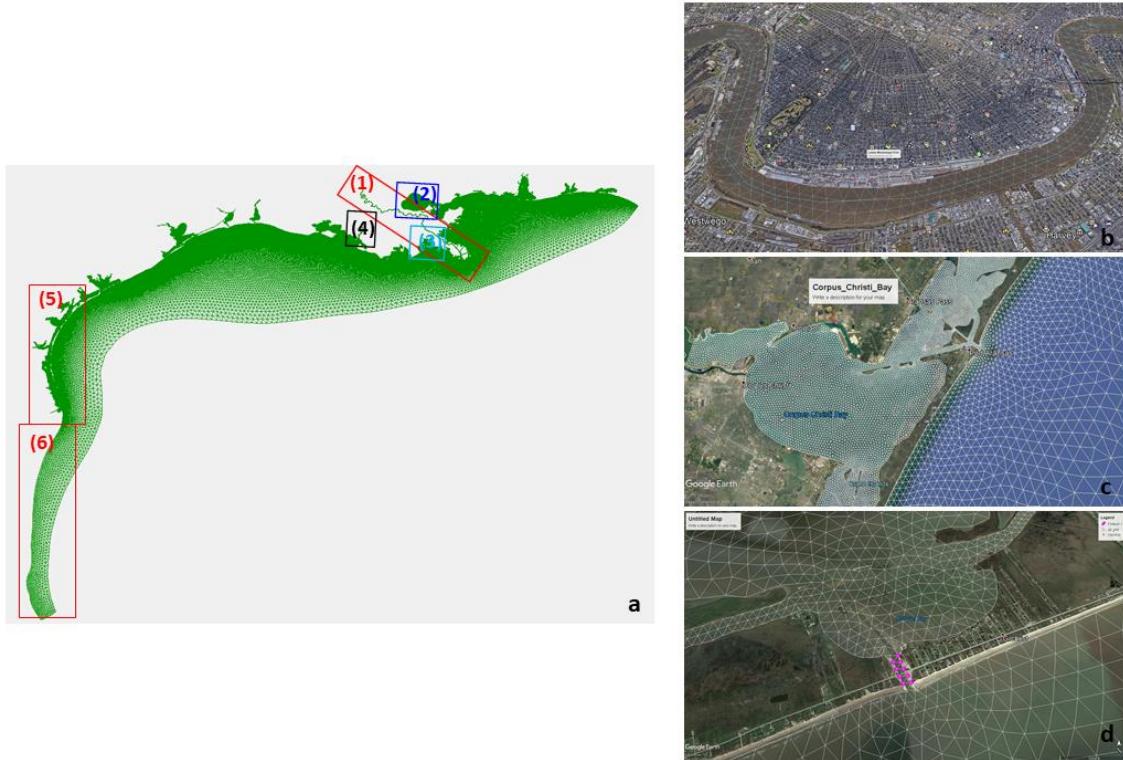
Figure 3. The upgraded Northern Gulf of Mexico Forecast System (NGOFS2) model grid (a) and zoomed-in views of model grid in the Lower Mississippi Port (b), Corpus Christi Bay (c), and Rollover Pass (d).

Based on NOS OFS development standard operating procedures, the NOS/Office of Coast Survey/Coast Survey Development Lab (CSDL) is responsible for the model grid generation. At this stage, the Center for Operational Oceanographic Products and Services (CO-OPS) developer should actively be involved and provide feedback on the model grid. CSDL is responsible for running tide simulations to determine the optimal model input tide harmonic constants along the open boundary. Prior to NGOFS2 going into semi-operational N/F mode, a 1-year-long (August 2, 2016, to approximately August 1, 2017) hindcast simulation (Yang et al. 2018) was performed. A hindcast simulation skill assessment was conducted, and the results demonstrated that the hindcast simulation root mean square errors (RMSE), averaged over the available observation stations, are about 0.07 m for water level, 1.1°C for temperature, 3.8 psu for salinity, and 0.19 m/s

for water current speed (Yang et al. 2022). After CSDL delivered the NGOFS2 model configuration, CO-OPS incorporated the NGOFS2 configuration into the NOS HPC-Coastal Ocean Modeling Framework (COMF; Zhang and Yang 2014) to run the model in N/F mode on WCOSS. NGOFS2 has run reliably with no instability issues since the semi-operational N/F runs started in May 2019. Semi-operational N/F simulation standard model skill assessment indicates that the RMSEs are less than 0.15 m for water level, 3ºC for temperature, 3.5 PSU for salinity, and 0.26 m/s for water current speed in a majority of the available observation stations.

Section 2 of this report documents the NGOFS2 N/F system model configuration; the control files and static files used in the HPC-COMF that supports NGOFS2 and other NOS N/F systems; and the generation of the model forcings that drive NGOFS2 N/F simulations. Section 3 describes the tide simulations. Comparison of skill assessments from NGOFS2 and combined NGOFS, NEGOFS, and NWGOFS, and from NGOFS2 N/F skill assessment conducted for the period of March 15, 2020 through March 15, 2021, are then presented in Section 4. Section 5 provides 2 NGOFS2 applications, followed by the conclusions in Section 6.

2. MODEL NOWCAST/FORECAST CONFIGURATION

This section describes 1) the Finite Volume Community Ocean Model (FVCOM), a community ocean model chosen as the core hydrodynamic model for NGOFS2 and the NGOFS2 model grid; 2) the surface meteorological forcing; 3) the lateral river forcing; 4) the open boundary conditions; and 5) the initial conditions for the NGOFS2 N/F simulation.

2.1 FVCOM Description

The FVCOM, one of the core hydrodynamic models used by the National Oceanic and Atmospheric Administration (NOAA)/NOS for operations, was originally developed by the University of Massachusetts at Dartmouth (Chen et al. 2003). FVCOM is a 3-dimensional (3-D), time- and density-dependent, prognostic primitive ocean circulation model. The version used in this project is Version 4.3. Turbulence parameterizations employ the Mellor and Yamada (1982) level 2½ turbulence closure sub-model as modified by Galperin et al. (1988) for flow-dependent vertical diffusive mixing coefficients and the Smagorinsky (1963) formulation for horizontal diffusive mixing coefficients. These equations are solved by using a second-order accurate finite-volume discretization scheme, which is the mass, momentum, energy, salt, and heat conservation locally and globally. FVCOM uses a mode-splitting method to solve the momentum equations with 2 distinct time steps, a smaller external mode time step and a larger internal mode time step—to accommodate the faster barotropic and slower baroclinic responses, respectively—to achieve higher computational efficiency. It also provides 2 heat flux algorithmic calculation options: Solar (SOLAR) and Coupled Ocean Atmosphere Response Experiment (COARE) version 2.6. SOLAR calculates the latent and sensible heat fluxes from bulk transfer equations, while COARE 2.6 enables the conversion from bulk to true skim temperature for calculating latent and sensible heat fluxes.

The model grid is designed as a generalized terrain-following coordinate transformation in the vertical to better represent irregular bathymetry and a non-overlapping unstructured triangular grid in the horizontal to accurately fit a complicated curved coastline, headlands, and infrastructures and to flexibly increase grid resolution in localized regions of interest. The resolution of the model grid increases from about 14 kilometers (km) along the open boundary to around 40 m to better resolve the narrow creeks and inlets that connect intracoastal waterways with their adjacent coasts. The entire model grid has 310,110 nodes and 580,371 triangular cells in the horizontal and 41 evenly distributed σ levels in the vertical. For the NGOFS2 project, the COARE version 2.6 algorithm was chosen.

FVCOM applications have been made for the deep ocean (e.g., Chen et al. 2009), the continental shelf (e.g., Chen et al. 2008; Zheng and Weisberg 2012), and for estuaries (e.g., Weisberg and Zheng 2006; Yang and Khangaonkar 2008; Zheng and Weisberg 2010) to study a wide range of research topics, including barotropic circulation, baroclinic circulation, and storm surge simulations (e.g., Weisberg and Zheng 2008).

2.2 Surface Meteorological Forcing

Meteorological forcing (variables including eastward and northward components of wind speed, surface heat flux, air pressure, air temperature, relative and specific humidity, and evaporation against precipitation) for NGOFS2 are generated by the HPC-COMF, similar to the other existing NOS OFSs. The input control file "**nos.ngofs2.ctl**" saved in the folder "**/fix/ngofs2/**" provides the options for which NOAA numerical weather prediction model outputs are used. For

NGOFS2, the North American Mesoscale Forecast System (NAM) with 12 km resolution is specified in the following 2 parameters in the input control file "**nos.ngofs2.ctl**":

export DBASE_MET_NOW=NAM
export DBASE_MET_FOR=NAM

These 2 parameters indicate that NAM is used to provide the nowcast and forecast meteorological forcing. This differs from the previously existing NGOFS, NEGOFS, and NWGOFS that used NAM4 (NAM with 4 km resolution) to provide the nowcast and forecast meteorological forcing because the NGOFS2 model domain is beyond the NAM4 model domain. The shell script "**nos_ofs_create_forcing_met.sh**" within "**/ush/**" can be launched to generate the N/F meteorological forcing files: "**nos.ngofs2.met.nowcast.yyyymmdd.tccz.nc**" and "**nos.ngofs2.met.forecast.yyyymmdd.tccz.nc**" (where yyyy, mm, dd, and cc in "tccz" are year, month, day, and cycle of the N/F, respectively). The required NAM model output files are saved in the NCEP HPC NAM production directory.

If the NAM model outputs are not available, or if they are not of sufficient duration to cover the nowcast and forecast period, the backup Global Forecast System with ¼ degree resolution (GFS25) saved on the NCEP HPC GFS production directory is used to generate the nowcast and forecast meteorological forcing.

2.3 Lateral River Forcing

Twenty-nine major rivers, canals, bayous, and creeks, all of which discharge fresh water into the model domain, are included in NGOFS2, and their locations are shown in Figure 4. Based on the river discharge rankings of U.S. river systems, these include the Mississippi River (1st), the Atchafalaya River (6th), and the Mobile River (13th). A majority of freshwater inputs into the Northern GOM coast generate multiple low salinity plumes, which dynamically contribute to 3-D coastal baroclinic circulations and vertical stratification. The recent discharge rates and water temperatures of each river can be retrieved directly from the WCOSS data tank. Table 1 provides the 29 U.S. Geological Survey (USGS) river and bayou identifications (IDs) and names. Table 2 provides part of the river control file "**nos.ngofs2.river.ctl**" that shows the names of the 29 rivers and the discharge scales of these rivers at their given grid points.
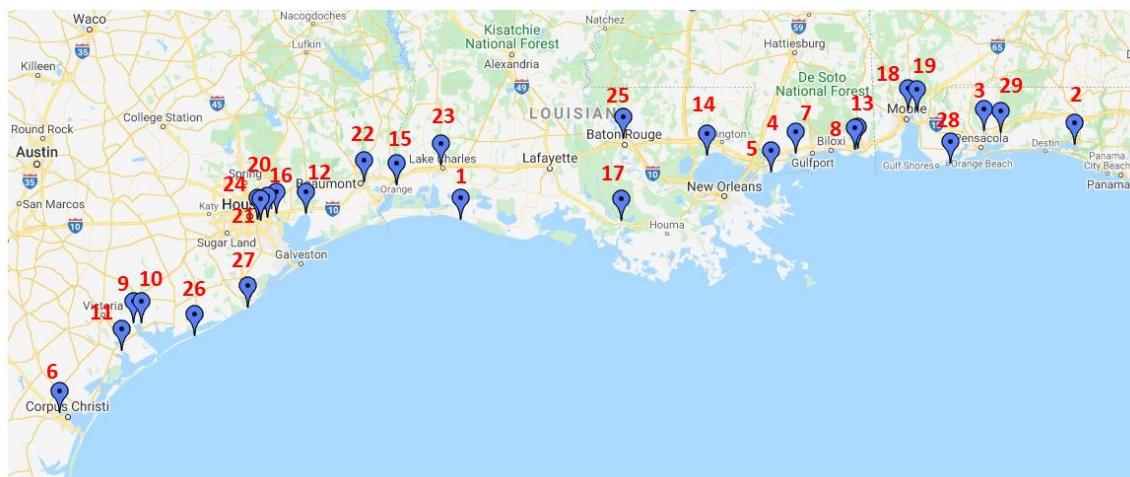
Figure 4. The upgraded Northern Gulf of Mexico Operational Forecast System (NGOFS2) river input locations. The numbers are the River IDs provided in Table 1.

Table 1. United States Geological Survey (USGS) river IDs and names.

No.	IDs	Station Names	No.	IDs	Station Names
1	08012000	Nezpique River near Basile, LA	16	08069000	Cypress Creek near Westfield, TX
2	02365500	Choctawhatchee River at Caryville, FL	17	07381600	Atchafalaya River near Morgan City, TX
3	02375500	Escambia River near Century, FL	18	02470629	Mobile River at Bucks, AL
4	02489500	Pearl River near Bogalusa, LA	19	02471019	Tensaw River near Mount Vernon, AL
5	02492000	Bogue Chitto River near Bush, LA	20	08076000	Greens Bayou near Houston, TX
6	08211200	Nueces River at Bluntzer, TX	21	08075400	Sims Bayou at Hiram Clarke St, Houston, TX
7	02481510	Wolf River Near Landon, MS	22	08041780	Neches River at Beaumont, TX
8	02479000	Pascagoula River at Merrill, MS	23	08015500	Calcasieu River near Kinder, LA
9	08164800	Placedo Creek near Placedo, TX	24	08075000	Brays Bayou at Houston, TX
10	08164000	Lavaca River near Edna, TX	25	07374000	Mississippi River at Baton Rouge, LA
11	08188800	Guadalupe River near Tivoli, TX	26	08162500	Colorado River near Bay City, TX
12	08066500	Trinity River at Romayor, TX	27	08116650	Brazos River near Rosharon, TX
13	02479560	Escatawpa River near Agricola, MS	28	02376500	Perdido River at Barrineau Park, FL
14	07375500	Tangipahoa River at Robert, LA	29	02368000	Yellow River at Milligan, FL
15	08030500	Sabine River near Ruliff, TX			

The USGS river data provide real-time observations (river flow and water temperature) that only cover the nowcast cycle. For the forecast cycle, the latest river observations persist for 48-hour duration of the cycle. The climatological river discharge and water temperature data (multiple-year daily mean from the USGS river database) are used when the real-time observations are not available for a given period of time. The climatological data for each river can be found in file "**nos.ofs.river.clim.usgs.nc**" that is saved in the "/**fix/share/**" directory.

Table 2 provides detailed information of the NGOFS2 river input. Section 1 of Table 2 provides the identification numbers (IDs) of the 46 rivers; the minimum, maximum, and long-term mean discharge rates; temperature; and river names. Section 2 provides the river IDs, river discharge and water temperature, and the scales of total discharge of the river distributed at the 63 grid nodes. River IDs 1 through 29 provide the river discharge rates. In terms of water temperature, only river IDs 17 and 25 have water temperature observation data. The river water temperatures for the other 27 rivers are from the river IDs 30 through 46 whose water temperature observation data are available in the WCOSS data tank. The river inputs from the 29 rivers are distributed across 63 model grid nodes, meaning that across some wider cross-section rivers, multiple grid nodes are required.

Table 2. The upgraded Northern Gulf of Mexico Operational Forecast System (NGOFS2) river control file "**nos.ngofs2.river.ctl**".

Section 1: Information about United States Geological Survey (USGS) rivers where real-time discharges are available.

River ID	Station ID	NWS ID	Agency ID	Q min	Q max	Q mean	T min	T max	T mean	Q Flag	TS Flag	River Name
1	08012000	XXXXX	USGS	0.1	260.8	23.5	5.0	34.0	22.0	1	0	Nezpique River
2	02365500	XXXXX	USGS	14.3	827.2	153.5	5.0	34.0	22.0	1	0	Choctawhatchee River
3	02375500	XXXXX	USGS	12.8	930.6	166.0	5.0	34.0	22.0	1	0	Escambia River
4	02489500	XXXXX	USGS	29.2	1906.9	281.9	5.0	34.0	22.0	1	0	Pearl River
5	02492000	XXXXX	USGS	10.5	414.9	56.5	5.0	34.0	22.0	1	0	Bogue Chitto River
6	08211200	XXXXX	USGS	0.1	35.5	10.0	5.0	34.0	22.0	1	0	Nueces River
7	02481510	XXXXX	USGS	0.4	85.2	17.2	5.0	34.0	22.0	1	0	Wolf River
8	02479000	XXXXX	USGS	1.8	368.6	35.5	5.0	34.0	22.0	1	0	Pascagoula River
9	08164800	XXXXX	USGS	0.0	518.2	10.2	5.0	34.0	22.0	1	0	Placedo Creek
10	08164000	XXXXX	USGS	1.0	2103.9	18.7	5.0	34.0	22.0	1	0	Lavaca River
11	08188800	XXXXX	USGS	1.0	93.4	28.6	5.0	34.0	22.0	1	0	Guadalupe River
12	08066500	XXXXX	USGS	2.9	1862.1	224.1	5.0	34.0	22.0	1	0	Trinity River
13	02479560	XXXXX	USGS	5.7	1025.1	30.3	5.0	34.0	22.0	1	0	Escatawpa River
14	07375500	XXXXX	USGS	6.6	249.7	32.5	5.0	34.0	22.0	1	0	Tangipahoa River
15	08030500	XXXXX	USGS	7.9	1366.8	224.3	5.0	34.0	22.0	1	0	Sabine River
16	08069000	XXXXX	USGS	1.0	892.0	10.4	5.0	34.0	22.0	1	0	Cypress Creek
17	07381600	XXXXX	USGS	203.0	14498.0	3560.1	5.0	34.0	22.0	1	0	Atchafalaya River
18	02470629	XXXXX	USGS	10.0	1653.0	700.5	5.0	34.0	22.0	1	0	Mobile River
19	02471019	XXXXX	USGS	10.0	1584.4	619.2	5.0	34.0	22.0	1	0	Tensaw River
20	08076000	XXXXX	USGS	0.8	750.4	5.0	5.0	34.0	22.0	1	0	Greens Bayou
21	08075400	XXXXX	USGS	0.1	382.3	2.3	5.0	34.0	22.0	1	0	Sims Bayou
22	08041780	XXXXX	USGS	61.2	2155.0	188.1	5.0	34.0	22.0	1	0	Neches River
23	08015500	XXXXX	USGS	3.6	1031.2	73.5	5.0	34.0	22.0	1	0	Calcasieu River
24	08075000	XXXXX	USGS	2.5	993.9	9.3	5.0	34.0	22.0	1	0	Brays Bayou
25	07374000	XXXXX	USGS	4250.0	40663.0	15499.0	5.0	32.0	21.0	1	0	Mississippi River
26	08162500	XXXXX	USGS	0.0	1195.9	74.0	5.0	34.0	22.0	1	0	Colorado River
27	08116650	XXXXX	USGS	0.8	1999.6	237.7	5.0	34.0	22.0	1	0	Brazos River
28	02376500	XXXXX	USGS	4.8	90.1	22.2	5.0	34.0	22.0	1	0	Perdido River
29	02368000	XXXXX	USGS	3.5	186.4	32.8	5.0	34.0	22.0	1	0	Yellow River
30	08017044	XXXXX	USGS	-9999.0	9999.0	9999.0	5.0	33.0	22.2	3	1	Calcasieu River I-10
31	8729840	PCLF1	COOPS	-9999.0	9999.0	9999.0	5.0	34.0	22.5	3	1	Pensacola
32	8747437	WYCM6	COOPS	-9999.0	9999.0	9999.0	5.0	33.0	22.5	3	1	Bay Waveland
33	302318088512600	XXXXX	USGS	-9999.0	9999.0	9999.0	5.0	33.0	22.5	3	1	Biloxi Bay
34	8773259	VACT2	COOPS	-9999.0	9999.0	9999.0	5.0	33.0	22.5	3	1	Port Lavaca
35	8773037	SDRT2	COOPS	-9999.0	9999.0	9999.0	5.0	34.0	22.5	3	1	Seadrift

36	08067100	XXXXX	USGS	-9999.0	9999.0	9999.0	5.0	34.0	22.1	3	1	Trinity River
37	301849088350000	XXXXX	USGS	-9999.0	9999.0	9999.0	5.0	33.0	22.5	3	1	Round Island Light
38	301001089442600	XXXXX	USGS	-9999.0	9999.0	9999.0	5.0	33.0	22.5	3	1	Rigolets
39	8770570	SBPT2	COOPS	-9999.0	9999.0	9999.0	5.0	34.0	22.5	3	1	Sabine Pass
40	8770777	NCHT2	COOPS	-9999.0	9999.0	9999.0	5.0	34.0	22.5	3	1	Manchester
41	8737048	OBLA1	COOPS	-9999.0	9999.0	9999.0	5.0	34.0	22.5	3	1	Mobile State Dock
42	8767961	BKTL1	COOPS	-9999.0	9999.0	9999.0	5.0	34.0	22.5	3	1	Lake Charles
43	02480285	XXXXX	USGS	-9999.0	9999.0	9999.0	5.0	35.0	22.2	3	1	Pascagoula River
44	8772471	FPST2	COOPS	-9999.0	9999.0	9999.0	5.0	33.0	22.5	3	1	Freeport SPIP
45	8775244	NUET2	COOPS	-9999.0	9999.0	9999.0	5.0	33.0	22.5	3	1	Nueces Bay
46	8764044	TESL1	COOPS	-9999.0	9999.0	9999.0	5.0	33.0	22.5	3	1	Atchafalaya River

Section 2: Information of Finite Volume Community Ocean Model (FVCOM) grids/locations to specify river inputs.

GRID ID	Node ID	Cell ID	Dir	Flag	River ID Q	Q Scale	River ID T	T Scale	River Basin Name
1	105200	1	0	3	1	1.00	30	1.0	Nezpique River, LA
2	139937	2	0	3	2	1.00	31	1.0	Choctawhatchee River, FL
3	141598	3	0	3	3	1.00	31	1.0	Escambia River, FL
4	208416	4	0	3	4	1.00	32	1.0	Pearl River, LA
5	209271	5	0	3	5	1.00	32	1.0	Bogue Chitto River, LA
6	215128	6	0	3	6	0.34	45	1.0	Nueces River, TX
7	215129	7	0	3	6	0.33	45	1.0	Nueces River, TX
8	216020	8	0	3	6	0.33	45	1.0	Nueces River, TX
9	228316	9	0	3	7	0.33	32	1.0	Wolf River, MS
10	228317	10	0	3	7	0.34	32	1.0	Wolf River, MS
11	228318	11	0	3	7	0.38	32	1.0	Wolf River, MS
12	231177	12	0	3	8	0.25	33	1.0	Pascagoula River, MS
13	231856	13	0	3	8	0.25	33	1.0	Pascagoula River, MS
14	231857	14	0	3	8	0.25	33	1.0	Pascagoula River, MS
15	231858	15	0	3	8	0.25	33	1.0	Pascagoula River, MS
16	235637	16	0	3	9	0.50	34	1.0	Placedo Creek, TX
17	235638	17	0	3	9	0.50	34	1.0	Placedo Creek, TX
18	239268	18	0	3	10	0.50	34	1.0	Lavaca River, TX
19	239269	19	0	3	10	0.50	34	1.0	Lavaca River, TX
20	252123	20	0	3	11	0.33	35	1.0	Guadalupe River, TX
21	252823	21	0	3	11	0.34	35	1.0	Guadalupe River, TX
22	253513	22	0	3	11	0.33	35	1.0	Guadalupe River, TX
23	253719	23	0	3	12	0.50	36	1.0	Trinity River, TX
24	258786	24	0	3	12	0.50	36	1.0	Trinity River, TX

25	253266	25	0	3	13	0.25	37	1.0	Escatawpa River, MS
26	253957	26	0	3	13	0.25	37	1.0	Escatawpa River, MS
27	253958	27	0	3	13	0.25	37	1.0	Escatawpa River, MS
28	253959	28	0	3	13	0.25	37	1.0	Escatawpa River, MS
29	286141	29	0	3	14	0.50	38	1.0	Tangipahoa River, LA
30	286355	30	0	3	14	0.50	38	1.0	Tangipahoa River, LA
31	291165	31	0	3	15	0.50	39	1.0	Sabine River, TX
32	291322	32	0	3	15	0.50	39	1.0	Sabine River, TX
33	293704	33	0	3	16	0.33	40	1.0	Cypress Creek, TX
34	293705	34	0	3	16	0.34	40	1.0	Cypress Creek, TX
35	293706	35	0	3	16	0.33	40	1.0	Cypress Creek, TX
36	294544	36	0	3	17	0.075	17	1.0	Atchafalaya River at Morgan City, TX
37	294545	37	0	3	17	0.075	17	1.0	Atchafalaya River at Morgan City, TX
38	294546	38	0	3	17	0.075	17	1.0	Atchafalaya River at Morgan City, TX
39	294547	39	0	3	17	0.075	17	1.0	Atchafalaya River at Morgan City, TX
40	295329	40	0	3	18	0.25	41	1.0	Mobile River, AL
41	295330	41	0	3	18	0.25	41	1.0	Mobile River, AL
42	295331	42	0	3	18	0.25	41	1.0	Mobile River, AL
43	295332	43	0	3	18	0.25	41	1.0	Mobile River, AL
44	295621	44	0	3	19	0.20	41	1.0	Tensaw River, AL
45	295622	45	0	3	19	0.20	41	1.0	Tensaw River, AL
46	295662	46	0	3	19	0.20	41	1.0	Tensaw River, AL
47	295663	47	0	3	19	0.20	41	1.0	Tensaw River, AL
48	295664	48	0	3	19	0.20	41	1.0	Tensaw River, AL
49	296128	49	0	3	20	0.50	34	1.0	Greens Bayou, TX
50	296158	50	0	3	20	0.50	34	1.0	Greens Bayou, TX
51	298669	51	0	3	21	1.00	40	1.0	Sims Bayou, TX
52	298897	52	0	3	22	1.00	39	1.0	Neches River, TX
53	298922	53	0	3	23	1.00	42	1.0	Calcasieu River, LA
54	299069	54	0	3	24	0.50	40	1.0	Brays Bayou, TX
55	299070	55	0	3	24	0.50	40	1.0	Brays Bayou, TX
56	303711	56	0	3	25	0.15	25	1.0	Mississippi River at Baton Rouge, LA
57	303712	57	0	3	25	0.15	25	1.0	Mississippi River at Baton Rouge, LA
58	303713	58	0	3	25	0.15	25	1.0	Mississippi River at Baton Rouge, LA
59	303714	59	0	3	25	0.15	25	1.0	Mississippi River at Baton Rouge, LA
60	51450	60	0	3	26	1.00	44	1.0	Colorado River, TX
61	51496	61	0	3	27	1.00	44	1.0	Brazos River, TX
62	52850	62	0	3	28	1.00	43	1.0	Perdido River, FL

63	156173	63	0	3	29	1.00	31	1.0	Yellow River, FL

River ID: Serial Identification number of USGS River.

Station ID: River Identification number.

NWS ID: National Weather Service (NWS) Identification number for USGS river.

Agency ID: Station owner agency name.

Node/Cell ID: Serial Identification number for model grid location to specify river input.

Flag: River runoff trace flag, 0: all tracers (T & S) are off; 1: only T is on; 2: only S is on; 3: both T and S are on.

River ID Q: River ID in Section 1 which is used to specify river discharge at the corresponding model grid.

River ID T: River ID in Section 1 which is used to specify river temperature at the corresponding model grid.

Q Scale: Scaling factor of river discharge at corresponding model grid.

T Scale: Scaling factor of river temperature at corresponding model grid.

Q min: Minimum discharge value of the river.

Q mean: Average discharge value of the river.

Q max: Maximum discharge value of the river.

T min: Minimum discharge value of the temperature.

T mean: Average discharge value of the temperature.

T max: Maximum discharge value of the temperature.

Q Flag: 0: Use climatological river discharges data (daily mean).

    1: Use real-time river discharge observations.

    2: Use stage height, have to modify source code to use the provided formula to convert stage height into discharge.

  >=3: Discharge at the river is not used, river is for T and S.

TS Flag: 0: Use climatological temperature data (daily mean).

    1: Use real-time river temperature observations.

River Basin Name: Name of rivers or river basins.

2.4 Open Boundary Conditions

The NGOFS2 model configuration uses the nesting option, which is available within FVCOM. Ideally, an operational outer model with tidal and non-tidal water levels, 3-D currents, salinity, and water temperature output would be available to provide the open boundary conditions for the inner model (NGOFS2). Unfortunately, this kind of outer model does not exist in the northern GOM. Therefore, for NGOFS2, the 3-D profiles of currents, salinities, and temperatures along the open boundary are bicubically interpolated from the outer model, NOAA's Global Real-Time Ocean Forecast System (G-RTOFS; Mehra et al. 2015; Garaffo et al. 2016). For water levels, the forcing data include both the tidal and non-tidal components. Eight major tidal constituents (M_2, S_2, K_1, O_1, N_2, K_2, P_1, and Q_1) are considered, and their harmonic constants are interpolated from the ADvanced CIRCulation model (ADCIRC) East Coast 2015 (EC2015) tidal database (Szpilka et al. 2016). These harmonic constants are adjusted slightly to obtain the optimal model-data tidal harmonic constant comparisons at 100 water level stations spanning the entire NGOFS2 coast with the exception of the Mexican portion of the coast. The details of the open boundary tidal harmonic constants are provided in Yang et al. (2022). The non-tidal water levels along the open boundary are bicubically interpolated from G-RTOFS water level outputs. The total water levels along the open boundary are the sum of the tidal and non-tidal water levels, which excludes the non-linear interactions between tides and between tidal and non-tidal components. It should also be noted that along the open boundary, the water levels include tidal variations, whereas currents (2-D and 3-D), 3-D salinities, and water temperatures do not. This leads to a potential inconsistency between water levels and currents. Because the open boundary is located at far offshore and deep-water regions, the impact of this inconsistency on the model simulation in the coastal regions is minor and can be neglected.

The Fortran code "**nos_ofs_create_forcing_obc_fvcom.f**" saved in the COMF package generates the FVCOM-based OFS open boundary forcing file. The outer model selections for nowcast and forecast cycles are provided in the input control file "**nos.ngofs2.ctl**":

export DBASE_WL_NOW=RTOFS For nowcast water level and current
export DBASE_WL_FOR=RTOFS For forecast water level and current
export DBASE_TS_NOW=RTOFS For nowcast salinity and temperature
export DBASE_TS_FOR=RTOFS For forecast salinity and temperature

If the G-RTOFS files are not available, the Extratropical Storm Surge (ETSS) operational forecast product is the backup for non-tidal water levels and Navy Global Hybrid Coordinate Ocean Model (HYCOM) is the backup for 3-D currents, salinities, and temperatures. The output of the Fortran code "**nos_ofs_create_forcing_obc_fvcom.f**" is the open boundary forcing file "**nos.ngofs2.obc.yyyymmdd.tccz.nc**".

2.5 Initial Conditions

In COMF, the Fortran code "**nos_ofs_read_restart_fvcom.f**" is used to read the FVCOM-based OFS initial/restart file. If the values and attributes of the variable "time" are correct, then the initial file is not changed. Otherwise, the following actions may be taken, if needed:

1. Change the reference time (the attribute of "units" in the initial NetCDF file) of variables "time," "Itime," "Itime2," and "Times" in the initial file if the reference

time is different from ${BASE_DATE} specified in the input control file "**nos.ngofs2.ctl**".

2. Recompute the values of variables "time," "Itime," "Itime2," and "Times" to correspond to ${BASE_DATE} as the reference time in the initial file if (1) is conducted.

3. If the "time" is more than 48 hours prior to ${time_nowcastend}, then the nowcast cycle is terminated. The simulation will begin from a cold start in which the water level and current velocity are specified as zeroes and the climatological water temperature and salinity are specified as the initial conditions.

For additional information, refer to Zhang and Yang (2014).

In the case of NGOFS2, the output restart file from the nowcast of the last cycle is used to generate the initial condition for the nowcast of the current cycle. For example, "**nos.ngofs2.rst.nowcast.yyyymmdd.t00z.nc**" from the nowcast at 00z cycle will be renamed to "**nos.ngofs2.init.nowcast.yyyymmdd.t06z.nc**" for the nowcast at 06z cycle. The restart file from the 06z cycle nowcast (**nos.ngofs2.rst.nowcast.yyyymmdd.t06z.nc**) will be used for the 06z forecast cycle and t12z nowcast cycle, etc.

3. TIDE SIMULATION

Before the skill assessments of NGOFS2 N/F runs are conducted, it is useful to evaluate the NGOFS2 tide simulation performance. The details of the NGOFS2 tide simulation configurations can be found in Yang et al. (2022), and only the results therein are provided here.

The NGOFS2 tide simulation was run for 200 days, and hourly outputs at selected stations were saved for the purpose of harmonic analysis. By considering the model ramp-up requirement, the first 15 days of model output are discarded and the remaining 185 days outputs are used for harmonic analysis to provide the reliable harmonic constants. Harmonic constants (amplitudes and phases) were collected at 100 tide gauge stations and compared with the harmonic constants analyzed from NGOFS2 tide simulation. Figures 5 and 6 show the model-data harmonic constants (amplitude and phase) comparison for four major tidal constituents (K_1, O_1, P_1, and M_2) in this region. For the 100 stations, the averages of absolute model-data differences of the amplitudes are 1.5, 1.5, 1.1, and 1.8 centimeters (cm) and phases are 10.4, 9.5, 15.0, 20.8 degrees for K_1, O_1, P_1, and M_2 tidal constituents, respectively. These results demonstrate that the NGOFS2 tidal simulation is robust.
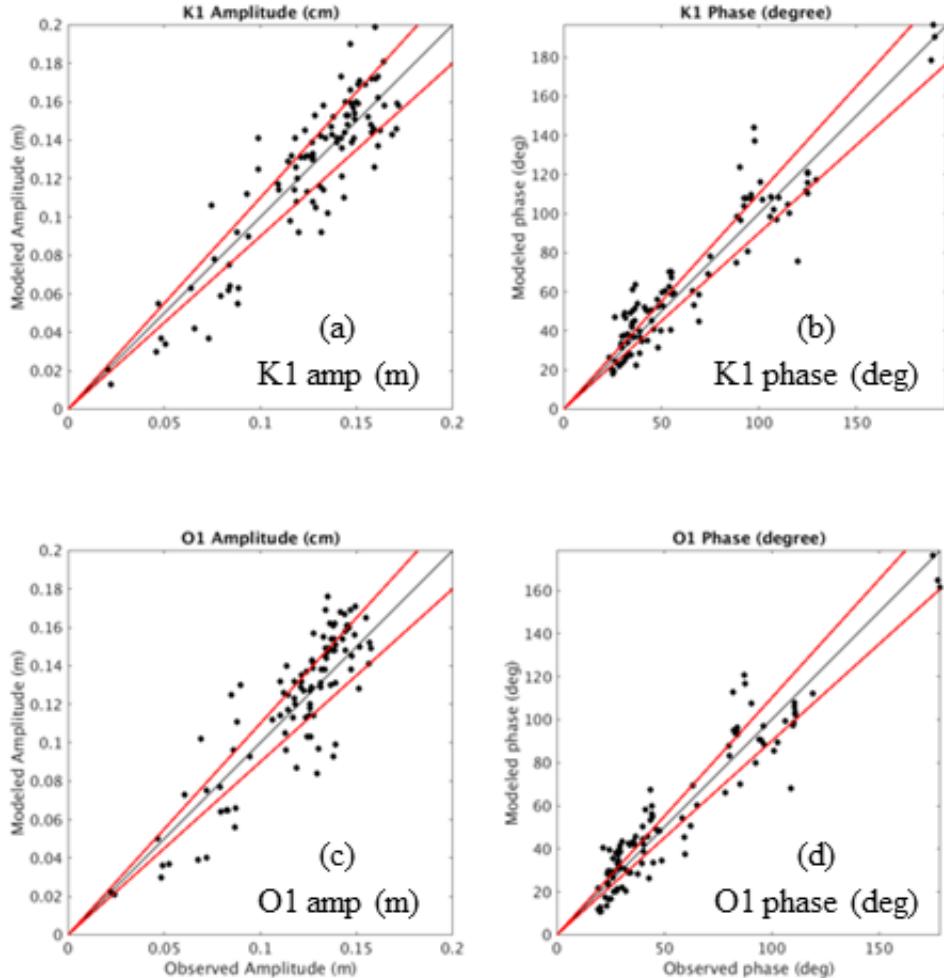
Figure 5. Model-data harmonic constants (amplitude: left panels; phase: right panels) comparisons for K_1 (upper panels) and O_1 (lower panels) tidal constituents. The red lines are the 10% deviation from the perfect model-data match.

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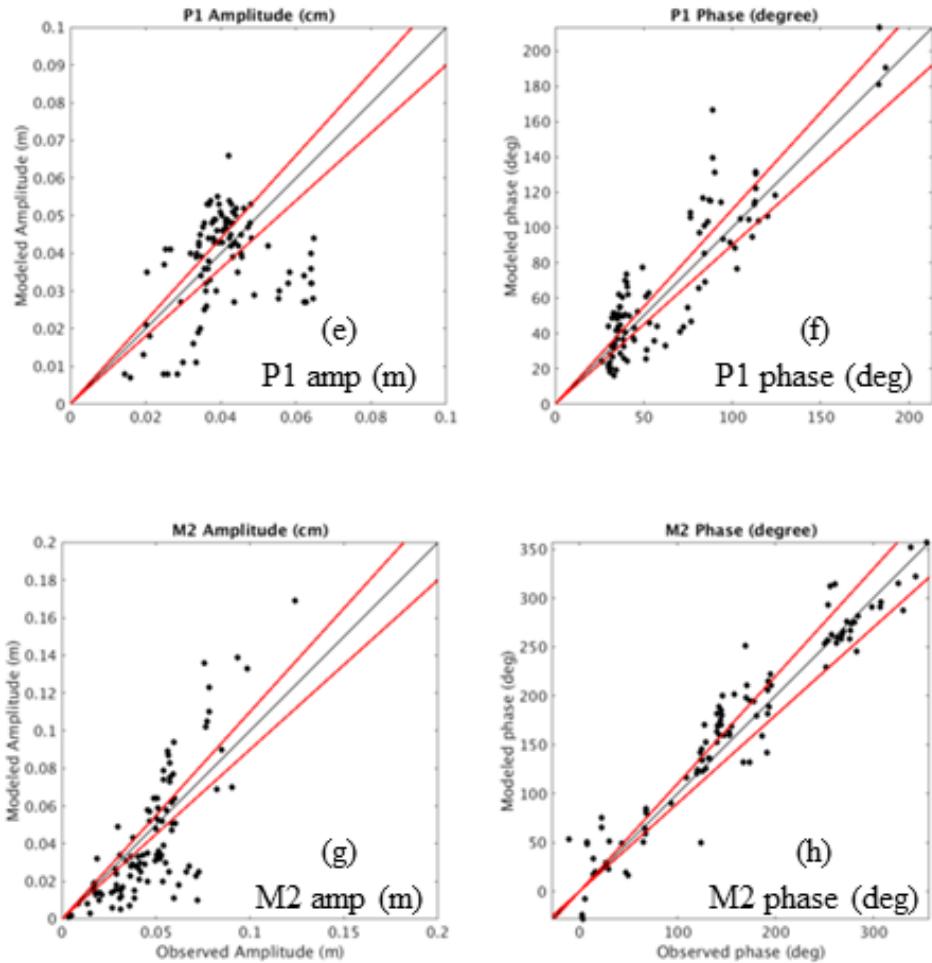
Figure 6. Model-data harmonic constants (amplitude: left panels; phase: right panels) comparisons for P_1 (upper panels) and M_2 (lower panels) tidal constituents. The red lines are the 10% deviation from the perfect model-data match.

4. NOWCAST/FORECAST SKILL ASSESSMENTS

NGOFS2 quasi-operational runs began in May 2019. In July 2020, the NGOFS2 science briefing to the NCEP director and key NGOFS2 stakeholders was given and approved for implementation on WCOSS. NGOFS2 went into operation in March 2021. The model runs 4 cycles (03, 09, 15, and 21) per day, and each cycle includes a 6-hour nowcast and 48-hour forecast. Model outputs include the variables of water level, 3-D current velocity, salinity, and temperature with 3 types of products: a) station files with a 6-minute interval; b) surface "2ds" files with an hourly interval; and c) 3-D fields files with a 3-hour interval. Before the skill assessments of NGOFS2 N/F runs are presented, Section 4.1 describes the comparisons of NGOFS2 nowcasts with real-time water levels, near-surface temperatures, salinities, and currents, and Section 4.2 compares the performances between NGOFS and NGOFS2. Section 4.3 briefly reviews the basics of skill assessment statistics used in this report, followed by the results of the NGOFS2 N/F skill assessments in Section 4.4.

4.1 Nowcast and Forecast Products

The latest cycle's N/F simulation results are presented on the NGOFS2 operational website (https://tidesandcurrents.noaa.gov/ofs/ngofs2/ngofs2.html) as shown in Figure 7. There exist 2 color pins (blue and red) on the website. When clicking one of the blue pins, a new website for the corresponding subdomain pops up. Figure 8 shows an example of the Mobile Bay subdomain (https://tidesandcurrents.noaa.gov/ofs/ngofs2/ngofs_mobile.html). When clicking one of the red pins, it will show the time series of NGOFS2 N/F simulated water level (Figure 9), near-surface water temperature (Figure 10), near-surface water salinity (Figure 11), near-surface current speed and direction (Figure 12), and model input wind vectors at that station location. The red crosses (x) shown in Figures 9-12 are the observation data at the station if they are available. Figures 9-12 indicate that the NGOFS2 model simulation generally agrees with observations of water levels, near-surface water currents, temperatures, and salinities in nowcast and forecast time windows at most of the stations where measurements are available.
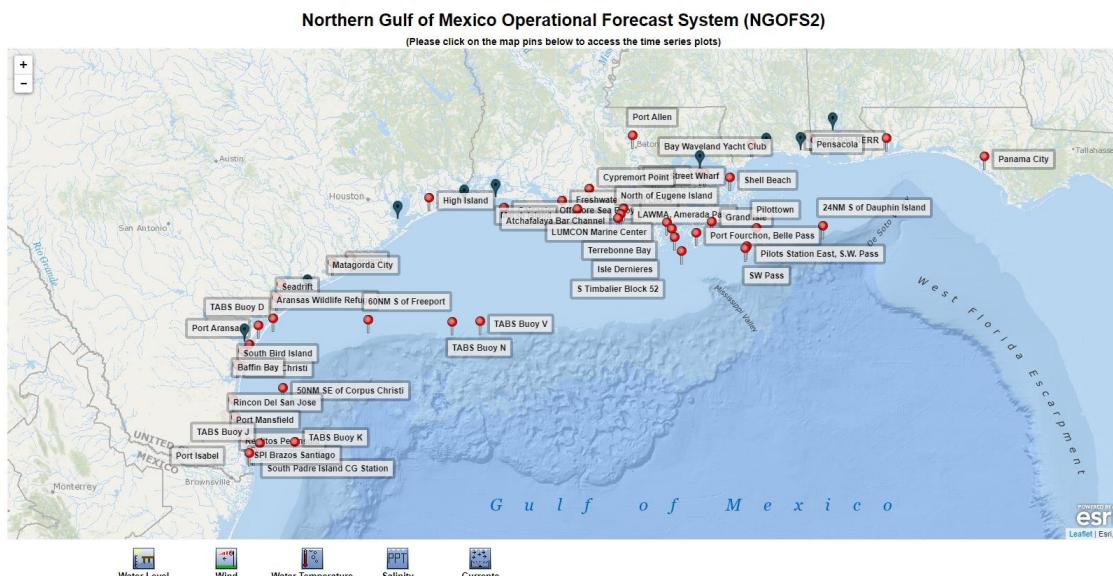
Figure 7. Screenshot of the upgraded Northern Gulf of Mexico Operational Forecast System (NGOFS2) website. The red pins are station locations. The blue pins link to the 9 subdomain links.

NGOFS2 - Mobile Bay
(Please click on the map pins below to access the time series plots)

Water Level Wind Water Temperature Salinity Currents
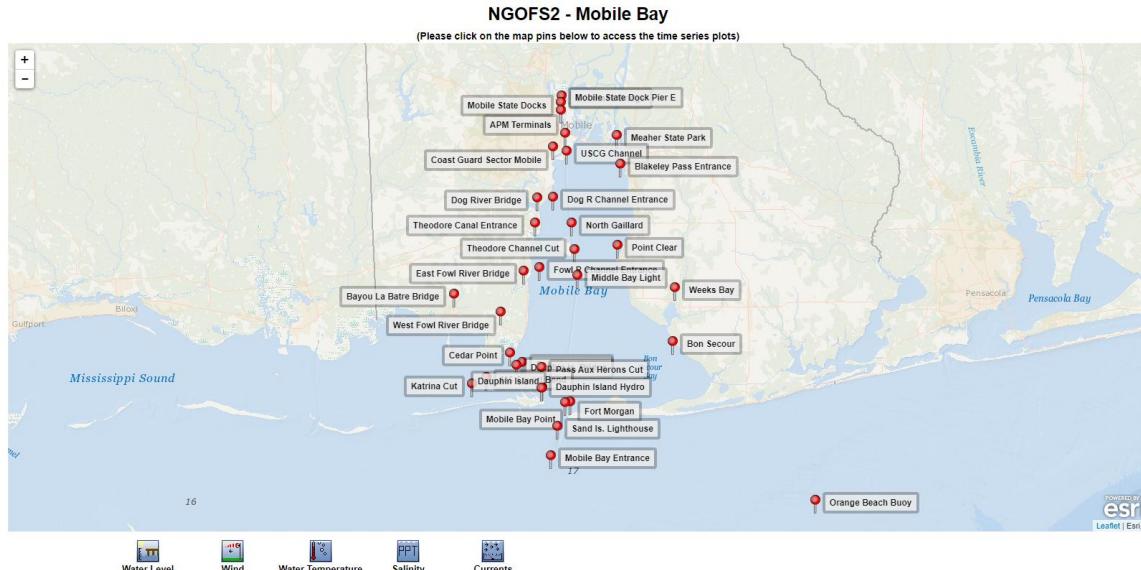
Figure 8. Screenshot of the upgraded Northern Gulf of Mexico Operational Forecast System (NGOFS2) Mobile Bay subdomain website. The red pins are station locations in this subdomain.

NOAA/National Ocean Service
Northern Gulf of Mexico
Operational Forecast System (NGOFS2)

Observation: ×××××××
Nowcast: ·—··—··—·—
Forecast Guidance: ————
Tidal Prediction: ·········

Grand Isle, LA Water Levels
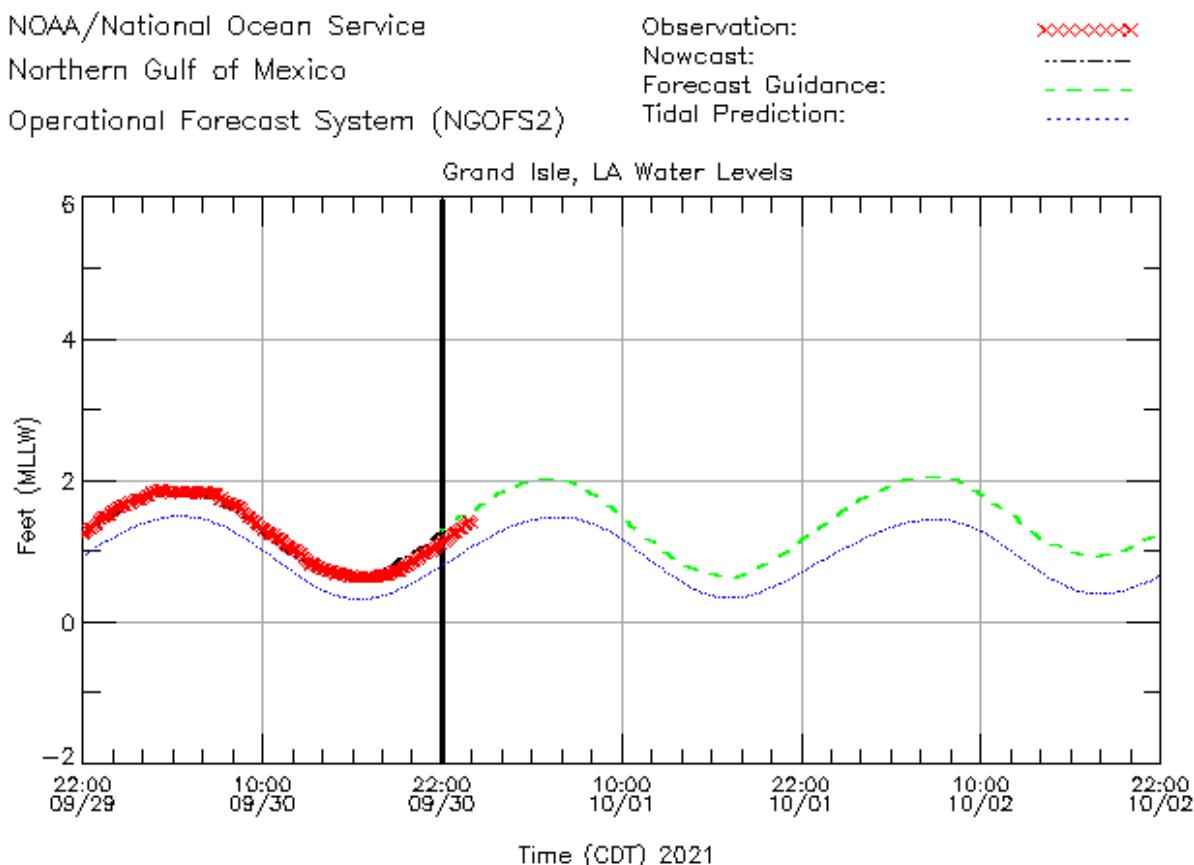
Figure 9. Example of water level nowcast (black dashed line) and forecast (green dashed line) output at Grand Isle, LA, National Water Level Observation Network (NWLON) station from September 29-October 2, 2021. The blue dashed line represents tidal prediction. The red crosses are observations.
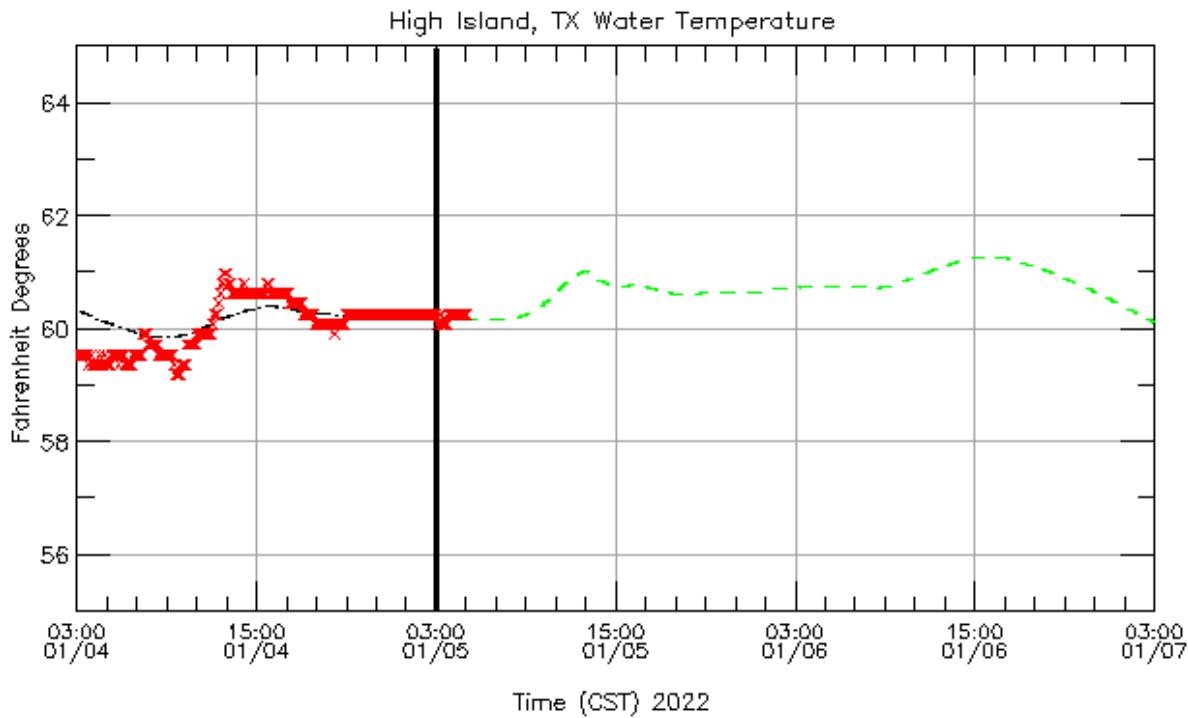
Figure 10. Example of near-surface water temperature nowcast (black dashed line) and forecast (green dashed line) output at High Island station, TX, from January 4-January 7, 2022. The red crosses are observations.
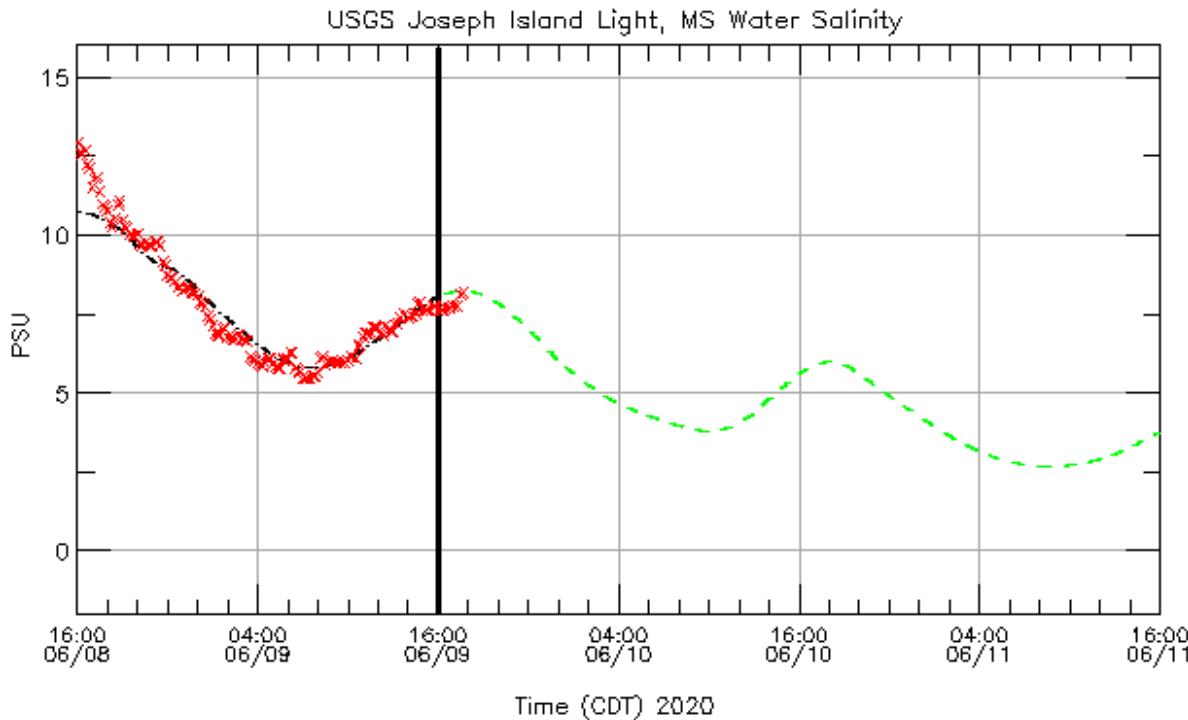
Figure 11. Example of near-surface water salinity nowcast (black dashed line) and forecast (green dashed line) output at United States Geological Survey (USGS) Joseph Island Light station, MS, from June 8-June 11, 2021. The red crosses are observations.

Figure 12. Example of near-surface water current speed (upper panel) and direction (lower panel) nowcast (black dashed line) and forecast (green dashed line) output at Port Aransas station, TX, from September 30-October 2, 2021. The red crosses are observations.

4.2 Skill Assessment Software System

Skill assessment is a statistical measurement of the model performance when systematically comparing model simulations with observations. NOS skill assessment criteria were created to evaluate the model simulation performance (Hess et al. 2003), and a software package was subsequently developed to compute these statistical merits (Zhang et al. 2006). The software computes the skill assessment scores automatically using files containing observations and N/F model results. A standard suite of skill assessment statistics is provided in Table 3.

Table 3. Skill assessment statistics.

Variable	Explanation
Error	The error is defined as the model predicted value p, minus the reference (observed or astronomical tide value) r: $e_i = p_i - r_i$.
SM	Series Mean. The mean value of a series y. Calculated as: $\underline{y} = \frac{1}{N}\sum_{i=1}^{N} y_i$.
RMSE	Root Mean Square Error. Calculated as: $RMSE = \sqrt{\frac{1}{N}\sum_{i=1}^{N} e_i^2}$.
SD	Standard Deviation. Calculated as: $SD = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}\left(e_i - \underline{e}\right)^2}$.
CF(X)	Central Frequency. Fraction (percentage) of errors that lie within the limits $\pm$X.
POF(X)	Positive Outlier Frequency. Fraction (percentage) of errors that are greater than X.
NOF(X)	Negative Outlier Frequency. Fraction (percentage) of errors that are less than X.
MDPO(X)	Maximum Duration of Positive Outliers. A positive outlier event is 2 or more consecutive occurrences of an error greater than X. MDPO is the length of time (based on the number of consecutive occurrences) of the longest event.
MDNO(X)	Maximum Duration of Negative Outliers. A negative outlier event is 2 or more consecutive occurrences of an error less than -X. MDNO is the length of time (based on the number of consecutive occurrences) of the longest event.
WOF(X)	Worst Case Outlier Frequency. Fraction (percentage) of errors that, given an error of magnitude exceeding X, either (1) the simulated value of water level is greater than the astronomical tide and the observed value is less than the astronomical tide, or (2) the simulated value of water level is less than the astronomical tide and observed value is greater than the astronomical tide.

The target frequencies of the associated statistics based on navigation requirements are:

CF(X) $\geq$90%, POF(2X) $\leq$1%, NOF(2X) $\leq$1%, MDPO(2X) $\leq$ N, MDNO(2X) $\leq$ N

The NOS-accepted error criteria (X) are 0.15 m for water level, 3.0°C for water temperature, 3.5 psu for water salinity, and 0.26 m/s for surface currents (Zhang et al. 2006). The accepted N (duration) is 24 hours.

4.3 Comparisons of NGOFS and NGOFS2 Performances

Before the skill assessment statistics of NGOFS2 N/F simulations are presented, it is useful to compare the performances of NGOFS and NGOFS2, although it is not expected that there is a significant difference between them. To make the comparison more realistic and comparable, the observation data and outputs of NGOFS and NGOFS2 were collected in the same period of time (03/15/2020-03/15/2021) and the NOS standard skill assessment software (Zhang et al. 2006) was used to calculate the RMSEs from NGOFS and NGOFS2 simulations and observed data. Figure 13 shows the comparisons of RMSEs of NGOFS and NGOFS2 for water levels at 36 National Water Level Observation Network (NWLON) stations, water temperature at 34 stations, water salinity at 16 stations, and water current speed at 7 stations. While the performances of NGOFS and NGOFS2 are comparable for water temperature, water salinity, and water current speed, the NGOFS2 performance for water levels is slightly improved. The slight improvement for NGOFS2 water level simulation might be associated with adding Corpus Christi Bay and its intracoastal waterways, Lake Pontchartrain, and Barataria Bay to allow tide propagation into these water bodies instead of piling water at the coast as found in NGOFS.
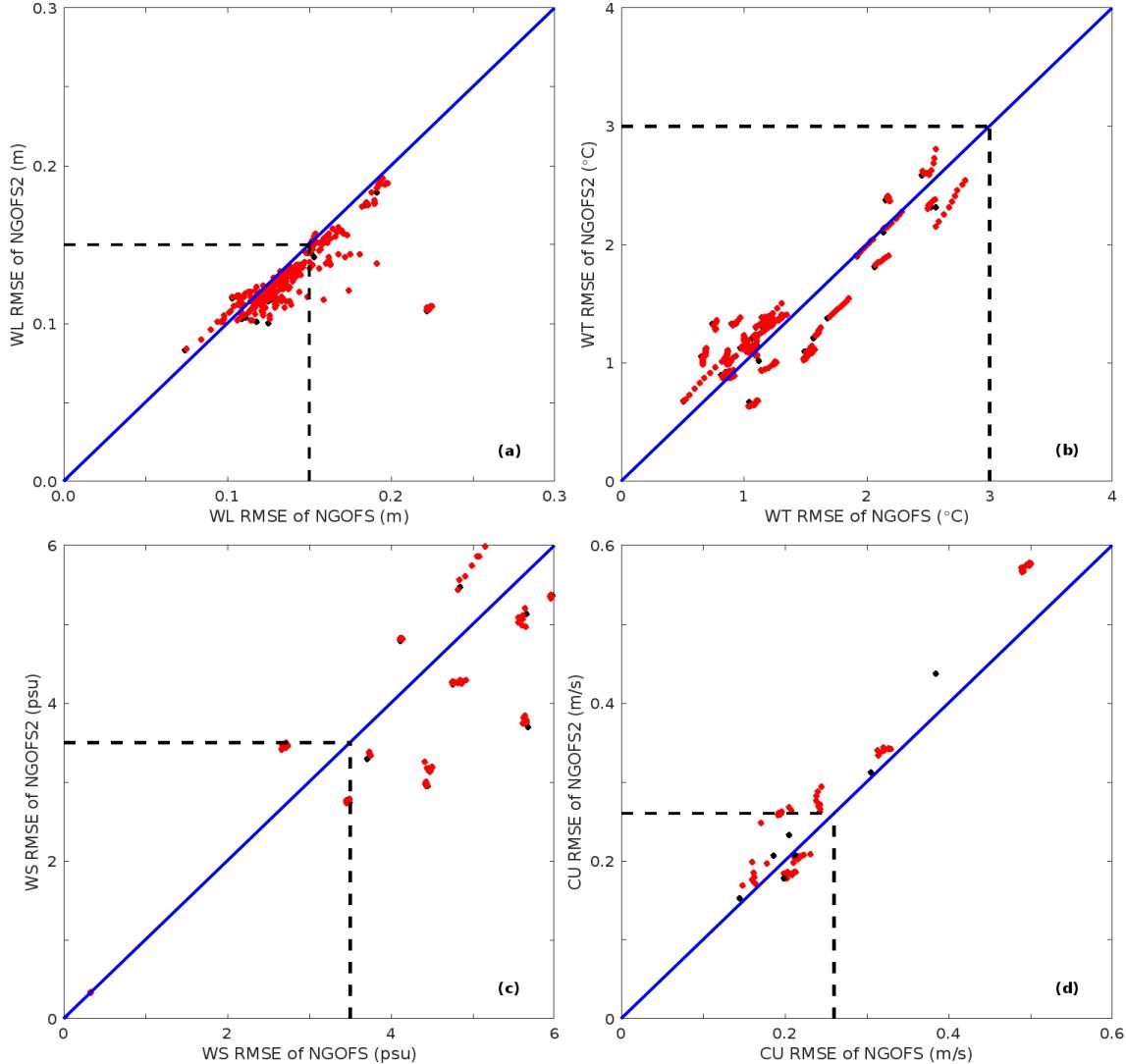
Figure 13. Comparisons of root mean square errors (RMSEs) of the Northern Gulf of Mexico Operational Forecast System (NGOFS) and the upgraded Northern Gulf of Mexico Operational Forecast System (NGOFS2) for (a) water levels (WL), (b) water temperature (WT), (c) water salinity (WS), and (d) water current speeds (CU). The dashed lines are RMSE values of 0.15 m for water levels, 3°C for water temperature, 3.5 psu for water salinity, and 0.26 m/s for water current speeds. The black (red) dots are the skill assessment results from nowcast (forecast) simulation.

4.4 Nowcast and Forecast Skill Assessment Statistics

4.4.1 Observed data sources

Table 4 and Figure 14 provide the information for NWLON stations where the water level observation data were collected. Table 5 and Figure 15 provide the information for stations where the water temperature observation data were collected. Table 6 and Figure 16 provide the information for stations where the water salinity observation data were collected. Table 7 and Figure 17 provide the information for stations where the water current speed observation data were collected. These observation data were downloaded from one of the following web sites:

1. NOAA CO-OPS verified historical data at NWLON stations (https://tidesandcurrents.noaa.gov/axis/webservices/)

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2. NOAA National Data Buoy Center (NDBC) historical data (https://www.ndbc.noaa.gov/data/historical/)
3. USGS water data (https://nwis.waterdata.usgs.gov/usa/nwis/)

These data are used for skill assessments.

Table 4. The observation stations used for water level skill assessment.

Sta. #	Station ID	Lat (º)	Lon (º)	Station Name	Sta. #	Station ID	Lat (º)	Lon (º)	Station Name
1	8775237	20.84	-97.07	Port Aransas, TX	27	8770808	29.60	-94.39	High Island, TX
2	8773701	28.45	-96.39	Port O'Connor, TX	28	8770520	29.98	-93.87	Rainbow Bridge, TX
3	8771013	29.48	-94.92	Eagle Point, TX	29	8770475	29.87	-93.93	Port Arthur, TX
4	8762075	29.11	-90.20	Port Fourchon, LA	30	8770570	29.73	-93.87	Sabine Pass N., TX
5	8735180	30.25	-88.08	Dauphin Island, AL	31	8770822	29.68	-93.84	Texas Point, TX
6	8729840	30.40	-87.21	Pensacola, FL	32	8767816	30.22	-93.22	Lake Charles, TX
7	8779748	26.08	-97.18	S. Padre Island, TX	33	8767961	30.19	-93.30	Bulk Terminal, TX
8	8779770	26.06	-97.22	Port Isabel, TX	34	8768094	29.77	-93.34	Calcasieu Pass, TX
9	8779749	26.07	-97.16	Brazos Santiago, TX	35	8766072	29.56	-92.31	Freshwater Canal, LA
10	8775870	27.58	-97.22	Corpus Christi, TX	36	8764227	29.45	-91.34	Atchafalaya Delta, LA
11	8775792	27.63	-97.24	Packery Channel, TX	37	8764314	29.37	-91.38	Eugene Island, LA
12	8775296	27.81	-97.39	Lexington, CCB, TX	38	8761724	29.26	-89.96	Grand Isle, LA
13	8775241	27.84	-97.04	Aransas Pass, TX	39	8760922	28.93	-89.41	Pilots Station, LA
14	8774770	28.02	-97.05	Rockport, TX	40	8761305	29.87	-89.67	Shell Beach, LA
15	8774230	28.23	-96.80	Aransas W. Ref, TX	41	8762483	30.07	-90.39	I-10 Bonner Carre, LA
16	8773037	28.41	-96.71	Seadrift, TX	42	8761927	30.03	-90.11	New Canal Stat., LA
17	8773259	28.64	-96.61	Port Lavaca, TX	43	8747437	30.33	-89.33	Bay Waveland, MS
18	8773146	28.71	-95.91	Matagorda City, TX	44	8741533	30.37	-88.56	Pascagoula, MS
19	8772985	28.77	-95.62	Sargent, TX	45	8737048	30.71	-88.04	Mobile St. Docks, AL
20	8772471	28.94	-95.30	Freeport SPIP, TX	46	8736897	30.65	-88.06	USCG Sec Mobile, AL
21	8770777	29.73	-95.27	Manchester, TX	47	8735391	30.57	-88.09	Dog River Bridge, AL
22	8770613	29.68	-94.99	Morgans Point, TX	48	8735523	30.44	-88.11	E Fowl R. Bridge, AL
23	8771486	29.30	-94.90	Galvest. R. Brd, TX	49	8738043	30.38	-88.16	W Fowl R. Bridge, AL
24	8771450	29.31	-94.79	Galvest. Pier 21, TX	50	8739803	30.41	-88.25	Bayou La Batre, AL
25	8771341	29.36	-94.72	GB Entrance, TX	51	8732828	30.42	-87.83	Weeks Bay, AL
26	8770971	29.52	-94.51	Rollover Pass, TX	52	8729108	30.15	-85.67	Panama City, FL
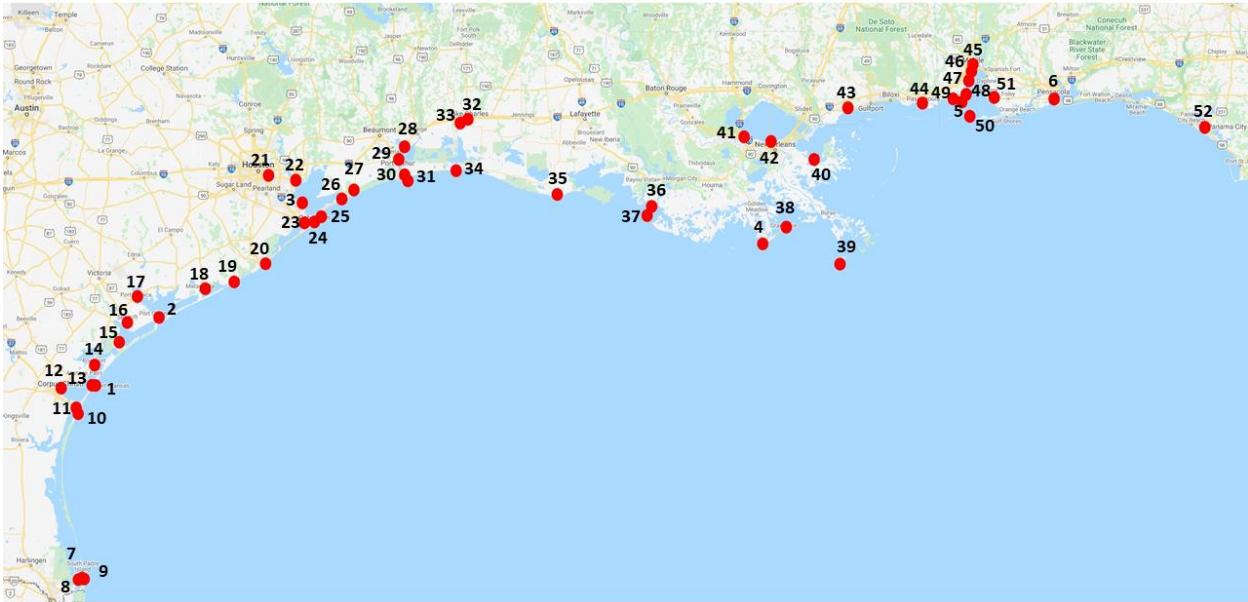
Figure 14. The locations of water level observation stations used for model skill assessment. The names, longitudes, and latitudes of stations are provided in Table 4.

Table 5. The observation stations used for water temperature skill assessment.

Sta. #	Station ID	Lat (º)	Lon (º)	Station Name	Sta. #	Station ID	Lat (º)	Lon (º)	Station Name
1	8729840	30.40	-87.21	Pensacola, FL	29	8771341	29.36	-94.72	GB Entrance, TX
2	8736897	30.65	-88.06	USCG Sec Mobile, AL	30	8772471	28.94	-95.30	Freeport SPIP, TX
3	8764227	29.45	-91.35	Amerada Pass, LA	31	8772985	28.77	-95.62	Sargent, TX
4	8770613	29.68	-94.99	Morgans Point, TX	32	8773259	28.64	-96.61	Port Lavaca, TX
5	8775870	27.58	-97.22	Corpus Christi, TX	33	8773701	28.45	-96.39	Port O'Connor, TX
6	8768094	29.77	-93.34	Calcasieu Pass, TX	34	8773767	28.43	-96.33	MB Ent. Channel, TX
7	8737048	30.71	-88.04	Mobile St. Docks, AL	35	8773037	28.41	-96.71	Seadrift, TX
8	8732828	30.42	-87.83	Weeks Bay, AL	36	8774770	28.02	-97.05	Rockport, TX
9	8735180	30.25	-88.08	Dauphin Island, AL	37	8775244	27.83	-97.48	Nueces Bay, TX
10	8741533	30.37	-88.56	Pascagoula, MS	38	8775296	27.81	-97.39	Lexington, CCB, TX
11	8747437	30.33	-89.33	Bay Waveland, MS	39	8775241	27.84	-97.04	Aransas Pass, TX
12	8761927	30.03	-90.11	New Canal Stat., LA	40	8775792	27.63	-97.24	Packery Channel, TX
13	8761305	29.87	-89.67	Shell Beach, LA	41	8776604	27.30	-97.40	Baffin Bay, TX
14	8760721	29.18	-89.26	Pilottown, LA	42	8777812	26.83	-97.49	Rincon del San Jose, TX
15	8761955	29.93	-90.14	Carrollton, LA	43	8778490	26.56	-97.42	Port Mansfield, TX
16	8761724	29.26	-89.96	Grand Isle, LA	44	8779280	26.26	-97.30	Realitos Peninsula, TX
17	8764314	29.37	-91.38	Eugene Island, LA	45	8779770	26.06	-97.22	Port Isabel, TX
18	8764044	29.67	-91.24	Berwick, LA	46	8779749	26.07	-97.16	Brazos Santiago, TX
19	8766072	29.56	-92.31	Freshwater Canal, LA	47	42020	26.94	-96.71	50 nm of CCB, TX
20	8767816	30.22	-93.22	Lake Charles, TX	48	42035	29.23	-94.41	22 nm of Galveston, TX
21	8767961	30.19	-93.30	Bulk Terminal, TX	49	42019	27.91	-95.33	60 nm of Freeport, MS
22	8770475	29.87	-93.93	Port Arthur, TX	50	BSCA1	30.33	-87.83	Bon Secour, AL
23	8770570	29.73	-93.87	Sabine Pass N., TX	51	CRTA1	30.31	-88.14	Cedar Point, AL
24	8770808	29.60	-94.39	High Island, TX	52	DPHA1	30.25	-88.08	Dauphin Island, AL
25	8770777	29.73	-95.27	Manchester, TX	53	PTAT2	27.83	-97.05	Port Aransas, TX
26	8770971	29.52	-94.51	Rollover Pass, TX	54	08017095	30.03	-93.30	Calcasieu Lake, LA
27	8771013	29.48	-94.92	Eagle Point, TX	55	08017044	30.24	-93.25	USGS Calc River, LA
28	8771486	29.30	-94.90	Galvest. R. Brd, TX	56	08017118	29.82	-93.35	Cameron, LA
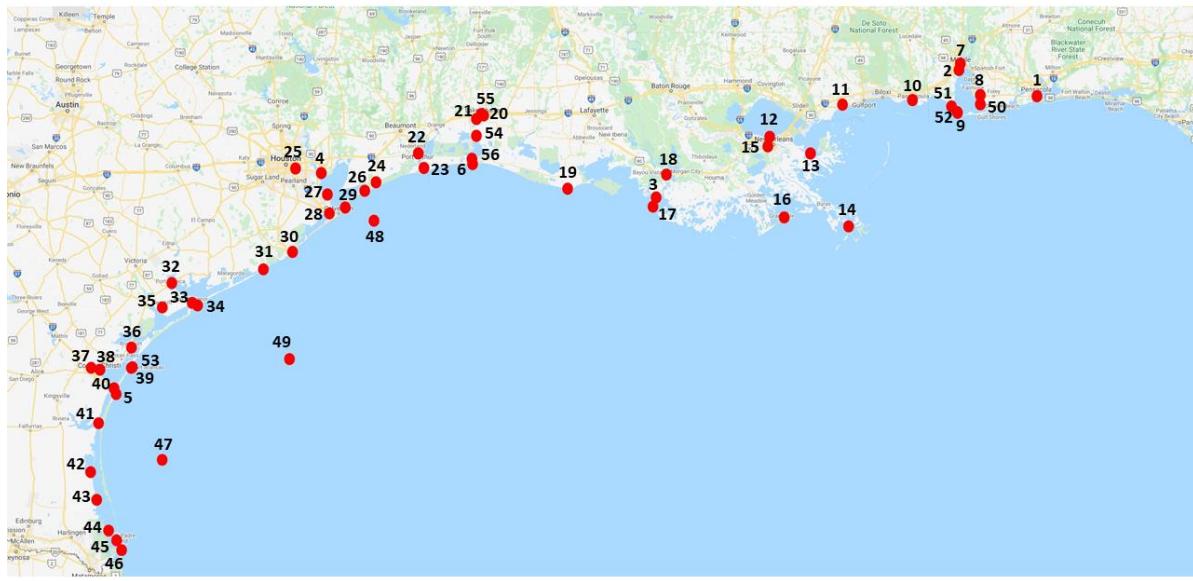
Figure 15. The locations of water temperature observation stations used for model skill assessment. The names, longitudes, and latitudes of stations are provided in Table 5.

Table 6. The observation stations used for water salinity skill assessment.

Sta. #	Station ID	Lat (º)	Lon (º)	Station Name	Sta. #	Station ID	Lat (º)	Lon (º)	Station Name
1	8770613	29.68	-94.99	Morgans Point, TX	8	08017118	29.82	-93.35	Cameron, LA
2	8771013	29.48	-94.92	Eagle Point, TX	9	RISL1	30.31	-88.58	Round Island Light, MS
3	BSCA1	30.33	-87.83	Bon Secour, AL	10	ESIL1	30.26	-88.87	E Ship Island Light, MS
4	CRTA1	30.31	-88.14	Cedar Point, AL	11	BBPC1	30.39	-88.86	Biloxi Bay, MS
5	DPHA1	30.25	-88.08	Dauphin Island, AL	12	GULF1	30.32	-88.97	Gulfport Light, MS
6	08017095	30.03	-93.30	Calcasieu Lake, LA	13	MESL1	30.24	-89.24	Merrill Light, MS
7	08017044	30.24	-93.25	USGS Calc River, LA	14	JISL1	30.19	-89.42	Joseph Island Light, MS
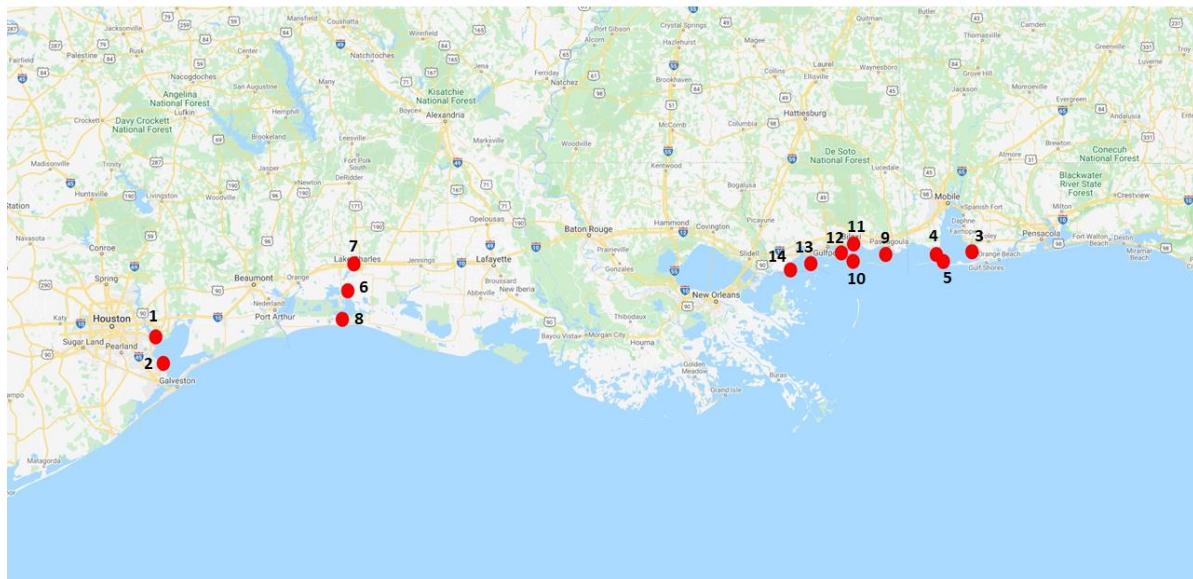
Figure 16. The locations of water salinity observation stations used for model skill assessment. The names, longitudes, and latitudes of stations are provided in Table 6.

Table 7. The observation stations used for water current speed skill assessment.

Sta. #	Station ID	Lat (º)	Lon (º)	Station Name	Sta. #	Station ID	Lat (º)	Lon (º)	Station Name
1	42042	28.98	-94.92	TABS Buoy B, TX	6	sn0701	29.87	-93.93	Port Arthur, TX
2	42045	26.22	-96.50	TABS Buoy K, TX	7	g06010	29.34	-94.74	GB Entr. Channel, TX
3	lc0201	29.76	-93.34	Cameron Pier, LA	8	mg0201	28.43	-96.33	MB Entr. Channel, TX
4	sn0201	29.73	-93.87	USCG Sabine, LA	9	cc0301	27.84	-97.05	Port Aransas, TX
5	sn0301	29.75	-93.89	Sabine Front Range, LA	10	cc0401	27.82	-97.21	Oxy Oil & Gas CM, TX
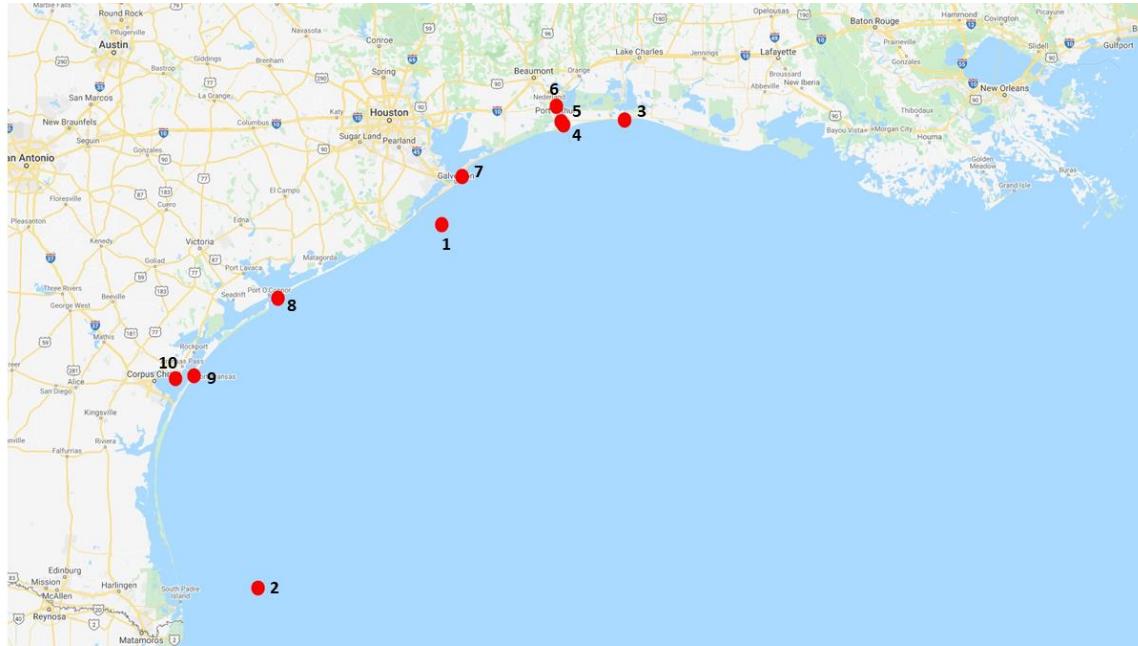
Figure 17. The locations of current speed observation stations used for model skill assessment. The names, longitudes, and latitudes of stations are provided in Table 7.

The NGOFS2 semi-operational nowcast and forecast skill assessment period presented in this report is from March 15, 2020 through March 15, 2021. The outputs from these simulations and downloaded observation data were analyzed using the NOS standard skill assessment software system. Generally, RMSEs and central frequencies (CFs) at most of the stations satisfy the NOS accepted error criteria for most variables in both nowcast and forecast simulations. The results of the skill assessment for water levels, water temperatures, salinities, and current speeds are discussed in detail in the following subsections.

4.4.2 Results of water level skill assessment

The skill assessments were performed at 52 water level observation stations (Table 4; Figure 14). Modeled water levels generally agree with observations. An example of an N/F result at station Grand Isle, LA, on September 30, 2021, is shown in Figure 9.

For all of the 52 water level stations, except for Calcasieu Pass, TX (NWLON ID: 8768094), the RMSEs of nowcast simulated water level are less than 0.15 m. The nowcast RMSE results are shown in Figures 18 and 19: the blue (red) pins are the nowcast RMSE at that location with a value of less (more) than 0.15 m in Figure 18, and color-coded RMSEs are provided in Figure 19. It should be noted that although RMSE at Calcasieu Pass, TX (red arrow, Figure 18), is more than 0.15 m, it is just 0.152 m (only 0.2 cm larger).
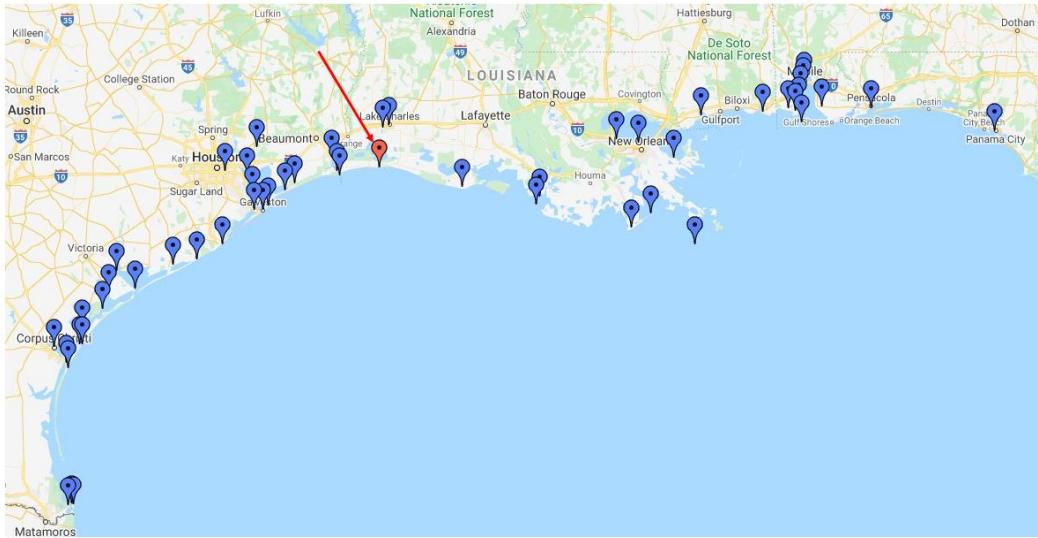
Figure 18. Nowcast root mean square error (RMSE) of water level. The blue (red) pins are for RMSE less (greater) than 0.15 m.

Figure 19 also shows the forecast simulated water level RMSE values at different forecast lead times from 6 hours to 48 hours. In general, most of the forecasts up to 48 hours have RMSEs less than 0.15 m. Figure 20 shows the 52 stations' mean water level RMSEs of the nowcasts (N) and forecasts (F00, F06, F12, F18, F24, F30, F36, F42, and F48). The station mean RMSEs are around 0.12 m and slightly increase from nowcast to forecast, increasing with forecast time because nowcast simulation used the analyzed meteorological forcing, which in general is more accurate than the forecast meteorological forcing.
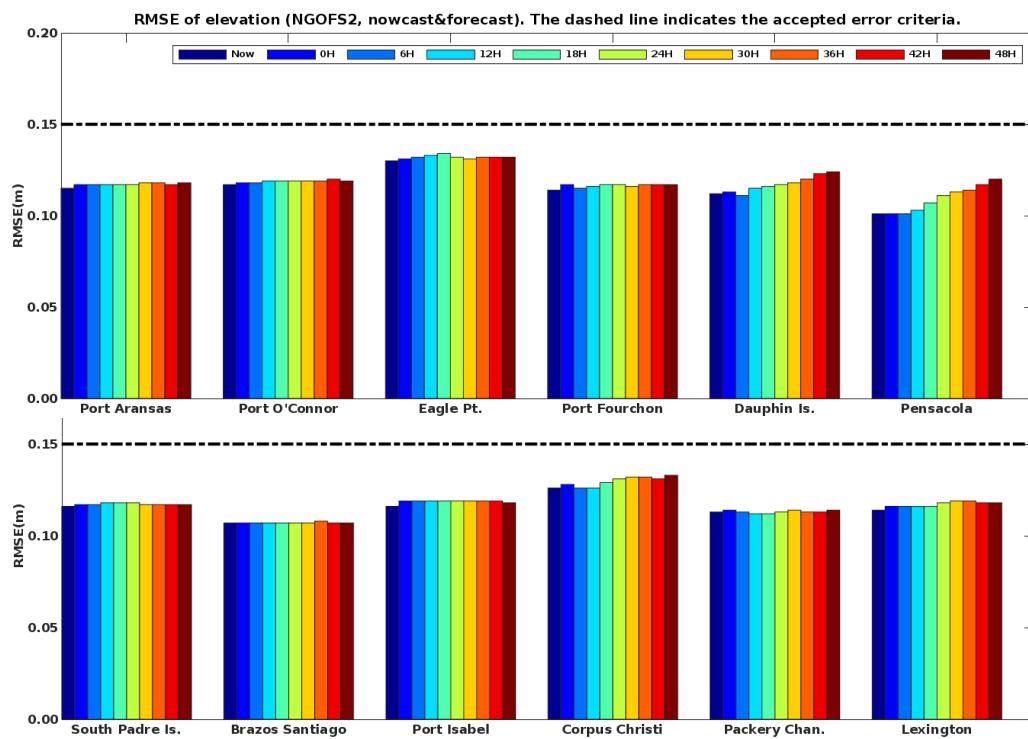
Figure 19. Forecast root mean square error (RMSE) of water levels.

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RMSE of elevation (NGOFS2, nowcast&forecast). The dashed line indicates the accepted error criteria.
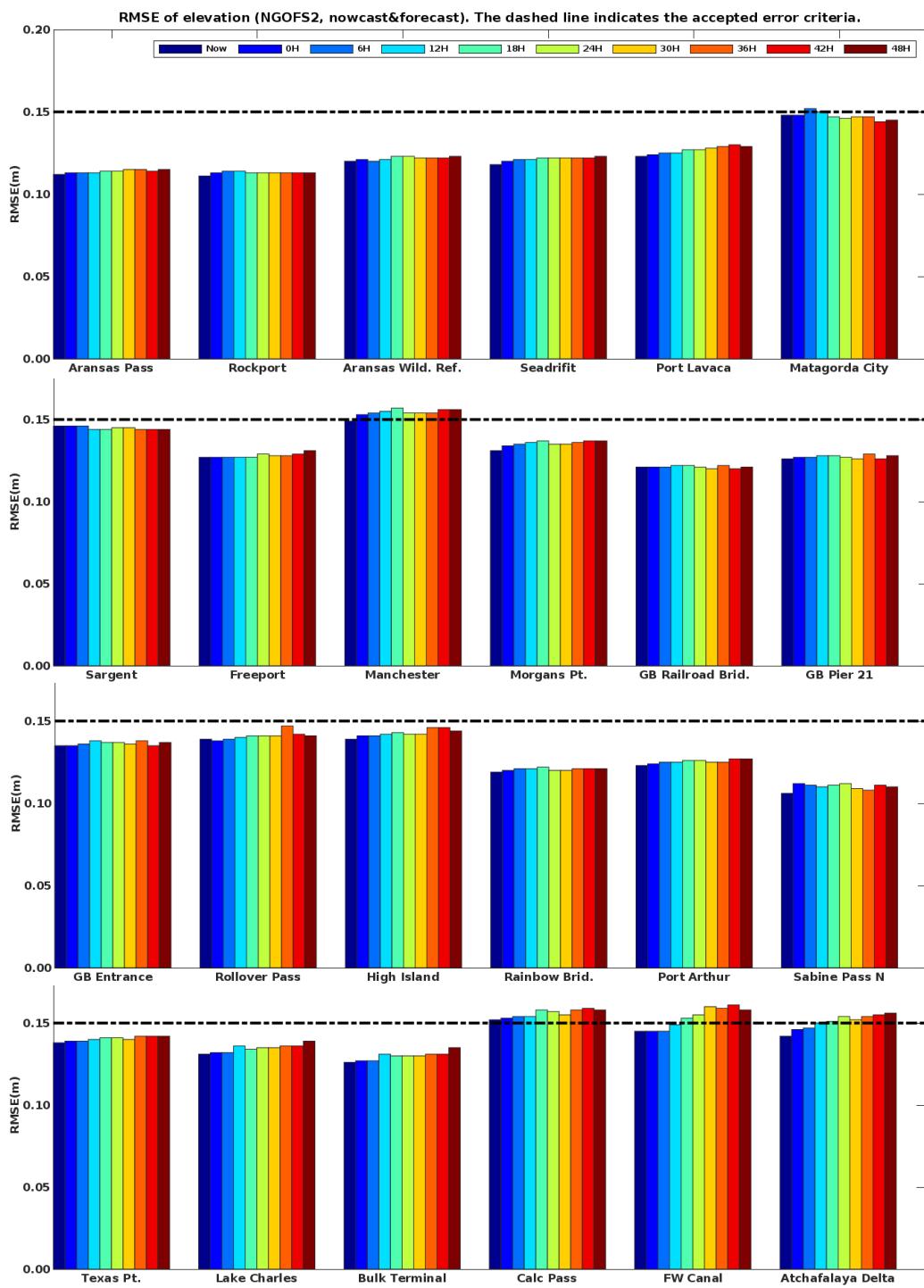
Figure 19 (continued).
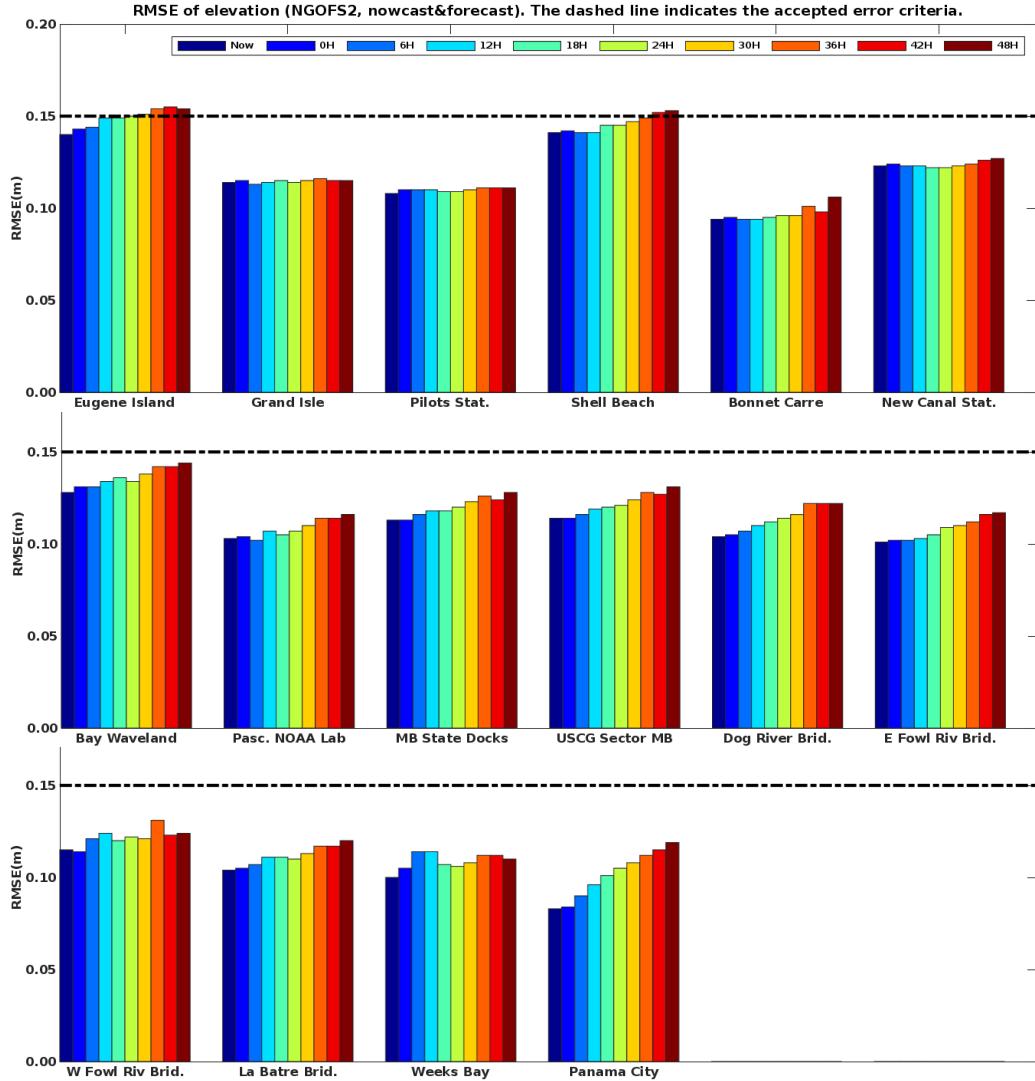
Figure 19 (continued).
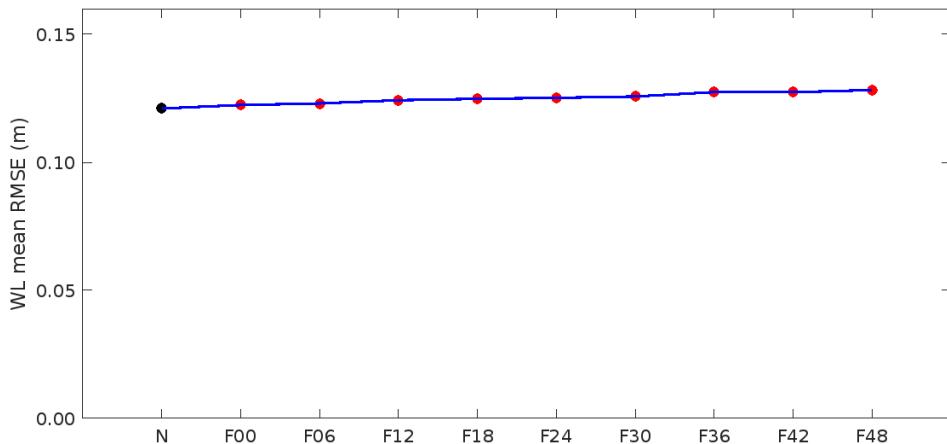
Figure 20. The 52-station mean root mean square errors (RMSEs) of the nowcast (N) and forecast (F00, F06, F12, F18, F24, F30, F36, F42, and F48) water level skill assessments.

Appendix A provides additional details of water level skill assessment metrics at the 52 stations (Tables A1-A52). Generally, nowcast and forecast CF values at all locations range from

70% to 95.0% (where ≥90% is the accepted error criteria). When compared with other OFSs, the relatively low CF is associated with 2 main factors: 1) the tidal signal in the NGOM is relatively weak, and 2) the non-tidal sea level variations in this region are significantly impacted by extreme meteorological events, such as hurricanes and tropical storms.

Time series comparisons of the nowcast simulated and observed water levels at 52 stations are shown in Appendix B. Nowcast simulated results generally agree with the observations at most of the stations, even during the storm surge induced by hurricanes, such as at the Pensacola, FL, station in the middle of September 2020 when hurricane Sally made landfall as a Category 2 and generated more than 4 feet of storm surge (Figure B-1).

4.4.3 Results of near-surface water temperature skill assessment

The skill assessments were performed at 56 water temperature observation stations (Table 5; Figure 15). Modeled near-surface water temperatures generally agree with observations. An example of an N/F result at station High Island, TX, on January 5, 2022, is shown in Figure 10.

For all of the 56 water temperature stations, the maximum RMSE of nowcast simulated near-surface water temperature is 2.6ºC. The nowcast RMSE results are shown in Figures 21 and 22: the blue (red) pins are the nowcast RMSE at that location with a value of less (more) than 3ºC in Figure 21, and color-coded RMSEs are provided in Figure 22. The RMSEs at some stations, such as Pilottown and 60 nautical miles (NM) of Freeport, are as small as 0.5ºC. These water temperature skill assessment matrices demonstrate that the NGOFS2 performs very well in the nowcast water temperature simulation.
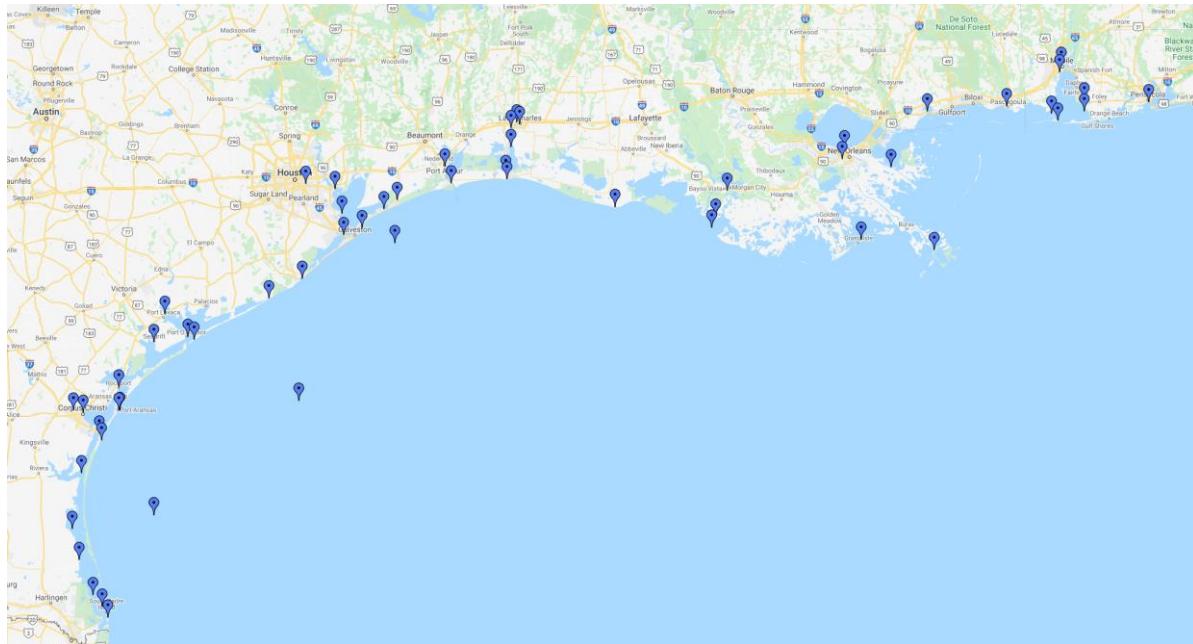
Figure 21. Nowcast root mean square error (RMSE) of near-surface water temperature. The blue (red) pins are for RMSE less (greater) than 3ºC.

Figure 22 also shows the forecast simulated near-surface water temperature RMSE values at different forecast lead times from 6 hours to 48 hours. In general, the RMSEs for up to 48-hour forecasts are below 3ºC. Figure 23 shows the 56 stations' mean water temperature RMSEs of nowcasts (N) and forecasts (F00, F06, F12, F18, F24, F30, F36, F42, and F48). The mean RMSEs are about 1.5ºC for the nowcasts and forecasts. Figures 22 and 23 demonstrate that the NGOFS2 performs very well in simulating the water temperatures.

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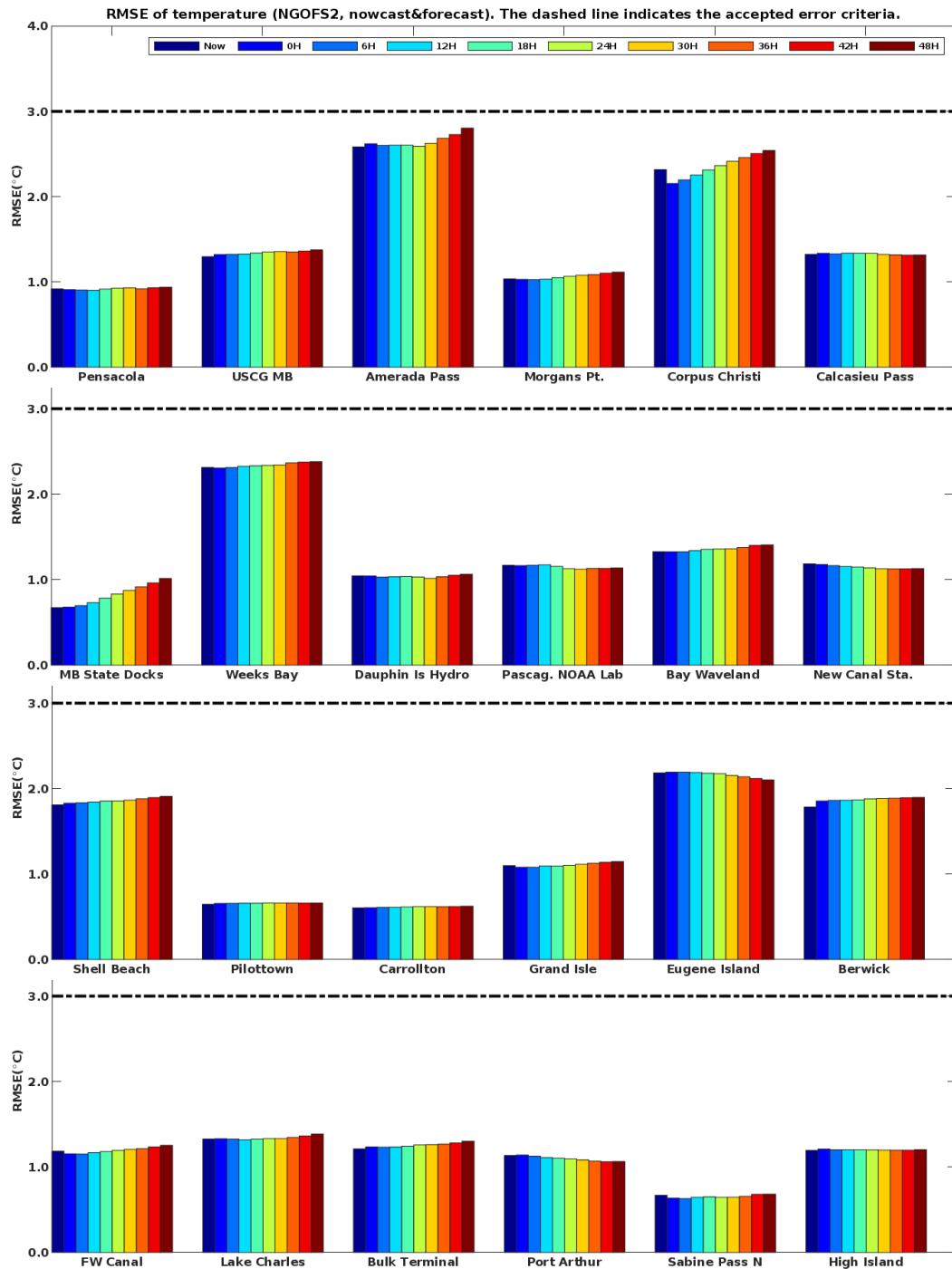
Figure 22. Forecast root mean square errors (RMSEs) of near-surface water temperatures.

Figure 22 (continued).

RMSE of temperature (NGOFS2, nowcast&forecast). The dashed line indicates the accepted error criteria.
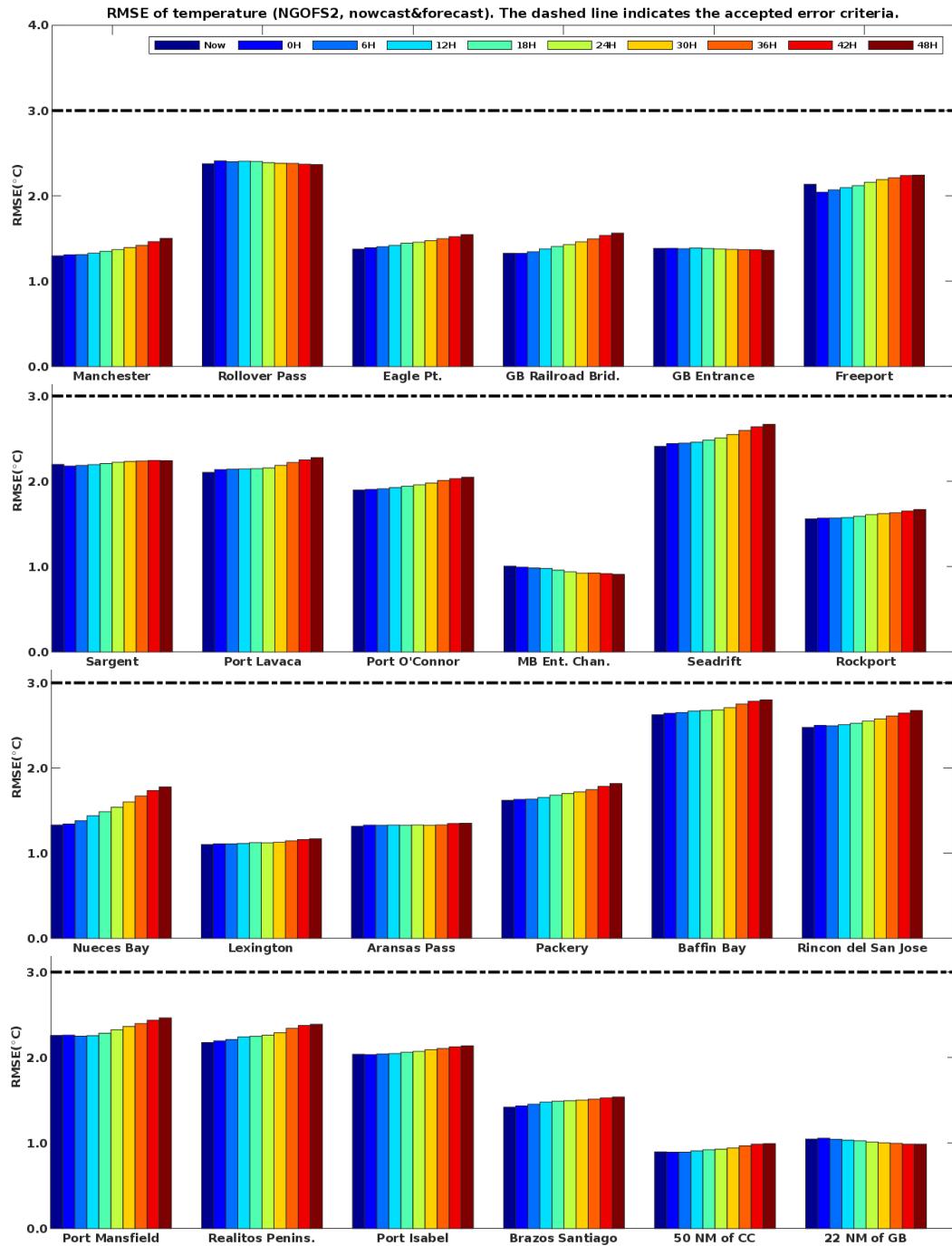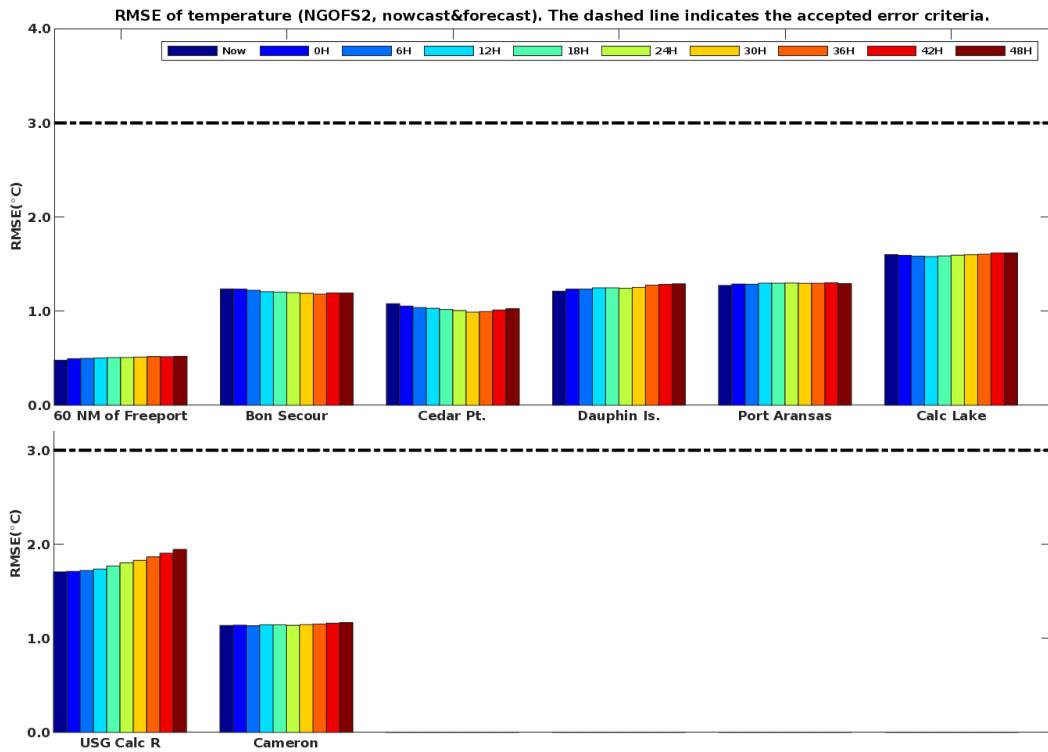
Figure 22 (continued).
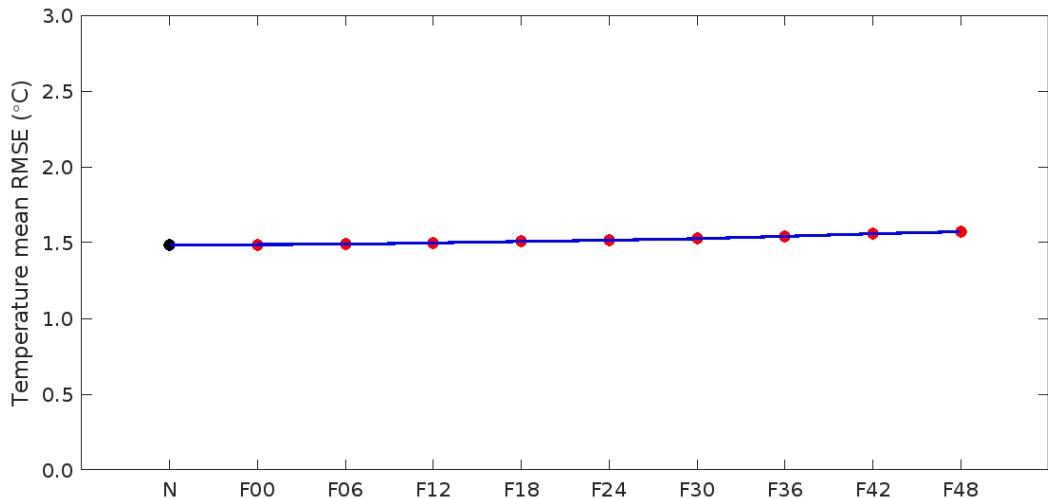
Figure 23. The 56-station mean root mean square errors (RMSEs) of nowcast (N) and forecast (F00, F06, F12, F18, F24, F30, F36, F42, and F48) near-surface water temperature skill assessment.

Appendix C provides additional details of water temperature skill assessment metrics at the 56 stations (Tables C1-C56). Generally, nowcast and forecast CF values range from 80% to 95% (where ≥90% is the NOS accepted error criteria). In general, at stations located in the coastal region, such as stations number 47 through 49, their RMSEs are less than 1ºC and their CFs are more than 99%, respectively.

Time series comparisons of the nowcast simulated and observed near-surface water temperatures at all stations are shown in Appendix D. Nowcast simulated results generally agree with the observations at most of the stations. The model captures the water temperature diurnal, synoptic (cold frontal), and seasonal variations. It is recognized that at certain stations, such as

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Amerada Pass (#3), Eugene Island (#17), and Berwick (#18), there is an approximately 20ºC drop in model simulated water temperature on June 10, 2020. Further investigation revealed that the observed temperature in the Atchafalaya River has an implausible 1ºC value beginning on June 10, 2020, and ending on June 15, 2020, in the WCOSS data tank, which is much lower than the normal water temperature of about 27ºC during this period at this location. Because of the larger freshwater discharge in Atchafalaya River, low temperature fluxes were introduced into the coastal region adjacent to the Atchafalaya River mouth. Tidal mixing and diffusion generated a large temperature drop at these stations. This suggests that the importance of high-standard QA/QC of observed data is critical for the assessment and monitoring of an operational system.

4.4.4 Results of near-surface water salinity skill assessment

The skill assessments were performed at 14 salinity observation stations (Table 6; Figure 16). Modeled near-surface salinity at some stations sometimes agrees with observations; however, at other times, there are significant discrepancies between NGOFS2 simulated and observed salinities. An example of an N/F result at USGS station Joseph Island Light, Mississippi Sound, on June 9, 2020, is shown in Figure 11.

Unlike water temperature, the water salinity changes from 0 psu in the river course beyond the tidal excursion to more than 30 psu in the coastal region, and to more than 35 psu farther offshore. Compared with other ocean state variables, such as water level and water temperature, salinity is one of the most difficult variables to simulate in a hydrodynamic model because of two factors: 1) model configuration—the extent of the tidal excursion depends on the tidal amplitudes, freshwater discharge rate, width of the river, and river bottom materials, resulting in the model grids usually terminating at a location where the model input salinity is not always zero in a river system (however, model input freshwater salinity is specified as zero, causing model-underestimated salinity in most of the estuaries and bays); and 2) the accuracy of salinity measurements (an example is shown in Figure 24, which has high frequency spikes).
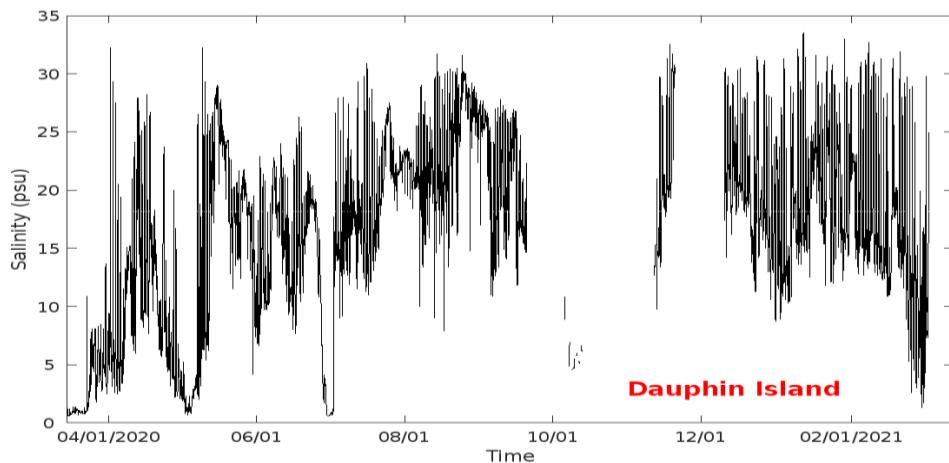
Figure 24. Observed near-surface water salinity at Dauphin Island, AL, National Water Level Observation Network (NWLON) station from March 15, 2020, through March 15, 2021.

For 6 of the 14 water salinity stations, the RMSEs of the nowcast simulated near-surface water salinity are less than 3.5 psu, and the RMSEs of the remaining 8 stations are greater than 4.0 psu and less than 7.0 psu. The nowcast RMSE results are shown in Figure 25.

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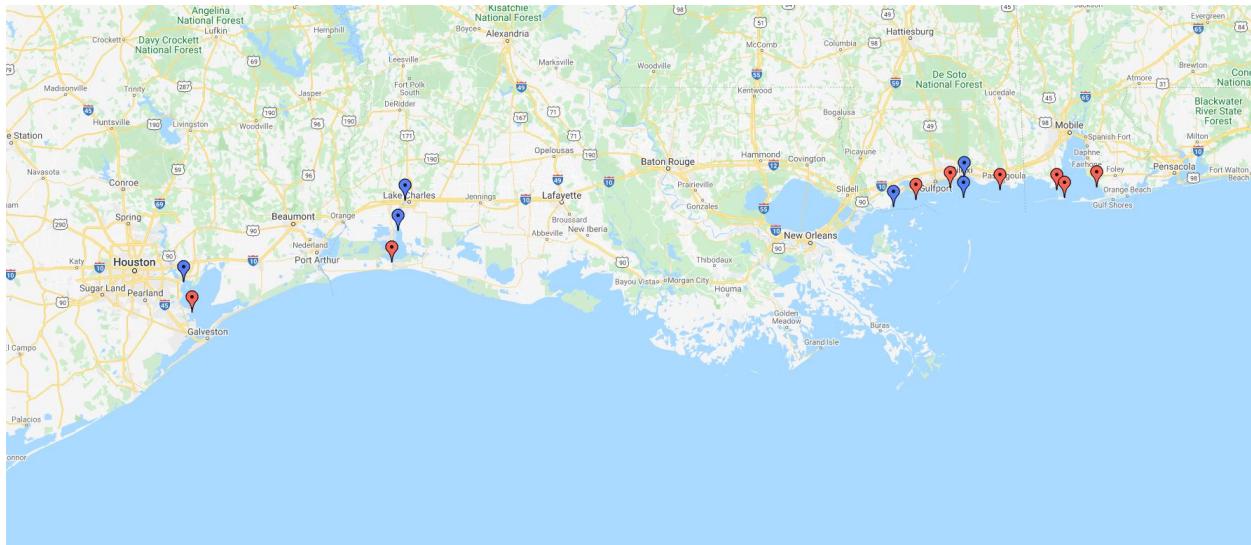
Figure 25. Nowcast root mean square error (RMSE) of near-surface water salinity. The blue (red) pins are for RMSE less (greater) than 3.5 psu.

Figure 26 shows the forecast simulated near-surface water salinity RMSE values at different forecast lead times from 6 hours to 48 hours. Six stations' forecasts up to 48-hour RMSEs are less than 3.5 psu, and the other 8 stations are more than 3.5 psu. Because there are only 14 observed stations available, the stations' mean RMSE will not be discussed for water salinity skill assessment. As mentioned above, it is necessary to take the 2 factors into account to improve model salinity performance and validation.

Appendix E provides additional details of salinity skill assessment metrics at the 14 stations (Tables E1-E14). Generally, nowcast and forecast CF values at all locations are less than 90%, the NOS accepted error criteria for water salinity CF. The low CFs in the water salinity skill assessment are due to the low quality of the observation data (high frequency spikes), fewer observation data available to compare with model simulation, and model grids do not extend far enough upstream of the river course to extend beyond the tidal excursion.

Time series comparisons of the nowcast simulated and observed near-surface water salinity at all stations are shown in Appendix F. Nowcast simulated results generally show similar seasonal (wet and dry season) variation as observations in most of the stations. The same large RMSE and low CF are found in NGOFS2 hindcast simulations (Yang et al. 2022), as well.
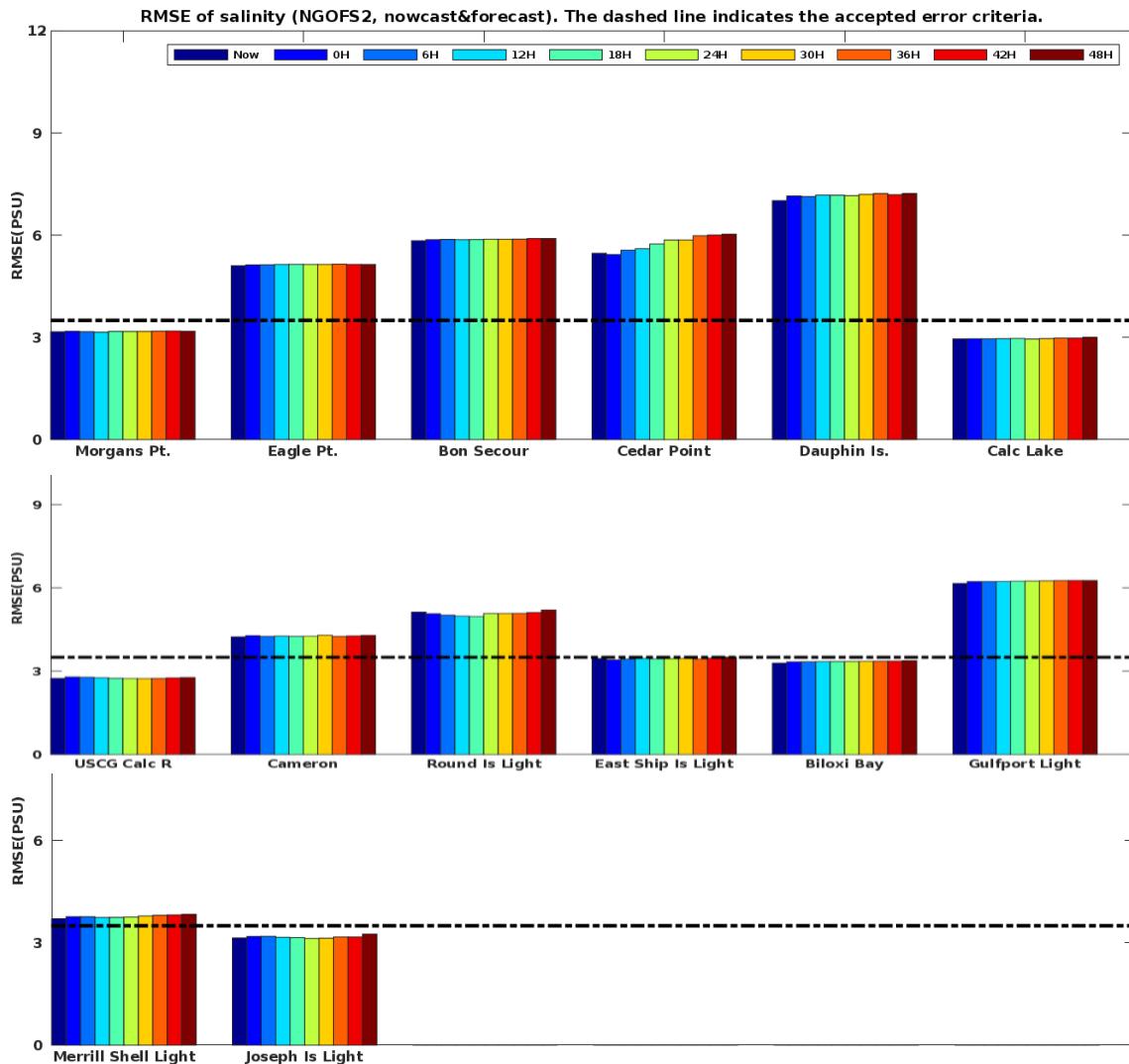
Figure 26. Forecast root mean square errors (RMSEs) of near-surface water salinity.

4.4.5 Results of near-surface water current skill assessments

The skill assessments were performed at 10 current observation stations (Table 7; Figure 17). Modeled near-surface water current speed and direction at some stations agree with observations. An example of an N/F result of current speed and current direction at station Port Aransas Channel View, TX, on September 30, 2021, is shown in Figure 12.

For 7 of the 10 current stations, located west of Louisiana and along the Texas coast, the RMSEs of nowcast simulated near-surface water current speed are 0.26 m/s. The nowcast RMSE results of water current speed are shown in Figures 27 and 28: the blue (red) pins are the nowcast RMSE at that location with a value of less (more) than 0.26 m/s in Figure 27, and color-coded RMSEs are provided in Figure 28.
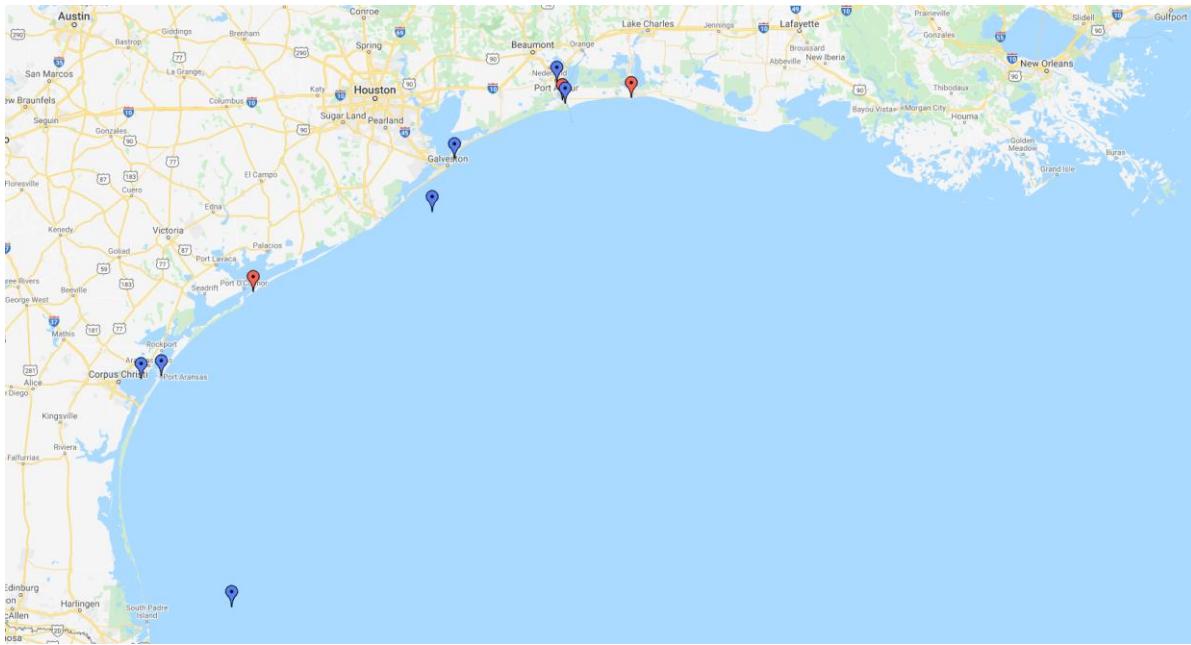
Figure 27. Nowcast root mean square error (RMSE) of near-surface water current speeds. The blue (red) pins are for RMSE less (greater) than 0.26 m/s.

Figure 28 shows the RMSE values of the forecast simulated near-surface current speed at different forecast lead times from 6 hours to 48 hours. Six stations' forecast RMSEs up to 48 hours are less than 0.26 m/s, and the other 4 stations are greater than 0.26 m/s. It should be noted that at station TABS Buoy K, the nowcast RMSE is less than 0.26 m/s. However, their forecast RMSEs (from 6 to 48 hours) are larger than 0.26 m/s. Because there are only 10 observed stations for current speed skill assessment available, the stations' mean RMSE will not be discussed.

Appendix G provides additional details of current speed skill assessment metrics at the 10 stations (Tables G1-G10). The nowcast and forecast CF values at all locations range from more than 99%, as seen at station #10 Oxy Oil and Gas CM, to less than 20%, as seen at station #5 Sabine Front Range, where the 90% is the NOS accepted error criteria for water current speed. The low CF in current speed skill assessment at Sabine Front Range is attributed to low model grid resolution and complex bathymetry around this station. The observation station is located near the deep navigational channel that connects the GOM coast with Sabine Lake where the water depth is more than 10 m and the water current is strongest; however, the model grid depth at the corresponding model grid, which is offset a short distance from the strong currents, is less than 8 m.

Time series comparisons of nowcast simulated and observed near-surface water current speeds at all stations are shown in Appendix H. Although model simulated current speeds are underestimated to some extent, the nowcast successfully simulated spring-neap tidal cycles at all stations. As mentioned above, the model underestimations are associated with the model grid resolution, model grid depth accuracy, and meteorological wind forcing. To improve water current simulations, the model grid resolution must be increased enough to resolve the deep navigational channel (which may impact computational efficiency) and improve bathymetric data quality in areas near the observation stations.
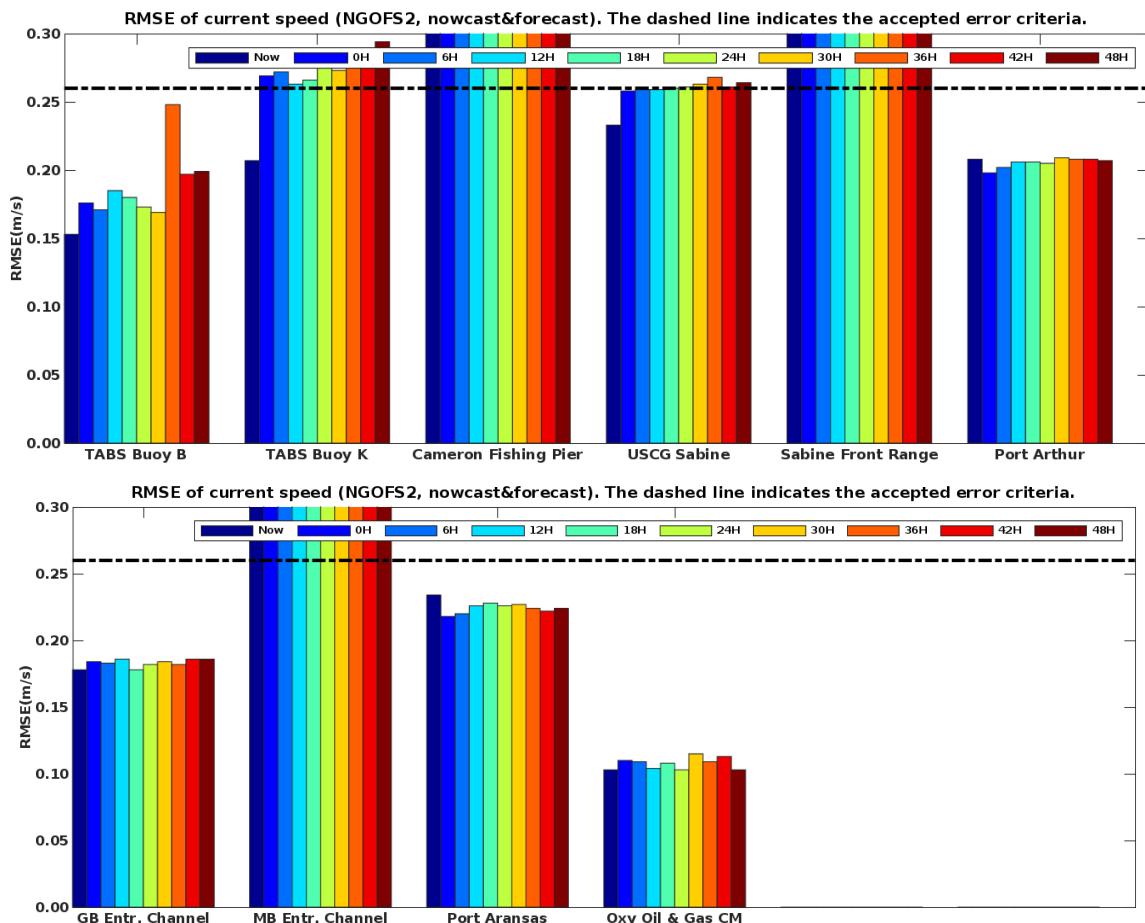
Figure 28. Forecast root mean square errors (RMSEs) of near-surface water current speed.

5. ASSESSING COASTAL CHANGE IMPACTS AND ELEVATED WATER LEVELS DURING STORM EVENTS

Based on information provided in Sections 3 and 4, NGOFS2 provides accurate guidance, particularly for water level and water temperature N/F simulations. The NGOFS2 products not only support vessels transiting in and out of the ports, they can also be used to assess the impacts of coastal changes, such as coastal reclamation projects or the closing or opening of a channel. They can also provide forecast guidance of elevated water levels when a hurricane approaches the Gulf Coast or makes landfall within the model domain. The following 2 sections contain examples of NGOFS2 applications.

5.1 Impacts of Rollover Pass closure on water T&S in Rollover Bay

Rollover Bay is located on the east side of Galveston Bay (Figure 29). Rollover Bay connects to the GOM coast via Rollover Pass (marked as pink dots inside the red ellipse in Figure 29), which allows the high salinity coastal water to move into Rollover Bay during a flood tide and low salinity water from the bay to move out of Rollover Bay and into the GOM coastal region during an ebb tide. This tidally-induced salinity variability creates a suitable environment for the local biological community (Shirley et al. 2004).

Figure 29. Enlarged view of the upgraded Northern Gulf of Mexico Observational Forecast System (NGOFS2) model grid in Rollover Bay. The pink dots inside the red circle designate the location of Rollover Pass that connects Rollover Bay with the Gulf of Mexico (GOM) coastal region. The red star is the Rollover Pass National Water Level Observation Network (NWLON) station location.

Rollover Pass was opened in 1955 and closed in January 2020. During the initial development of the NGOFS2, Rollover Pass was included in the model grid to allow water exchanges between Rollover Bay and the GOM coast. After Rollover Pass was closed in January, 2020, the model grid depths for Rollover Pass were modified to block the water exchange between Rollover Bay and GOM coastal water. To investigate the impacts of the Rollover Pass closure on water salinity and temperature in Rollover Bay, 2 parallel model runs, with and without the

Rollover Pass closure, were performed. These parallel runs quantitatively demonstrated the water salinity and temperature changes caused by the Rollover Pass closure. Figure 30 presents the NGOFS2 simulated temperature (upper panels) and salinity (lower panels) contours with overlapping current vectors with Rollover Pass opened (left panels) and closed (right panels) during the flood tide on February 20, 2020. When Rollover Pass was closed during the flood tide, the high temperature (in the winter) and high salinity coastal water was blocked from moving into Rollover Bay via Rollover Pass. This led to lower water temperature and salinity in the bay as compared to the simulations when Rollover Pass was open. Following the same analysis, during flood tide in the summer, the temperature in Rollover Bay for the Rollover Pass closure will be higher when compared with the temperature simulated from the open Rollover Pass.
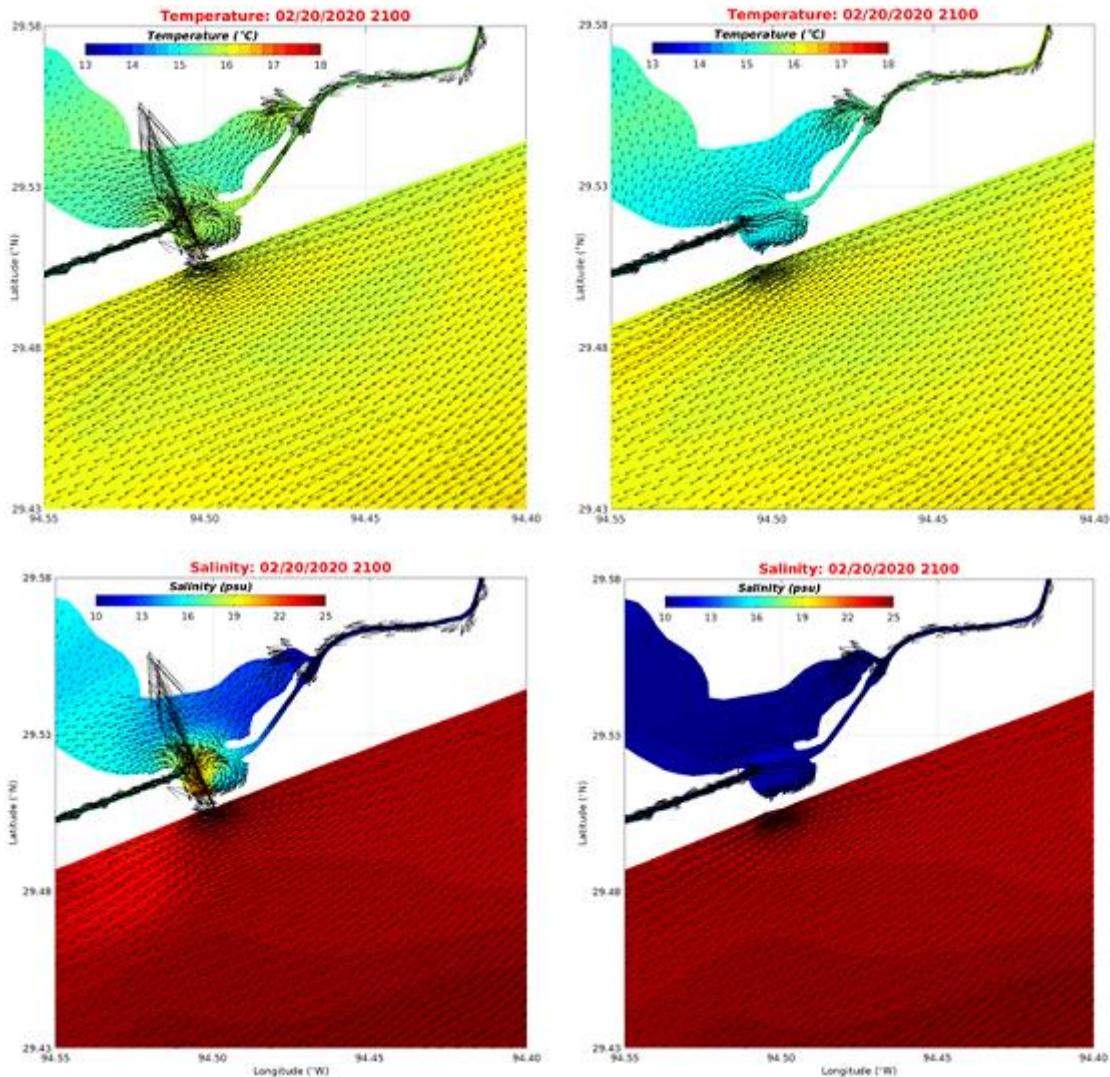
Figure 30. Upgraded Northern Gulf of Mexico Observational Forecast System (NGOFS2) simulated temperature (upper panels) and salinity (lower panels) contours overlapping current vectors with Rollover Pass open (left panels) and closed (right panels) during flood tide on February 20, 2020.

To quantitatively evaluate the temperature and salinity change before and after the Rollover Pass closure, Figure 31 provides the time series of the NGOFS2 simulated near-surface water salinity and temperature at the Rollover Pass NWLON station (ID: 8770971) for the scenarios of Rollover Pass with and without the closure from February 7, 2020, to February 21, 2020. While

the difference in water temperature between the 2 scenarios is less than 3ºF, the difference in salinity between the 2 scenarios can be as high as 8 psu, which is biologically significant. A large delta in salinity implies that the biological communities in the Rollover Bay and East Bay will be impacted to some degree by the Rollover Pass closure in January 2020.
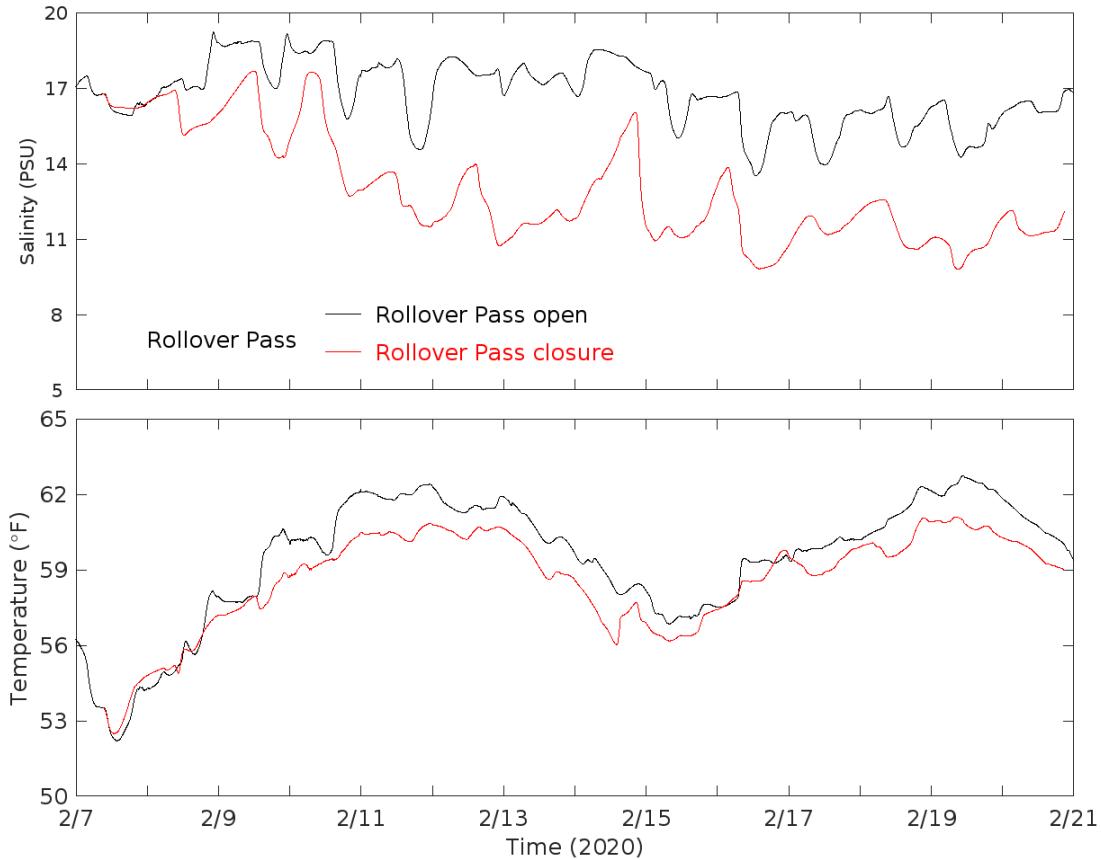
Figure 31. Time series of the upgraded Northern Gulf of Mexico Observational Forecast System (NGOFS2) simulated near-surface water salinity (upper panel) and water temperature (lower panel) at the Rollover Pass National Water Level Observation Network (NWLON) station (shown in Figure 29) for the scenarios of Rollover Pass with (red lines) and without (black lines) closure from February 7, 2020, to February 21, 2020.

5.2 NGOFS2 Performance during the 2020 and 2021 Hurricane Seasons

During the 2 active hurricane seasons of 2020 and 2021, there were many hurricanes—including Hurricanes Hanna, Laura, Sally, Delta, and Zeta in 2020 and Ida and Nicholas in 2021—that made landfall in the NGOFS2 model domain. In this report, Figure 32 shows the comparisons of time series of modeled and observed water levels for Hurricanes Hanna, Laura, Sally, and Zeta in 2020 and Ida and Nicholas in 2021. Generally, the NGOFS2 accurately simulated times and heights of elevated water levels for all of the 6 selected hurricanes. Although the NGOFS2 performed well during these extreme events, the model is not specifically designed to provide elevated water level advisories. The model grid does not extend landward enough to allow the land to be inundated, which may lead to an overestimation of the water level. Also, the NGOFS2 uses NAM 12 km for wind forcing. The low-resolution NAM usually underestimates wind speeds, which may cause the water levels to be underestimated during hurricane or tropical storm events. Official storm surge forecasts are provided by NOAA's National Hurricane Center (www.nhc.noaa.gov). To improve the prediction of water levels during extreme events, the model

requires higher resolution wind forcings, higher grid resolution, and an extension of the model grid onto the land to allow water to move over the land, which is beyond the scope of this project.
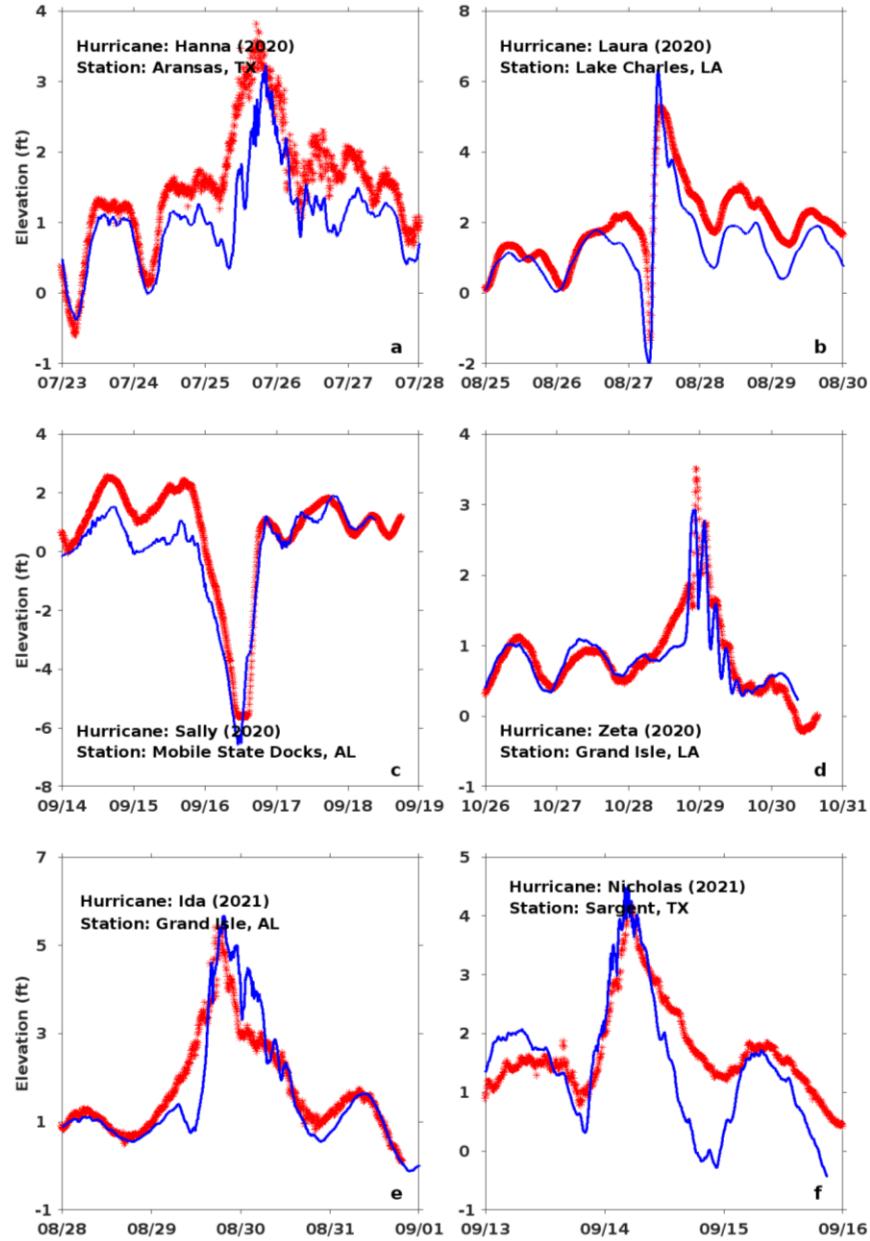
Figure 32. Time series comparisons of the upgraded Northern Gulf of Mexico Observational Forecast System (NGOFS2) simulated (blue lines) and observed (red stars) water levels during hurricanes of 2020: (a) Hanna; (b) Laura; (c) Sally; and (d) Zeta; and the hurricanes of 2021: (e) Ida and (f) Nicholas.

6. CONCLUSIONS

NOS/OCS developed NGOFS2 and performed the tide simulation harmonic analysis and hindcast simulation skill assessments (Yang et al. 2022). Compared with the existing NGOFS, NGOFS2 shows slight improvements in performance on the tide and hindcast simulations. The NGOFS2 quasi-operational N/F runs began in May 2019, and operational N/F runs began in March 2021. The NGOFS2 outputs for the period of March 15, 2020, through March 15, 2021, were used for the model's N/F skill assessment using the NOS standard skill assessment package. CO-OPS successfully incorporated the NGOFS2 model configuration into the HPC-COMF package and implemented this OFS on WCOSS. The HPC-COMF automatically generates all necessary forcing files for nowcast and forecast predictions in real-time mode.

The water level skill assessment results indicate that the water level RMSEs are less than 0.15 m in all available stations except for the Calcasieu Pass, TX, station (NWLON ID: 8768094). A majority of the stations have CF values larger than 90% (NOS accepted criteria). Two factors may contribute to the relatively low CFs seen at certain locations: 1) the tides in the NGOM are relatively weak, and 2) the non-tidal sea level variations in the region are significantly impacted by extreme meteorological events, such as hurricanes and tropical storms.

The near-surface water temperature skill assessment results indicate that water temperature RMSEs are less than 3ºC at all available stations spanning the NGOFS2 model domain. Nowcast simulated near-surface water temperatures generally agree with the observations at most of the stations, as well as the diurnal, synoptic (cold frontal), and seasonal variations.

The near-surface water salinity skill assessment results indicate that salinity RMSEs at some stations is less than 3.5 psu and at some stations higher than 3.5 psu. Salinity is one of the most difficult variables to be simulated in a hydrodynamic model, which holds true for the NGOFS2 hindcast, nowcast, and forecast simulations skill assessments. To improve the model salinity simulation, the model grid would need to be extended beyond the extent of the tidal excursions of the river systems. More high quality salinity measurements are also required for validating model salinities across the entire domain.

The near-surface current speed skill assessments demonstrate good performance at certain locations (e.g. the RMSEs are less than 0.26 m/s) and degraded performance at other locations (e.g. the RMSEs are larger than 0.26 m/s). Generally speaking, the NGOFS2 performs good current simulations in the continental shelf, but the performance degrades in inlets where the current speeds are strong. To improve current simulations, the model requires a higher model grid resolution to resolve the topography of navigation channels, and it also requires updated, accurate bathymetric data to interpolate to the model grid.

The NGOFS2 can be applied to evaluate environmental impacts related to coastal changes, such as coastal reclamation, inlet or pass opening or closing, and navigation channel dredging. It can also provide forecast guidance of elevated water levels when a hurricane makes landfall along the Alabama, Mississippi, Louisiana, and Texas coasts.

The successful implementation of NGOFS2 provides reliable forecast guidance on water levels, 3-D currents, temperatures, and salinities to support NOS' navigation missions, USCG search and rescue missions, fisheries research, hypoxia studies, HAB tracking, and academic research.

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APPENDIX A: WATER LEVEL SKILL ASSESSMENT METRICS TABLES

Table A1: Water level skill assessment metrics at Port Aransas, TX.
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			87453	0.190									
h			87453	0.184									
H-h	15 cm	24 h	87543	0.006	0.115	0.115	1.6	83.6	0.3	47.1	3.9	0.29	0.88
AHW-ahw	15 cm	24 h	265	-0.032	0.109	0.104	1.9	85.7	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	365	0.081	0.148	0.124	0.5	69.3	4.4	0.0	23.8		
THW-thw	0.50 h	25 h	265	0.723	1.447	1.255	8.3	22.6	40.4	0.0	19.5		
TLW-tlw	0.50 h	25 h	365	0.453	1.175	1.085	8.8	28.5	31.2	0.0	48.4		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	0.007	0.117	0.117	1.6	81.9	0.3	42.0	0.0	0.28	
H006-h006	15 cm	24 h	1404	0.007	0.117	0.117	1.6	82.3	0.3	42.0	0.0	0.28	
H012-h012	15 cm	24 h	1404	0.007	0.117	0.116	1.6	82.1	0.4	42.0	0.0	0.36	
H018-h018	15 cm	24 h	1404	0.007	0.117	0.116	1.6	82.3	0.4	42.0	0.0	0.36	
H024-h024	15 cm	24 h	1404	0.005	0.117	0.117	1.7	82.8	0.4	42.0	0.0	0.28	
H030-h030	15 cm	24 h	1403	0.005	0.118	0.118	1.9	82.8	0.4	42.0	0.0	0.36	
H036-h036	15 cm	24 h	1402	0.004	0.118	0.117	1.7	83.0	0.4	36.0	0.0	0.29	
H042-h042	15 cm	24 h	1401	0.004	0.117	0.117	1.9	81.9	0.4	30.0	0.0	0.29	
H048-h048	15 cm	24 h	1400	0.002	0.118	0.118	1.8	82.2	0.4	30.0	0.0	0.29	
AHW-ahw	15 cm	24 h	247	-0.039	0.118	0.111	2.4	82.2	0.0				
ALW-alw	15 cm	24 h	339	0.081	0.153	0.131	0.9	68.1	4.7				
THW-thw	0.50 h	25 h	247	0.665	1.408	1.243	19.3	22.7	40.1				
TLW-tlw	0.50 h	25 h	339	0.375	1.128	1.066	10.0	30.7	26.8				

Table A2: Water level skill assessment metrics at Port O'Connor, TX
Observed data time period from: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H		87453	0.188										
h		87453	0.170										
H-h	15 cm	24 h	87453	0.017	0.117	0.115	1.8	83.3	0.2	46.3	11.8	0.01	0.86
AHW-ahw	15 cm	24 h	286	-0.007	0.110	0.110	1.7	87.1	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	334	0.053	0.121	0.109	0.9	82.3	0.6	0.0	0.0		
THW-thw	0.50 h	25 h	286	0.690	1.409	1.231	9.1	22.7	41.3	0.0	48.4		
TLW-tlw	0.50 h	25 h	334	0.729	1.218	0.977	5.1	23.4	39.2	0.0	74.1		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	0.017	0.118	0.117	1.8	82.7	0.1	54.0	6.0	0.00	
H006-h006	15 cm	24 h	1404	0.017	0.118	0.117	1.7	82.8	0.1	54.0	6.0	0.00	
H012-h012	15 cm	24 h	1404	0.018	0.119	0.117	1.6	82.7	0.3	48.0	6.0	0.07	
H018-h018	15 cm	24 h	1404	0.018	0.119	0.118	1.9	82.8	0.4	66.0	6.0	0.14	
H024-h024	15 cm	24 h	1404	0.018	0.119	0.118	1.6	83.1	0.2	42.0	6.0	0.00	
H030-h030	15 cm	24 h	1403	0.016	0.119	0.118	1.6	83.0	0.2	42.0	6.0	0.00	
H036-h036	15 cm	24 h	1402	0.016	0.119	0.118	1.8	83.0	0.3	48.0	6.0	0.07	
H042-h042	15 cm	24 h	1401	0.015	0.120	0.119	2.0	83.0	0.3	48.0	6.0	0.07	
H048-h048	15 cm	24 h	1400	0.014	0.119	0.118	1.9	82.9	0.3	48.0	6.0	0.07	
AHW-ahw	15 cm	24 h	273	-0.007	0.115	0.115	2.2	85.7	0.0				
ALW-alw	15 cm	24 h	318	0.055	0.121	0.108	0.6	81.4	0.6				
THW-thw	0.50 h	25 h	273	0.860	1.487	1.215	8.1	22.7	50.2				
TLW-tlw	0.50 h	25 h	318	0.726	1.217	0.978	5.0	27.4	38.7				

Table A3: Water level skill assessment metrics at Eagle Point, TX.
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H		87453	0.283										
h		87453	0.241										
H-h	15 cm	24 h	87453	0.043	0.130	0.122	1.4	78.6	1.5	41.1	13.4	0.69	0.90
AHW-ahw	15 cm	24 h	312	-0.012	0.111	0.110	1.6	83.7	0.0	16.6	0.0		
ALW-alw	15 cm	24 h	365	0.108	0.162	0.121	0.5	64.7	6.6	0.0	23.5		
THW-thw	0.50 h	25 h	312	0.831	1.442	1.180	5.8	27.6	44.2	12.4	71.0		
TLW-tlw	0.50 h	25 h	365	0.436	1.028	0.933	6.6	31.2	26.0	0.0	24.8		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	0.042	0.131	0.124	1.5	78.7	1.9	36.0	12.0	0.78	
H006-h006	15 cm	24 h	1404	0.044	0.132	0.124	1.6	78.2	2.0	54.0	12.0	0.78	
H012-h012	15 cm	24 h	1404	0.047	0.133	0.125	1.3	77.4	2.2	24.0	12.0	1.00	
H018-h018	15 cm	24 h	1404	0.048	0.134	0.125	1.4	77.4	2.2	36.0	12.0	1.00	
H024-h024	15 cm	24 h	1404	0.046	0.132	0.124	1.4	77.6	2.1	24.0	6.0	1.07	
H030-h030	15 cm	24 h	1403	0.045	0.131	0.124	1.0	77.0	2.0	18.0	12.0	0.86	
H036-h036	15 cm	24 h	1402	0.045	0.132	0.125	1.0	76.5	2.3	18.0	12.0	1.07	
H042-h042	15 cm	24 h	1401	0.044	0.132	0.124	1.1	77.4	2.4	18.0	12.0	1.14	
H048-h048	15 cm	24 h	1400	0.043	0.132	0.125	1.3	77.4	1.9	18.0	6.0	0.93	
AHW-ahw	15 cm	24 h	309	-0.011	0.113	0.113	1.6	82.5	0.0				
ALW-alw	15 cm	24 h	349	0.112	0.166	0.123	0.6	64.2	7.4				
THW-thw	0.50 h	25 h	309	0.934	1.509	1.186	7.1	22.7	47.9				
TLW-tlw	0.50 h	25 h	349	0.465	1.018	0.906	5.7	31.8	24.6				

Table A4: Water level skill assessment metrics at Port Fourchon, LA.
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			87453	0.126									
h			87453	0.113									
H-h	15 cm	24 h	87453	0.013	0.114	0.114	0.8	82.0	0.1	36.8	3.2	0.09	0.90
AHW-ahw	15 cm	24 h	324	0.004	0.114	0.114	0.6	84.0	0.3	0.0	0.0		
ALW-alw	15 cm	24 h	333	0.038	0.115	0.109	0.3	77.8	0.0	0.0	0.0		
THW-thw	0.50 h	25 h	324	-0.415	1.277	1.210	32.4	27.8	12.7	24.8	0.0		
TLW-tlw	0.50 h	25 h	333	-0.448	1.154	1.066	27.0	30.9	6.9	36.4	46.6		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	0.013	0.117	0.116	0.8	81.1	0.1	36.0	0.0	0.14	
H006-h006	15 cm	24 h	1404	0.013	0.115	0.114	0.8	81.6	0.1	36.0	6.0	0.14	
H012-h012	15 cm	24 h	1404	0.014	0.116	0.115	0.9	81.5	0.1	18.0	6.0	0.14	
H018-h018	15 cm	24 h	1404	0.013	0.117	0.116	1.0	81.1	0.1	36.0	6.0	0.21	
H024-h024	15 cm	24 h	1404	0.012	0.117	0.116	1.0	82.1	0.1	42.0	6.0	0.28	
H030-h030	15 cm	24 h	1403	0.012	0.116	0.116	0.9	81.9	0.2	36.0	6.0	0.21	
H036-h036	15 cm	24 h	1402	0.012	0.117	0.116	0.9	81.5	0.4	30.0	6.0	0.43	
H042-h042	15 cm	24 h	1401	0.012	0.117	0.116	0.8	82.1	0.4	12.0	6.0	0.36	
H048-h048	15 cm	24 h	1400	0.012	0.117	0.117	0.9	81.5	0.5	30.0	6.0	0.57	
AHW-ahw	15 cm	24 h	314	0.000	0.113	0.113	0.6	83.4	0.3				
ALW-alw	15 cm	24 h	329	0.039	0.118	0.111	0.3	77.2	0.0				
THW-thw	0.50 h	25 h	314	-0.384	1.255	1.196	32.2	27.7	12.1				
TLW-tlw	0.50 h	25 h	329	-0.477	1.147	1.045	27.4	29.5	8.8				

Table A5: Water level skill assessment metrics at Dauphin Island, AL.
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			87453	0.148									
h			87453	0.194									
H-h	15 cm	24 h	87453	-0.046	0.112	0.103	1.3	86.1	0.0	35.5	0.1	0.04	0.91
AHW-ahw	15 cm	24 h	332	-0.059	0.116	0.100	0.9	81.3	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	336	-0.022	0.102	0.100	0.9	88.7	0.0	0.0	0.0		
THW-thw	0.50 h	25 h	332	0.313	1.088	1.044	8.7	33.1	25.0	0.0	48.4		
TLW-tlw	0.50 h	25 h	336	-0.057	1.216	1.217	21.4	30.7	22.0	40.2	37.0		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	-0.044	0.113	0.104	1.2	85.9	0.0	30.0	0.0	0.00	
H006-h006	15 cm	24 h	1404	-0.044	0.111	0.102	1.1	86.3	0.0	24.0	0.0	0.00	
H012-h012	15 cm	24 h	1404	-0.044	0.115	0.106	1.4	84.4	0.0	24.0	0.0	0.07	
H018-h018	15 cm	24 h	1404	-0.045	0.116	0.107	1.4	83.0	0.1	30.0	0.0	0.14	
H024-h024	15 cm	24 h	1404	-0.045	0.117	0.108	1.4	81.8	0.1	24.0	0.0	0.07	
H030-h030	15 cm	24 h	1403	-0.045	0.118	0.109	1.3	81.6	0.1	24.0	0.0	0.07	
H036-h036	15 cm	24 h	1402	-0.046	0.120	0.111	1.4	80.7	0.1	24.0	0.0	0.07	
H042-h042	15 cm	24 h	1401	-0.047	0.123	0.113	1.4	79.8	0.1	42.0	0.0	0.07	
H048-h048	15 cm	24 h	1400	-0.048	0.124	0.114	1.4	79.0	0.1	54.0	0.0	0.14	
AHW-ahw	15 cm	24 h	317	-0.059	0.120	0.105	0.9	79.5	0.0				
ALW-alw	15 cm	24 h	323	-0.016	0.104	0.103	0.6	87.3	0.0				
THW-thw	0.50 h	25 h	317	0.286	1.089	1.052	10.1	34.7	25.9				
TLW-tlw	0.50 h	25 h	323	-0.050	1.225	1.226	21.1	28.5	22.0				

Table A6: Water level skill assessment metrics at Pensacola, FL.
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.60 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87310	0.164									
h			87310	0.185									
H-h	15 cm	24 h	87310	-0.021	0.101	0.099	0.7	89.0	0.0	39.8	0.0	0.00	0.93
AHW-ahw	15 cm	24 h	367	0.001	0.091	0.091	0.8	92.1	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	354	-0.041	0.102	0.094	0.6	91.5	0.0	21.6	0.0		
THW-thw	0.50 h	25 h	367	-0.312	0.949	0.897	17.2	37.3	8.2	24.7	0.0		
TLW-tlw	0.50 h	25 h	354	-0.822	1.256	0.951	40.7	22.9	4.5	47.3	0.0		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1401	-0.021	0.101	0.099	0.6	89.2	0.0	54.0	0.0	0.00	
H006-h006	15 cm	24 h	1401	-0.020	0.101	0.099	0.7	89.7	0.0	60.0	0.0	0.00	
H012-h012	15 cm	24 h	1401	-0.021	0.103	0.101	0.9	88.2	0.0	60.0	0.0	0.00	
H018-h018	15 cm	24 h	1401	-0.022	0.107	0.105	0.8	88.0	0.1	60.0	0.0	0.14	
H024-h024	15 cm	24 h	1401	-0.023	0.111	0.109	0.9	85.9	0.3	60.0	6.0	0.29	
H030-h030	15 cm	24 h	1400	-0.024	0.113	0.110	1.0	85.4	0.3	60.0	6.0	0.29	
H036-h036	15 cm	24 h	1399	-0.024	0.114	0.112	1.0	84.7	0.1	60.0	0.0	0.14	
H042-h042	15 cm	24 h	1398	-0.025	0.117	0.114	0.9	83.8	0.1	60.0	0.0	0.07	
H048-h048	15 cm	24 h	1397	-0.027	0.120	0.117	1.1	82.1	0.4	72.0	6.0	0.43	
AHW-ahw	15 cm	24 h	358	-0.003	0.098	0.098	0.8	90.5	0.0				
ALW-alw	15 cm	24 h	340	-0.037	0.100	0.093	0.3	91.2	0.0				
THW-thw	0.50 h	25 h	358	-0.344	1.002	0.942	21.8	36.9	6.7				
TLW-tlw	0.50 h	25 h	340	-0.873	1.290	0.951	45.0	24.1	2.9				

Table A7: Water level skill assessment metrics at South Padre Island, TX.
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.217									
h			87453	0.202									
H-h	15 cm	24 h	87453	0.015	0.116	0.115	0.7	81.8	1.1	13.0	13.0	0.34	0.90
AHW-ahw	15 cm	24 h	360	-0.016	0.107	0.106	0.6	84.4	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	391	0.056	0.127	0.114	0.0	78.0	3.3	0.0	49.2		
THW-thw	0.50 h	25 h	360	0.512	1.218	1.107	7.5	27.8	32.8	23.3	120.2		
TLW-tlw	0.50 h	25 h	391	0.382	0.953	0.874	5.9	35.5	22.3	12.9	64.8		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	0.014	0.117	0.116	0.9	81.8	1.2	18.0	12.0	0.50	
H006-h006	15 cm	24 h	1404	0.013	0.117	0.116	0.9	81.3	1.5	18.0	12.0	0.43	
H012-h012	15 cm	24 h	1404	0.011	0.118	0.118	0.9	81.8	1.6	12.0	12.0	0.57	
H018-h018	15 cm	24 h	1404	0.010	0.118	0.118	0.9	82.1	1.6	18.0	12.0	0.78	
H024-h024	15 cm	24 h	1404	0.010	0.118	0.118	1.0	82.1	1.4	24.0	12.0	0.64	
H030-h030	15 cm	24 h	1403	0.011	0.117	0.117	0.6	82.0	1.5	18.0	12.0	0.50	
H036-h036	15 cm	24 h	1402	0.011	0.117	0.117	0.6	81.7	1.4	18.0	12.0	0.57	
H042-h042	15 cm	24 h	1401	0.010	0.117	0.117	0.7	81.7	1.4	24.0	12.0	0.50	
H048-h048	15 cm	24 h	1400	0.009	0.117	0.116	0.6	81.9	1.3	24.0	6.0	0.43	
AHW-ahw	15 cm	24 h	334	-0.018	0.109	0.107	0.6	82.9	0.0				
ALW-alw	15 cm	24 h	373	0.053	0.126	0.115	0.0	79.1	3.5				
THW-thw	0.50 h	25 h	334	0.500	1.218	1.112	9.6	27.5	33.2				
TLW-tlw	0.50 h	25 h	373	0.368	0.954	0.881	6.7	38.6	22.0				

Table A8: Water level skill assessment metrics at Port Isabel, TX.
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			87453	0.228									
h			87453	0.210									
H-h	15 cm	24 h	87453	0.018	0.116	0.115	0.8	81.5	1.3	11.5	13.8	0.28	0.90
AHW-ahw	15 cm	24 h	354	-0.008	0.108	0.108	0.6	82.8	0.6	0.0	0.0		
ALW-alw	15 cm	24 h	389	0.052	0.129	0.118	0.3	77.9	2.8	0.0	0.0		
THW-thw	0.50 h	25 h	354	0.503	1.150	1.036	6.8	27.7	29.1	0.0	48.4		
TLW-tlw	0.50 h	25 h	389	0.107	0.924	0.919	11.3	36.0	13.1	24.0	24.7		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	0.020	0.119	0.117	0.8	80.5	1.4	18.0	12.0	0.50	
H006-h006	15 cm	24 h	1404	0.019	0.119	0.117	0.8	80.5	1.9	18.0	12.0	0.50	
H012-h012	15 cm	24 h	1404	0.017	0.119	0.118	0.6	80.8	1.9	12.0	24.0	0.43	
H018-h018	15 cm	24 h	1404	0.016	0.119	0.118	0.6	81.8	1.6	12.0	12.0	0.50	
H024-h024	15 cm	24 h	1404	0.016	0.119	0.118	0.7	81.3	1.6	24.0	12.0	0.43	
H030-h030	15 cm	24 h	1403	0.017	0.119	0.118	0.6	81.8	1.7	18.0	12.0	0.43	
H036-h036	15 cm	24 h	1402	0.017	0.119	0.118	0.5	82.1	1.9	18.0	24.0	0.50	
H042-h042	15 cm	24 h	1401	0.016	0.119	0.118	0.6	81.7	1.6	24.0	12.0	0.50	
H048-h048	15 cm	24 h	1400	0.015	0.118	0.117	0.4	82.1	1.5	24.0	6.0	0.64	
AHW-ahw	15 cm	24 h	346	-0.010	0.109	0.108	0.3	82.4	0.6				
ALW-alw	15 cm	24 h	372	0.050	0.128	0.118	0.3	79.0	3.5				
THW-thw	0.50 h	25 h	346	0.501	1.191	1.082	6.9	28.3	32.4				
TLW-tlw	0.50 h	25 h	372	0.068	0.915	0.914	12.1	39.0	14.2				

Table A9: Water level skill assessment metrics at SPI Brazos Santiago, TX.
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			87453	0.221									
h			87453	0.205									
H-h	15 cm	24 h	87453	0.016	0.107	0.106	0.5	84.3	0.4	8.1	4.7	0.15	0.92
AHW-ahw	15 cm	24 h	363	-0.008	0.103	0.103	0.6	84.3	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	391	0.049	0.116	0.105	0.3	80.8	1.0	0.0	0.0		
THW-thw	0.50 h	25 h	363	0.455	1.200	1.112	9.4	32.0	29.2	0.0	49.4		
TLW-tlw	0.50 h	25 h	391	0.306	0.989	0.941	7.2	34.8	19.7	0.0	24.8		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	0.015	0.107	0.106	0.6	84.3	0.1	6.0	0.0	0.07	
H006-h006	15 cm	24 h	1404	0.014	0.107	0.106	0.6	83.8	0.3	6.0	6.0	0.14	
H012-h012	15 cm	24 h	1404	0.013	0.107	0.107	0.5	83.5	0.5	6.0	6.0	0.21	
H018-h018	15 cm	24 h	1404	0.012	0.107	0.106	0.6	83.9	0.4	6.0	6.0	0.28	
H024-h024	15 cm	24 h	1404	0.012	0.107	0.106	0.5	84.5	0.4	6.0	6.0	0.28	
H030-h030	15 cm	24 h	1403	0.012	0.107	0.107	0.4	84.4	0.4	6.0	6.0	0.21	
H036-h036	15 cm	24 h	1402	0.012	0.108	0.107	0.4	84.0	0.4	12.0	6.0	0.21	
H042-h042	15 cm	24 h	1401	0.011	0.107	0.107	0.4	84.2	0.4	18.0	6.0	0.29	
H048-h048	15 cm	24 h	1400	0.010	0.107	0.107	0.6	84.4	0.3	24.0	6.0	0.21	
AHW-ahw	15 cm	24 h	354	-0.014	0.104	0.103	0.6	84.2	0.0				
ALW-alw	15 cm	24 h	379	0.047	0.115	0.106	0.3	81.8	1.6				
THW-thw	0.50 h	25 h	354	0.438	1.167	1.083	8.2	33.9	28.2				
TLW-tlw	0.50 h	25 h	379	0.287	0.971	0.929	7.9	35.4	18.7				

Table A10: Water level skill assessment metrics at Corpus Christi, TX.
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.207									
h			87453	0.213									
H-h	15 cm	24 h	87453	-0.006	0.126	0.126	2.1	80.7	0.4	43.9	4.7	0.34	0.91
AHW-ahw	15 cm	24 h	369	-0.063	0.134	0.119	4.1	77.5	0.0	47.2	0.0		
ALW-alw	15 cm	24 h	388	0.038	0.126	0.120	1.3	79.4	1.5	0.0	0.0		
THW-thw	0.50 h	25 h	369	0.634	1.285	1.119	7.0	23.6	36.0	25.8	73.1		
TLW-tlw	0.50 h	25 h	388	0.188	1.063	1.048	11.1	32.7	20.1	48.1	35.4		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	-0.005	0.128	0.128	2.2	79.8	0.3	42.0	0.0	0.28	
H006-h006	15 cm	24 h	1404	-0.005	0.126	0.126	2.1	79.9	0.4	42.0	0.0	0.36	
H012-h012	15 cm	24 h	1404	-0.006	0.126	0.126	2.1	79.9	0.5	42.0	6.0	0.43	
H018-h018	15 cm	24 h	1404	-0.008	0.129	0.129	2.4	79.0	0.5	42.0	6.0	0.43	
H024-h024	15 cm	24 h	1404	-0.011	0.131	0.131	2.3	79.6	0.4	42.0	6.0	0.43	
H030-h030	15 cm	24 h	1403	-0.011	0.132	0.132	2.4	79.3	0.4	42.0	0.0	0.36	
H036-h036	15 cm	24 h	1402	-0.011	0.132	0.131	2.6	79.6	0.4	42.0	0.0	0.36	
H042-h042	15 cm	24 h	1401	-0.012	0.131	0.130	2.4	79.5	0.4	30.0	0.0	0.36	
H048-h048	15 cm	24 h	1400	-0.014	0.133	0.132	2.1	79.7	0.4	24.0	0.0	0.36	
AHW-ahw	15 cm	24 h	364	-0.066	0.140	0.123	4.9	76.4	0.0				
ALW-alw	15 cm	24 h	378	0.040	0.126	0.120	1.1	79.1	1.9				
THW-thw	0.50 h	25 h	364	0.630	1.261	1.093	5.8	26.4	34.9				
TLW-tlw	0.50 h	25 h	378	0.238	1.032	1.006	9.3	35.7	21.7				

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Table A11: Water level skill assessment metrics at Packery Channel, TX.
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			87453	0.185									
h			87453	0.184									
H-h	15 cm	24 h	87453	0.000	0.113	0.113	2.0	86.6	0.0	86.5	0.0	0.29	0.82
AHW-ahw	15 cm	24 h	305	0.017	0.119	0.118	2.3	84.9	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	328	-0.030	0.112	0.108	2.7	89.3	0.0	0.0	0.0		
THW-thw	0.50 h	25 h	305	-0.189	1.308	1.296	25.9	26.6	18.7	27.6	0.0		
TLW-tlw	0.50 h	25 h	328	0.331	1.307	1.266	15.2	22.3	34.8	24.7	48.9		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	-0.002	0.114	0.114	2.1	86.3	0.0	90.0	0.0	0.28	
H006-h006	15 cm	24 h	1404	-0.001	0.113	0.113	1.9	86.9	0.0	84.0	0.0	0.21	
H012-h012	15 cm	24 h	1404	-0.002	0.112	0.112	1.9	86.8	0.0	84.0	0.0	0.28	
H018-h018	15 cm	24 h	1404	-0.001	0.112	0.112	1.9	87.0	0.0	84.0	0.0	0.36	
H024-h024	15 cm	24 h	1404	-0.001	0.113	0.113	1.9	86.2	0.0	78.0	0.0	0.28	
H030-h030	15 cm	24 h	1403	-0.002	0.114	0.114	1.8	86.6	0.1	66.0	0.0	0.29	
H036-h036	15 cm	24 h	1402	-0.003	0.113	0.113	1.9	86.1	0.1	60.0	0.0	0.43	
H042-h042	15 cm	24 h	1401	-0.004	0.113	0.113	1.8	86.2	0.1	54.0	0.0	0.36	
H048-h048	15 cm	24 h	1400	-0.005	0.114	0.114	1.6	85.6	0.1	30.0	0.0	0.21	
AHW-ahw	15 cm	24 h	294	0.019	0.118	0.117	2.0	84.7	0.0				
ALW-alw	15 cm	24 h	313	-0.027	0.107	0.103	1.6	89.1	0.0				
THW-thw	0.50 h	25 h	294	-0.198	1.385	1.373	29.6	23.5	20.7				
TLW-tlw	0.50 h	25 h	313	0.407	1.352	1.292	15.7	19.5	37.1				

Table A12: Water level skill assessment metrics at Lexington Corpus Christi Bay, TX.
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE CRITERION	X -	N -	IMAX -	SM -	RMSE -	SD -	NOF <1%	CF >90%	POF <1%	MDNO <N	MDPO <N	WOF <.5%	SKILL
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			87453	0.195									
h			87453	0.168									
H-h	15 cm	24 h	87453	0.026	0.114	0.111	1.2	81.4	0.1	44.3	3.2	0.10	0.86
AHW-ahw	15 cm	24 h	318	0.016	0.107	0.106	0.9	83.6	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	353	0.042	0.122	0.114	0.8	79.0	0.8	0.0	0.0		
THW-thw	0.50 h	25 h	318	-0.313	1.255	1.217	29.2	22.3	17.0	0.0	0.0		
TLW-tlw	0.50 h	25 h	353	-0.153	0.985	0.975	17.3	39.1	9.9	49.0	0.0		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	0.026	0.116	0.113	1.3	79.9	0.2	54.0	6.0	0.14	
H006-h006	15 cm	24 h	1404	0.028	0.116	0.113	1.0	80.3	0.4	30.0	18.0	0.28	
H012-h012	15 cm	24 h	1404	0.028	0.116	0.112	1.1	80.5	0.4	30.0	24.0	0.36	
H018-h018	15 cm	24 h	1404	0.026	0.116	0.114	1.1	81.3	0.5	36.0	24.0	0.50	
H024-h024	15 cm	24 h	1404	0.025	0.118	0.115	1.1	81.6	0.4	36.0	24.0	0.36	
H030-h030	15 cm	24 h	1403	0.024	0.119	0.116	1.4	81.2	0.4	36.0	6.0	0.29	
H036-h036	15 cm	24 h	1402	0.023	0.119	0.116	1.1	81.1	0.4	30.0	12.0	0.29	
H042-h042	15 cm	24 h	1401	0.022	0.118	0.116	1.2	81.3	0.3	30.0	6.0	0.21	
H048-h048	15 cm	24 h	1400	0.021	0.118	0.116	1.1	81.2	0.4	24.0	12.0	0.36	
AHW-ahw	15 cm	24 h	305	0.016	0.109	0.108	1.0	84.3	0.0				
ALW-alw	15 cm	24 h	343	0.043	0.122	0.114	0.9	79.3	1.2				
THW-thw	0.50 h	25 h	305	-0.293	1.339	1.308	32.8	22.3	16.7				
TLW-tlw	0.50 h	25 h	343	-0.094	0.954	0.951	16.6	42.3	9.6				

Table A13: Water level skill assessment metrics at Aransas Pass, TX.
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.206									
h			87453	0.214									
H-h	15 cm	24 h	87453	-0.007	0.112	0.111	1.3	84.0	0.1	22.8	0.9	0.03	0.92
AHW-ahw	15 cm	24 h	373	-0.006	0.109	0.109	1.3	82.8	0.0	23.4	0.0		
ALW-alw	15 cm	24 h	385	0.009	0.109	0.108	0.8	85.7	0.3	0.0	0.0		
THW-thw	0.50 h	25 h	373	0.568	1.329	1.203	10.7	24.7	36.7	0.0	49.3		
TLW-tlw	0.50 h	25 h	385	0.172	1.062	1.049	11.4	36.6	21.3	24.8	36.8		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	-0.005	0.113	0.113	1.4	83.4	0.0	42.0	0.0	0.00	
H006-h006	15 cm	24 h	1404	-0.005	0.113	0.113	1.4	83.9	0.1	36.0	0.0	0.00	
H012-h012	15 cm	24 h	1404	-0.005	0.113	0.113	1.4	84.0	0.0	42.0	0.0	0.00	
H018-h018	15 cm	24 h	1404	-0.007	0.114	0.113	1.5	82.7	0.0	42.0	0.0	0.00	
H024-h024	15 cm	24 h	1404	-0.009	0.114	0.114	1.8	82.8	0.0	42.0	0.0	0.00	
H030-h030	15 cm	24 h	1403	-0.009	0.115	0.114	1.8	82.7	0.0	42.0	0.0	0.00	
H036-h036	15 cm	24 h	1402	-0.010	0.115	0.114	1.6	82.5	0.0	36.0	0.0	0.00	
H042-h042	15 cm	24 h	1401	-0.011	0.114	0.113	1.6	82.6	0.0	42.0	0.0	0.00	
H048-h048	15 cm	24 h	1400	-0.013	0.115	0.115	1.6	83.3	0.0	30.0	0.0	0.00	
AHW-ahw	15 cm	24 h	348	-0.011	0.111	0.110	1.4	82.8	0.0				
ALW-alw	15 cm	24 h	375	0.013	0.110	0.109	1.1	84.8	0.0				
THW-thw	0.50 h	25 h	348	0.531	1.282	1.168	10.6	28.7	35.9				
TLW-tlw	0.50 h	25 h	375	0.198	1.023	1.005	11.2	35.5	22.1				

Table A14: Water level skill assessment metrics at Rockport, TX.
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			87453	0.184									
h			87453	0.155									
H-h	15 cm	24 h	87453	0.029	0.111	0.107	1.1	84.5	0.0	38.4	0.0	0.00	0.83
AHW-ahw	15 cm	24 h	299	0.039	0.112	0.105	1.0	83.9	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	317	0.029	0.102	0.098	0.3	86.4	0.0	0.0	0.0		
THW-thw	0.50 h	25 h	299	0.102	1.320	1.318	20.1	25.1	24.4	0.0	21.4		
TLW-tlw	0.50 h	25 h	317	0.250	1.117	1.090	11.0	29.3	20.2	0.0	0.0		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	0.029	0.113	0.109	1.2	83.6	0.0	30.0	0.0	0.00	
H006-h006	15 cm	24 h	1404	0.030	0.114	0.110	1.2	83.5	0.0	36.0	0.0	0.00	
H012-h012	15 cm	24 h	1404	0.031	0.114	0.110	0.9	83.3	0.0	30.0	0.0	0.00	
H018-h018	15 cm	24 h	1404	0.032	0.113	0.109	1.1	82.9	0.0	36.0	0.0	0.00	
H024-h024	15 cm	24 h	1404	0.031	0.113	0.108	0.9	83.3	0.1	30.0	0.0	0.00	
H030-h030	15 cm	24 h	1403	0.030	0.113	0.109	1.0	83.3	0.1	42.0	0.0	0.00	
H036-h036	15 cm	24 h	1402	0.030	0.113	0.109	0.9	83.5	0.1	30.0	0.0	0.00	
H042-h042	15 cm	24 h	1401	0.029	0.113	0.109	0.9	84.2	0.1	30.0	0.0	0.00	
H048-h048	15 cm	24 h	1400	0.028	0.113	0.110	1.1	83.6	0.1	42.0	6.0	0.00	
AHW-ahw	15 cm	24 h	286	0.038	0.115	0.109	1.4	82.5	0.0				
ALW-alw	15 cm	24 h	305	0.032	0.104	0.099	0.0	84.9	0.0				
THW-thw	0.50 h	25 h	286	0.187	1.367	1.357	22.4	24.8	25.2				
TLW-tlw	0.50 h	25 h	305	0.288	1.113	1.077	10.5	33.4	22.0				

Table A15: Water level skill assessment metrics at Aransas Wildlife Refuge, TX.
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 16.48 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

| VARIABLE | X | N | IMAX | SM | RMSE | SD | NOF | CF | POF | MDNO | MDPO | WOF | SKILL |
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			83499	0.187									
h			83499	0.152									
H-h	15 cm	24 h	83499	0.035	0.120	0.115	1.4	81.6	0.0	68.2	0.0	0.01	0.81
AHW-ahw	15 cm	24 h	237	0.011	0.111	0.111	0.8	84.0	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	219	0.079	0.126	0.098	0.0	75.3	0.5	0.0	0.0		
THW-thw	0.50 h	25 h	237	0.462	1.497	1.427	17.3	18.6	39.2	0.0	73.6		
TLW-tlw	0.50 h	25 h	219	0.363	1.400	1.355	16.9	23.7	32.4	0.0	23.2		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1342	0.035	0.121	0.116	1.5	81.1	0.0	66.0	0.0	0.00	
H006-h006	15 cm	24 h	1342	0.035	0.120	0.115	1.5	81.4	0.0	54.0	0.0	0.00	
H012-h012	15 cm	24 h	1342	0.035	0.121	0.116	1.6	81.4	0.0	54.0	0.0	0.00	
H018-h018	15 cm	24 h	1342	0.035	0.123	0.118	1.5	81.3	0.0	54.0	0.0	0.00	
H024-h024	15 cm	24 h	1342	0.036	0.123	0.118	1.5	81.1	0.0	54.0	0.0	0.00	
H030-h030	15 cm	24 h	1341	0.036	0.122	0.117	1.6	81.1	0.0	54.0	0.0	0.00	
H036-h036	15 cm	24 h	1340	0.036	0.122	0.117	1.2	81.5	0.0	36.0	0.0	0.00	
H042-h042	15 cm	24 h	1339	0.035	0.122	0.117	1.3	81.2	0.1	42.0	0.0	0.07	
H048-h048	15 cm	24 h	1338	0.034	0.123	0.118	1.1	81.5	0.1	36.0	0.0	0.07	
AHW-ahw	15 cm	24 h	195	0.017	0.112	0.111	1.0	83.6	0.0				
ALW-alw	15 cm	24 h	200	0.072	0.125	0.103	0.0	75.0	0.5				
THW-thw	0.50 h	25 h	195	0.375	1.623	1.583	20.0	19.0	38.5				
TLW-tlw	0.50 h	25 h	200	0.332	1.517	1.484	21.0	25.0	33.5				

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Table A16: Water level skill assessment metrics at Seadrift, TX.
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.196									
h			87453	0.157									
H-h	15 cm	24 h	87453	0.040	0.118	0.111	1.3	81.9	0.1	56.0	1.9	0.07	0.83
AHW-ahw	15 cm	24 h	292	0.023	0.113	0.111	1.4	84.2	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	277	0.072	0.124	0.101	0.7	78.7	1.1	0.0	0.0		
THW-thw	0.50 h	25 h	292	0.223	1.489	1.475	21.6	19.2	31.5	12.0	47.1		
TLW-tlw	0.50 h	25 h	277	0.389	1.473	1.423	18.1	21.7	33.2	20.0	49.1		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	0.039	0.120	0.113	1.4	82.1	0.1	48.0	0.0	0.07	
H006-h006	15 cm	24 h	1404	0.041	0.121	0.114	1.4	81.2	0.0	54.0	0.0	0.00	
H012-h012	15 cm	24 h	1404	0.043	0.121	0.114	1.4	80.4	0.1	48.0	0.0	0.07	
H018-h018	15 cm	24 h	1404	0.043	0.122	0.114	1.6	80.6	0.3	54.0	0.0	0.28	
H024-h024	15 cm	24 h	1404	0.043	0.122	0.114	1.4	80.8	0.4	54.0	6.0	0.36	
H030-h030	15 cm	24 h	1403	0.043	0.122	0.114	1.4	80.7	0.4	36.0	6.0	0.36	
H036-h036	15 cm	24 h	1402	0.043	0.122	0.114	1.4	81.2	0.4	42.0	6.0	0.43	
H042-h042	15 cm	24 h	1401	0.043	0.122	0.115	1.2	81.2	0.5	36.0	0.0	0.43	
H048-h048	15 cm	24 h	1400	0.043	0.123	0.115	1.1	80.6	0.6	36.0	0.0	0.50	
AHW-ahw	15 cm	24 h	228	0.019	0.115	0.114	1.3	82.9	0.0				
ALW-alw	15 cm	24 h	241	0.069	0.125	0.104	0.8	80.1	1.2				
THW-thw	0.50 h	25 h	228	0.317	1.459	1.428	18.9	24.1	32.9				
TLW-tlw	0.50 h	25 h	241	0.310	1.498	1.468	22.0	22.0	34.4				

Table A17: Water level skill assessment metrics at Port Lavaca, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			87453	0.184									
h			87453	0.152									
H-h	15 cm	24 h	87453	0.032	0.123	0.119	1.4	80.5	1.6	37.7	19.6	0.36	0.88
AHW-ahw	15 cm	24 h	361	-0.008	0.114	0.114	2.2	85.3	0.6	12.5	0.0		
ALW-alw	15 cm	24 h	391	0.053	0.131	0.120	1.0	77.2	3.1	0.0	0.0		
THW-thw	0.50 h	25 h	361	0.247	1.305	1.284	15.5	28.8	27.1	30.3	48.5		
TLW-tlw	0.50 h	25 h	391	-0.276	1.015	0.978	20.2	35.8	8.2	26.7	24.7		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	0.030	0.124	0.121	1.5	80.1	1.6	30.0	18.0	0.43	
H006-h006	15 cm	24 h	1404	0.033	0.125	0.120	1.3	80.0	1.7	30.0	18.0	0.43	
H012-h012	15 cm	24 h	1404	0.035	0.125	0.120	1.3	79.2	1.7	30.0	18.0	0.50	
H018-h018	15 cm	24 h	1404	0.035	0.127	0.122	1.4	79.2	1.8	30.0	18.0	0.57	
H024-h024	15 cm	24 h	1404	0.034	0.127	0.122	1.5	79.6	1.6	30.0	24.0	0.43	
H030-h030	15 cm	24 h	1403	0.033	0.128	0.124	1.5	79.5	1.8	24.0	18.0	0.71	
H036-h036	15 cm	24 h	1402	0.032	0.129	0.125	1.5	79.2	1.9	18.0	18.0	0.71	
H042-h042	15 cm	24 h	1401	0.031	0.130	0.126	1.9	78.7	1.9	24.0	18.0	0.64	
H048-h048	15 cm	24 h	1400	0.031	0.129	0.125	1.6	79.0	2.0	18.0	24.0	0.79	
AHW-ahw	15 cm	24 h	339	-0.006	0.116	0.116	2.1	83.8	0.6				
ALW-alw	15 cm	24 h	365	0.058	0.132	0.118	0.8	78.4	3.0				
THW-thw	0.50 h	25 h	339	0.360	1.319	1.271	13.0	30.7	30.7				
TLW-tlw	0.50 h	25 h	365	-0.180	0.992	0.977	19.2	35.3	9.0				

Table A18: Water level skill assessment metrics at Matagorda City, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.181									
h			87453	0.183									
H-h	15 cm	24 h	87453	-0.002	0.148	0.148	3.0	74.4	0.5	54.7	6.5	0.72	0.78
AHW-ahw	15 cm	24 h	171	0.058	0.131	0.118	1.2	73.7	1.2	0.0	0.0		
ALW-alw	15 cm	24 h	215	-0.029	0.126	0.123	2.8	78.6	0.0	0.0	0.0		
THW-thw	0.50 h	25 h	171	0.458	1.537	1.471	17.5	17.0	36.3	0.0	0.0		
TLW-tlw	0.50 h	25 h	215	1.145	1.603	1.124	4.2	14.4	56.7	0.0	72.0		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	-0.000	0.148	0.148	3.3	74.2	0.6	48.0	6.0	0.78	
H006-h006	15 cm	24 h	1404	-0.001	0.152	0.152	3.4	74.3	0.8	66.0	6.0	1.14	
H012-h012	15 cm	24 h	1404	0.002	0.150	0.150	3.0	72.9	0.5	84.0	0.0	0.85	
H018-h018	15 cm	24 h	1404	0.003	0.147	0.147	3.4	73.9	0.8	84.0	6.0	1.00	
H024-h024	15 cm	24 h	1404	0.003	0.146	0.146	3.4	73.4	0.8	84.0	6.0	1.21	
H030-h030	15 cm	24 h	1403	0.001	0.147	0.147	3.4	73.8	0.7	78.0	6.0	1.14	
H036-h036	15 cm	24 h	1402	0.000	0.147	0.147	3.4	74.0	0.8	84.0	6.0	1.14	
H042-h042	15 cm	24 h	1401	0.000	0.144	0.144	2.9	74.5	0.6	84.0	6.0	0.64	
H048-h048	15 cm	24 h	1400	0.000	0.145	0.145	3.0	73.7	0.9	90.0	6.0	0.93	
AHW-ahw	15 cm	24 h	148	0.060	0.144	0.131	1.4	67.6	2.7				
ALW-alw	15 cm	24 h	194	-0.024	0.128	0.126	2.6	76.8	0.0				
THW-thw	0.50 h	25 h	148	0.772	1.589	1.394	12.2	19.6	49.3				
TLW-tlw	0.50 h	25 h	194	1.210	1.634	1.101	2.6	16.0	58.2				

Table A19: Water level skill assessment metrics at Sargent, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			87453	0.183									
h			87453	0.186									
H-h	15 cm	24 h	87453	-0.004	0.146	0.146	3.0	72.3	1.1	40.5	9.3	1.40	0.86
AHW-ahw	15 cm	24 h	273	0.074	0.133	0.111	0.7	73.6	1.8	0.0	0.0		
ALW-alw	15 cm	24 h	321	-0.106	0.171	0.133	6.9	65.1	0.0	26.5	0.0		
THW-thw	0.50 h	25 h	273	-0.858	1.488	1.218	48.0	22.7	6.6	81.9	0.0		
TLW-tlw	0.50 h	25 h	321	-0.930	1.432	1.091	48.3	19.6	5.9	71.9	0.0		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	-0.002	0.146	0.147	2.8	71.7	1.2	36.0	6.0	1.35	
H006-h006	15 cm	24 h	1404	-0.001	0.146	0.146	2.7	72.4	1.1	36.0	6.0	1.14	
H012-h012	15 cm	24 h	1404	-0.001	0.144	0.145	2.7	71.9	1.1	36.0	6.0	1.14	
H018-h018	15 cm	24 h	1404	-0.002	0.144	0.144	2.9	72.9	1.1	60.0	6.0	1.21	
H024-h024	15 cm	24 h	1404	-0.004	0.145	0.145	2.8	72.8	1.0	36.0	6.0	1.14	
H030-h030	15 cm	24 h	1403	-0.004	0.145	0.145	2.9	71.6	1.1	24.0	6.0	1.21	
H036-h036	15 cm	24 h	1402	-0.005	0.144	0.144	2.5	72.0	0.9	66.0	6.0	0.78	
H042-h042	15 cm	24 h	1401	-0.006	0.144	0.144	2.6	72.2	1.0	54.0	6.0	1.00	
H048-h048	15 cm	24 h	1400	-0.006	0.144	0.144	2.6	72.7	1.1	60.0	6.0	0.86	
AHW-ahw	15 cm	24 h	261	0.071	0.137	0.117	1.5	73.2	2.3				
ALW-alw	15 cm	24 h	314	-0.098	0.165	0.133	6.4	66.9	0.0				
THW-thw	0.50 h	25 h	261	-0.832	1.517	1.271	48.3	19.5	8.4				
TLW-tlw	0.50 h	25 h	314	-0.919	1.434	1.103	49.7	21.0	5.7				

Table A20: Water level skill assessment metrics at Freeport SPIP, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.183									
h			87453	0.232									
H-h	15 cm	24 h	87453	-0.049	0.127	0.117	2.4	80.4	0.1	44.7	3.5	0.05	0.92
AHW-ahw	15 cm	24 h	403	-0.103	0.150	0.110	4.0	71.0	0.0	48.7	0.0		
ALW-alw	15 cm	24 h	416	0.001	0.109	0.109	1.0	85.8	0.5	14.0	0.0		
THW-thw	0.50 h	25 h	403	0.460	1.117	1.019	7.2	30.5	29.0	0.0	49.1		
TLW-tlw	0.50 h	25 h	416	0.157	0.944	0.932	9.6	39.7	17.3	24.3	24.6		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	-0.046	0.127	0.119	2.1	79.3	0.1	36.0	0.0	0.00	
H006-h006	15 cm	24 h	1404	-0.044	0.127	0.119	2.4	79.9	0.1	42.0	0.0	0.14	
H012-h012	15 cm	24 h	1404	-0.044	0.127	0.120	2.5	79.6	0.1	66.0	0.0	0.00	
H018-h018	15 cm	24 h	1404	-0.044	0.127	0.119	2.5	79.8	0.1	48.0	0.0	0.07	
H024-h024	15 cm	24 h	1404	-0.046	0.129	0.120	2.6	79.4	0.0	66.0	0.0	0.07	
H030-h030	15 cm	24 h	1403	-0.047	0.128	0.119	2.8	79.6	0.2	48.0	0.0	0.21	
H036-h036	15 cm	24 h	1402	-0.047	0.128	0.119	2.7	79.0	0.2	78.0	0.0	0.29	
H042-h042	15 cm	24 h	1401	-0.049	0.129	0.119	2.5	79.2	0.2	48.0	0.0	0.21	
H048-h048	15 cm	24 h	1400	-0.049	0.131	0.121	2.7	78.9	0.0	48.0	0.0	0.07	
AHW-ahw	15 cm	24 h	394	-0.105	0.154	0.113	4.3	69.8	0.0				
ALW-alw	15 cm	24 h	407	0.005	0.110	0.110	1.2	85.7	0.5				
THW-thw	0.50 h	25 h	394	0.457	1.101	1.003	7.4	31.5	28.4				
TLW-tlw	0.50 h	25 h	407	0.114	0.928	0.922	10.1	43.7	15.0				

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Table A21: Water level skill assessment metrics at Manchester, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.163									
h			87453	0.117									
H-h	15 cm	24 h	87453	0.045	0.149	0.142	1.6	72.6	3.5	37.8	16.0	1.92	0.90
AHW-ahw	15 cm	24 h	329	-0.033	0.126	0.122	1.8	79.6	0.6	15.8	0.0		
ALW-alw	15 cm	24 h	408	0.139	0.185	0.123	0.5	55.6	10.8	0.0	71.0		
THW-thw	0.50 h	25 h	329	0.262	1.375	1.352	16.7	24.9	29.5	37.0	34.7		
TLW-tlw	0.50 h	25 h	408	-0.093	1.001	0.998	14.7	35.0	11.8	36.5	23.4		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	0.046	0.153	0.146	1.8	71.9	3.3	36.0	12.0	1.42	
H006-h006	15 cm	24 h	1404	0.047	0.154	0.146	1.9	71.0	3.3	36.0	12.0	1.50	
H012-h012	15 cm	24 h	1404	0.051	0.155	0.147	1.5	70.7	3.9	24.0	12.0	1.85	
H018-h018	15 cm	24 h	1404	0.051	0.157	0.149	1.9	69.5	4.3	66.0	12.0	2.07	
H024-h024	15 cm	24 h	1404	0.049	0.154	0.146	1.6	70.8	3.8	30.0	18.0	1.99	
H030-h030	15 cm	24 h	1403	0.047	0.154	0.147	1.6	70.9	4.1	36.0	18.0	2.21	
H036-h036	15 cm	24 h	1402	0.047	0.154	0.147	1.4	69.5	4.0	30.0	18.0	2.00	
H042-h042	15 cm	24 h	1401	0.047	0.156	0.149	1.6	69.9	4.1	30.0	18.0	2.00	
H048-h048	15 cm	24 h	1400	0.046	0.156	0.149	1.5	69.5	3.9	36.0	18.0	1.79	
AHW-ahw	15 cm	24 h	313	-0.034	0.136	0.132	2.6	78.9	0.6				
ALW-alw	15 cm	24 h	394	0.143	0.192	0.128	0.8	53.3	11.2				
THW-thw	0.50 h	25 h	313	0.370	1.361	1.312	15.3	25.6	32.6				
TLW-tlw	0.50 h	25 h	394	-0.042	0.964	0.964	16.2	37.3	15.0				

Table A22: Water level skill assessment metrics at Morgans Point, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.165									
h			87453	0.151									
H-h	15 cm	24 h	87453	0.014	0.131	0.130	1.8	79.2	1.5	42.4	10.5	0.67	0.92
AHW-ahw	15 cm	24 h	319	-0.067	0.136	0.118	2.8	76.2	0.3	15.6	0.0		
ALW-alw	15 cm	24 h	383	0.104	0.160	0.122	0.8	66.6	7.8	24.4	11.5		
THW-thw	0.50 h	25 h	319	0.756	1.383	1.160	4.7	25.7	41.1	15.4	48.1		
TLW-tlw	0.50 h	25 h	383	0.399	1.008	0.927	7.8	32.9	21.9	0.0	49.6		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	0.013	0.134	0.133	1.9	78.1	1.5	78.0	6.0	0.50	
H006-h006	15 cm	24 h	1404	0.016	0.135	0.134	1.9	77.2	1.6	60.0	6.0	0.57	
H012-h012	15 cm	24 h	1404	0.020	0.136	0.135	1.6	77.4	1.9	24.0	12.0	0.64	
H018-h018	15 cm	24 h	1404	0.020	0.137	0.135	1.8	77.7	2.1	66.0	12.0	0.64	
H024-h024	15 cm	24 h	1404	0.019	0.135	0.134	1.7	77.2	1.9	30.0	6.0	0.85	
H030-h030	15 cm	24 h	1403	0.017	0.135	0.134	1.6	77.4	2.0	30.0	12.0	1.07	
H036-h036	15 cm	24 h	1402	0.017	0.136	0.135	1.6	76.5	1.9	18.0	12.0	0.71	
H042-h042	15 cm	24 h	1401	0.017	0.137	0.136	1.6	76.7	2.4	30.0	12.0	1.14	
H048-h048	15 cm	24 h	1400	0.016	0.137	0.136	1.6	76.5	2.4	30.0	12.0	1.07	
AHW-ahw	15 cm	24 h	300	-0.066	0.138	0.122	2.7	76.0	0.3				
ALW-alw	15 cm	24 h	368	0.105	0.164	0.126	0.8	66.6	9.2				
THW-thw	0.50 h	25 h	300	0.695	1.300	1.101	5.7	33.3	38.3				
TLW-tlw	0.50 h	25 h	368	0.400	1.013	0.932	6.2	31.8	24.5				

Table A23: Water level skill assessment metrics at Galveston Railroad Bridge, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.235									
h			87453	0.220									
H-h	15 cm	24 h	87453	0.015	0.121	0.120	1.7	82.6	0.6	67.4	6.8	0.33	0.92
AHW-ahw	15 cm	24 h	398	-0.015	0.115	0.114	2.3	85.9	0.0	13.6	0.0		
ALW-alw	15 cm	24 h	436	0.057	0.136	0.124	1.6	77.1	2.5	11.5	13.4		
THW-thw	0.50 h	25 h	398	0.239	1.171	1.148	12.3	28.6	23.1	23.7	45.2		
TLW-tlw	0.50 h	25 h	436	0.554	1.138	0.995	6.4	27.5	31.4	0.0	73.5		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	0.014	0.121	0.120	1.7	82.8	0.5	66.0	0.0	0.28	
H006-h006	15 cm	24 h	1404	0.015	0.121	0.120	1.8	82.8	0.5	66.0	0.0	0.28	
H012-h012	15 cm	24 h	1404	0.018	0.122	0.121	1.9	82.1	0.7	66.0	0.0	0.36	
H018-h018	15 cm	24 h	1404	0.017	0.122	0.120	1.8	81.8	0.6	78.0	0.0	0.36	
H024-h024	15 cm	24 h	1404	0.015	0.121	0.120	1.8	81.1	0.6	54.0	0.0	0.28	
H030-h030	15 cm	24 h	1403	0.014	0.120	0.119	1.6	81.8	0.6	42.0	0.0	0.36	
H036-h036	15 cm	24 h	1402	0.015	0.122	0.121	1.5	80.5	0.8	42.0	6.0	0.43	
H042-h042	15 cm	24 h	1401	0.014	0.120	0.119	1.4	81.7	0.9	42.0	0.0	0.50	
H048-h048	15 cm	24 h	1400	0.012	0.121	0.121	1.5	81.6	0.8	42.0	6.0	0.57	
AHW-ahw	15 cm	24 h	373	-0.014	0.115	0.115	2.1	85.5	0.0				
ALW-alw	15 cm	24 h	414	0.058	0.138	0.125	1.9	76.6	3.6				
THW-thw	0.50 h	25 h	373	0.174	1.190	1.179	14.7	29.8	22.5				
TLW-tlw	0.50 h	25 h	414	0.547	1.108	0.964	6.0	32.6	30.7				

Table A24: Water level skill assessment metrics at Galveston Pier 21, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.230									
h			87453	0.225									
H-h	15 cm	24 h	87453	0.005	0.126	0.126	1.7	81.1	0.9	67.8	7.5	0.49	0.91
AHW-ahw	15 cm	24 h	371	-0.053	0.128	0.116	3.0	81.7	0.0	23.7	0.0		
ALW-alw	15 cm	24 h	429	0.081	0.149	0.125	0.9	71.8	4.2	14.0	48.7		
THW-thw	0.50 h	25 h	371	0.511	1.243	1.135	8.6	29.1	31.8	12.6	25.0		
TLW-tlw	0.50 h	25 h	429	0.484	1.090	0.978	6.8	31.2	29.6	0.0	36.2		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	0.005	0.127	0.127	1.8	81.2	1.0	66.0	6.0	0.50	
H006-h006	15 cm	24 h	1404	0.007	0.127	0.127	1.9	81.3	1.1	66.0	6.0	0.57	
H012-h012	15 cm	24 h	1404	0.009	0.128	0.128	1.8	80.8	1.2	66.0	6.0	0.71	
H018-h018	15 cm	24 h	1404	0.008	0.128	0.128	1.7	80.8	1.1	60.0	6.0	0.57	
H024-h024	15 cm	24 h	1404	0.007	0.127	0.127	1.9	81.0	1.1	60.0	0.0	0.50	
H030-h030	15 cm	24 h	1403	0.006	0.126	0.126	1.8	81.3	1.1	42.0	12.0	0.64	
H036-h036	15 cm	24 h	1402	0.007	0.129	0.129	1.8	80.3	1.2	66.0	12.0	0.71	
H042-h042	15 cm	24 h	1401	0.006	0.126	0.126	1.7	80.6	1.1	66.0	12.0	0.64	
H048-h048	15 cm	24 h	1400	0.004	0.128	0.128	1.8	81.0	1.2	24.0	12.0	0.64	
AHW-ahw	15 cm	24 h	372	-0.055	0.131	0.119	2.7	81.5	0.0				
ALW-alw	15 cm	24 h	422	0.080	0.149	0.126	0.9	72.3	5.2				
THW-thw	0.50 h	25 h	372	0.542	1.245	1.123	7.5	32.8	34.4				
TLW-tlw	0.50 h	25 h	422	0.513	1.107	0.982	5.2	30.6	29.9				

Table A25: Water level skill assessment metrics at Galveston Bay Entrance, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.246									
h			87453	0.201									
H-h	15 cm	24 h	87453	0.045	0.135	0.127	1.6	77.2	2.1	34.8	13.5	1.15	0.91
AHW-ahw	15 cm	24 h	430	-0.010	0.118	0.118	2.3	83.7	0.5	23.5	0.0		
ALW-alw	15 cm	24 h	460	0.107	0.167	0.128	1.3	62.8	6.5	15.2	47.9		
THW-thw	0.50 h	25 h	430	0.186	1.020	1.004	9.3	37.2	20.5	8.7	48.8		
TLW-tlw	0.50 h	25 h	460	0.119	0.974	0.968	10.2	35.0	15.2	23.6	51.2		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	0.043	0.135	0.128	1.7	76.4	1.9	66.0	18.0	0.93	
H006-h006	15 cm	24 h	1404	0.047	0.136	0.128	1.6	75.9	2.0	30.0	18.0	1.07	
H012-h012	15 cm	24 h	1404	0.048	0.138	0.129	1.7	75.9	2.4	66.0	18.0	1.42	
H018-h018	15 cm	24 h	1404	0.047	0.137	0.128	1.6	75.9	2.2	36.0	12.0	1.28	
H024-h024	15 cm	24 h	1404	0.045	0.137	0.129	1.6	76.4	2.3	30.0	12.0	1.07	
H030-h030	15 cm	24 h	1403	0.045	0.136	0.128	1.4	76.2	2.1	30.0	12.0	1.14	
H036-h036	15 cm	24 h	1402	0.046	0.138	0.130	1.5	76.5	2.4	30.0	12.0	1.14	
H042-h042	15 cm	24 h	1401	0.044	0.135	0.128	1.4	76.2	2.1	24.0	12.0	1.00	
H048-h048	15 cm	24 h	1400	0.044	0.137	0.130	1.6	75.9	2.3	30.0	12.0	1.14	
AHW-ahw	15 cm	24 h	416	-0.009	0.125	0.125	2.6	82.0	0.7				
ALW-alw	15 cm	24 h	443	0.109	0.171	0.133	1.1	62.3	8.4				
THW-thw	0.50 h	25 h	416	0.162	1.002	0.990	10.6	42.8	20.4				
TLW-tlw	0.50 h	25 h	443	0.056	0.974	0.973	11.3	40.0	14.4				

Table A26: Water level skill assessment metrics at Rollover Pass, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.307									
h			87453	0.294									
H-h	15 cm	24 h	87453	0.013	0.139	0.138	1.9	75.3	1.1	40.5	8.3	0.43	0.89
AHW-ahw	15 cm	24 h	367	-0.048	0.135	0.126	2.7	76.6	0.3	15.6	0.0		
ALW-alw	15 cm	24 h	420	0.092	0.159	0.130	1.0	67.4	4.3	12.2	0.0		
THW-thw	0.50 h	25 h	367	0.482	1.258	1.164	8.4	31.6	28.9	0.0	26.0		
TLW-tlw	0.50 h	25 h	420	0.344	1.077	1.022	7.6	33.1	20.7	0.0	24.9		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	0.013	0.138	0.138	1.9	75.1	1.1	36.0	12.0	0.28	
H006-h006	15 cm	24 h	1404	0.011	0.139	0.139	2.1	74.4	1.4	36.0	12.0	0.36	
H012-h012	15 cm	24 h	1404	0.013	0.140	0.140	1.9	74.7	1.3	36.0	6.0	0.28	
H018-h018	15 cm	24 h	1404	0.015	0.141	0.140	1.9	74.0	1.4	48.0	6.0	0.50	
H024-h024	15 cm	24 h	1404	0.013	0.141	0.140	2.1	73.9	1.2	36.0	6.0	0.43	
H030-h030	15 cm	24 h	1403	0.012	0.141	0.140	2.1	73.6	1.5	36.0	6.0	0.50	
H036-h036	15 cm	24 h	1402	0.011	0.147	0.147	1.7	73.2	1.6	36.0	6.0	0.71	
H042-h042	15 cm	24 h	1401	0.014	0.142	0.141	1.6	73.7	1.9	42.0	6.0	0.50	
H048-h048	15 cm	24 h	1400	0.012	0.141	0.141	2.1	73.5	1.6	42.0	6.0	0.43	
AHW-ahw	15 cm	24 h	347	-0.049	0.146	0.138	3.7	76.9	0.3				
ALW-alw	15 cm	24 h	400	0.092	0.161	0.133	1.2	65.8	6.2				
THW-thw	0.50 h	25 h	347	0.417	1.256	1.186	11.5	29.1	32.3				
TLW-tlw	0.50 h	25 h	400	0.382	1.048	0.978	7.8	34.0	24.2				

Table A27: Water level skill assessment metrics at High Island, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 60.01 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			72872	0.305									
h			72872	0.250									
H-h	15 cm	24 h	72872	0.055	0.139	0.127	1.0	73.5	2.3	23.9	13.0	1.00	0.89
AHW-ahw	15 cm	24 h	296	0.020	0.118	0.117	1.0	81.8	1.0	0.0	0.0		
ALW-alw	15 cm	24 h	322	0.132	0.185	0.129	0.6	54.7	8.7	12.2	15.4		
THW-thw	0.50 h	25 h	296	0.206	1.283	1.268	16.2	28.7	23.3	12.6	24.8		
TLW-tlw	0.50 h	25 h	322	-0.331	1.214	1.170	30.1	28.3	13.0	48.0	0.0		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1188	0.054	0.141	0.130	1.0	72.9	2.6	24.0	24.0	1.18	
H006-h006	15 cm	24 h	1188	0.052	0.141	0.131	1.1	73.5	2.5	24.0	24.0	1.18	
H012-h012	15 cm	24 h	1188	0.054	0.142	0.131	1.2	72.6	2.6	18.0	18.0	1.01	
H018-h018	15 cm	24 h	1188	0.057	0.143	0.131	1.2	72.1	2.7	24.0	18.0	1.09	
H024-h024	15 cm	24 h	1188	0.055	0.142	0.131	1.3	72.0	2.7	18.0	18.0	1.01	
H030-h030	15 cm	24 h	1186	0.054	0.142	0.131	1.1	72.9	2.8	18.0	18.0	1.18	
H036-h036	15 cm	24 h	1184	0.054	0.146	0.135	1.0	72.3	3.3	18.0	18.0	1.52	
H042-h042	15 cm	24 h	1182	0.056	0.146	0.135	0.9	72.0	3.0	18.0	18.0	1.27	
H048-h048	15 cm	24 h	1180	0.054	0.144	0.133	1.1	72.2	3.2	18.0	6.0	1.36	
AHW-ahw	15 cm	24 h	294	0.015	0.125	0.124	2.0	80.6	1.0				
ALW-alw	15 cm	24 h	317	0.132	0.185	0.130	0.6	55.8	9.8				
THW-thw	0.50 h	25 h	294	0.175	1.275	1.265	18.4	29.9	25.2				
TLW-tlw	0.50 h	25 h	317	-0.342	1.180	1.131	29.3	33.8	11.7				

Table A28: Water level skill assessment metrics at Rainbow Bridge, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.226									
h			87453	0.200									
H-h	15 cm	24 h	87453	0.026	0.119	0.116	0.9	79.4	0.4	19.2	8.7	0.21	0.91
AHW-ahw	15 cm	24 h	290	0.035	0.108	0.103	0.7	82.8	0.3	13.9	0.0		
ALW-alw	15 cm	24 h	376	0.032	0.114	0.110	0.5	80.6	0.3	0.0	0.0		
THW-thw	0.50 h	25 h	290	1.246	1.711	1.176	4.5	17.2	60.7	0.0	142.7		
TLW-tlw	0.50 h	25 h	376	1.329	1.617	0.922	2.4	8.8	67.0	0.0	147.4		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	0.025	0.120	0.117	1.1	78.6	0.4	12.0	6.0	0.36	
H006-h006	15 cm	24 h	1404	0.027	0.121	0.118	1.1	78.7	0.6	12.0	0.0	0.36	
H012-h012	15 cm	24 h	1404	0.030	0.121	0.117	0.9	78.7	0.6	12.0	0.0	0.14	
H018-h018	15 cm	24 h	1404	0.031	0.122	0.118	0.9	78.3	0.5	12.0	0.0	0.21	
H024-h024	15 cm	24 h	1404	0.029	0.120	0.116	0.9	79.1	0.5	12.0	6.0	0.21	
H030-h030	15 cm	24 h	1403	0.027	0.120	0.116	0.9	79.8	0.5	12.0	6.0	0.29	
H036-h036	15 cm	24 h	1402	0.027	0.121	0.118	0.9	78.8	0.8	12.0	6.0	0.43	
H042-h042	15 cm	24 h	1401	0.027	0.121	0.118	0.7	79.2	0.7	24.0	6.0	0.21	
H048-h048	15 cm	24 h	1400	0.026	0.121	0.118	0.9	79.6	0.9	12.0	12.0	0.36	
AHW-ahw	15 cm	24 h	276	0.034	0.105	0.100	0.4	85.1	0.4				
ALW-alw	15 cm	24 h	368	0.034	0.117	0.112	0.5	80.2	0.3				
THW-thw	0.50 h	25 h	276	1.335	1.704	1.061	2.9	15.9	65.6				
TLW-tlw	0.50 h	25 h	368	1.397	1.675	0.925	2.7	9.0	70.9				

Table A29: Water level skill assessment metrics at Port Arthur, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.237									
h			87453	0.190									
H-h	15 cm	24 h	87453	0.047	0.123	0.113	0.7	78.3	1.0	18.3	7.2	0.60	0.90
AHW-ahw	15 cm	24 h	323	0.037	0.114	0.108	0.6	80.5	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	385	0.067	0.129	0.110	0.3	75.3	1.8	0.0	0.0		
THW-thw	0.50 h	25 h	323	0.695	1.389	1.204	7.7	24.8	42.4	0.0	59.2		
TLW-tlw	0.50 h	25 h	385	0.089	0.898	0.895	11.4	38.2	13.2	12.8	24.0		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	0.046	0.124	0.116	0.7	77.9	1.1	18.0	6.0	0.64	
H006-h006	15 cm	24 h	1404	0.047	0.125	0.116	0.9	78.0	0.9	18.0	12.0	0.71	
H012-h012	15 cm	24 h	1404	0.049	0.125	0.116	0.9	77.5	1.3	24.0	12.0	0.85	
H018-h018	15 cm	24 h	1404	0.049	0.126	0.116	1.0	77.9	1.4	30.0	12.0	1.00	
H024-h024	15 cm	24 h	1404	0.047	0.126	0.116	0.9	78.1	1.1	24.0	12.0	0.71	
H030-h030	15 cm	24 h	1403	0.047	0.125	0.116	0.7	78.3	1.1	18.0	6.0	0.78	
H036-h036	15 cm	24 h	1402	0.049	0.125	0.116	0.4	78.4	1.5	18.0	12.0	0.78	
H042-h042	15 cm	24 h	1401	0.049	0.127	0.118	0.6	78.3	1.3	30.0	0.0	0.64	
H048-h048	15 cm	24 h	1400	0.049	0.127	0.117	0.4	78.6	1.4	18.0	6.0	0.71	
AHW-ahw	15 cm	24 h	303	0.033	0.116	0.112	0.7	78.9	0.7				
ALW-alw	15 cm	24 h	362	0.068	0.130	0.112	0.6	76.8	2.5				
THW-thw	0.50 h	25 h	303	0.686	1.370	1.187	9.2	23.8	41.9				
TLW-tlw	0.50 h	25 h	362	0.065	0.883	0.881	10.2	41.2	12.4				

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Table A30: Water level skill assessment metrics at Sabine Pass North, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			47789	0.270									
h			47789	0.297									
H-h	15 cm	24 h	47789	-0.027	0.106	0.103	2.9	90.4	0.0	64.6	0.2	0.00	0.92
AHW-ahw	15 cm	24 h	227	-0.073	0.116	0.091	2.6	87.2	0.0	23.7	0.0		
ALW-alw	15 cm	24 h	262	0.028	0.101	0.097	1.5	91.2	0.0	11.5	0.0		
THW-thw	0.50 h	25 h	227	-0.105	1.128	1.126	18.9	32.6	15.0	24.7	11.1		
TLW-tlw	0.50 h	25 h	262	-0.081	1.010	1.009	16.0	38.9	10.3	0.0	12.6		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	742	-0.033	0.112	0.107	3.0	88.8	0.0	72.0	0.0	0.00	
H006-h006	15 cm	24 h	741	-0.032	0.111	0.106	3.2	88.5	0.0	36.0	0.0	0.00	
H012-h012	15 cm	24 h	740	-0.030	0.110	0.106	3.4	88.9	0.0	36.0	0.0	0.00	
H018-h018	15 cm	24 h	739	-0.031	0.111	0.107	3.5	88.9	0.0	36.0	0.0	0.00	
H024-h024	15 cm	24 h	738	-0.032	0.112	0.108	3.7	89.3	0.0	36.0	0.0	0.14	
H030-h030	15 cm	24 h	737	-0.031	0.109	0.105	3.3	88.3	0.0	24.0	0.0	0.14	
H036-h036	15 cm	24 h	736	-0.029	0.108	0.104	2.9	88.7	0.1	36.0	0.0	0.14	
H042-h042	15 cm	24 h	735	-0.028	0.111	0.107	2.9	89.4	0.3	36.0	6.0	0.00	
H048-h048	15 cm	24 h	734	-0.029	0.110	0.106	3.1	88.4	0.1	36.0	0.0	0.00	
AHW-ahw	15 cm	24 h	206	-0.087	0.130	0.097	3.4	83.5	0.0				
ALW-alw	15 cm	24 h	244	0.021	0.100	0.098	1.6	91.8	0.0				
THW-thw	0.50 h	25 h	206	-0.104	1.070	1.067	18.9	32.5	14.6				
TLW-tlw	0.50 h	25 h	244	-0.048	0.990	0.991	16.8	43.9	13.9				

Table A31: Water level skill assessment metrics at Texas Point, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.214									
h			87453	0.180									
H-h	15 cm	24 h	87453	0.035	0.138	0.134	1.5	76.5	2.6	23.0	11.1	1.62	0.92
AHW-ahw	15 cm	24 h	524	-0.015	0.123	0.122	1.9	81.9	0.4	24.5	0.0		
ALW-alw	15 cm	24 h	544	0.109	0.175	0.137	0.4	62.9	8.6	0.0	48.9		
THW-thw	0.50 h	25 h	524	-0.049	1.054	1.053	17.6	33.6	13.7	35.3	24.5		
TLW-tlw	0.50 h	25 h	544	-0.054	0.933	0.933	12.9	39.0	10.7	25.5	14.0		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	0.032	0.139	0.135	1.9	76.6	2.6	30.0	12.0	1.78	
H006-h006	15 cm	24 h	1404	0.034	0.139	0.135	1.8	75.7	2.8	24.0	12.0	1.71	
H012-h012	15 cm	24 h	1404	0.036	0.140	0.135	1.6	76.1	2.7	24.0	12.0	1.71	
H018-h018	15 cm	24 h	1404	0.035	0.141	0.137	1.8	75.8	3.1	30.0	12.0	1.92	
H024-h024	15 cm	24 h	1404	0.034	0.141	0.137	1.7	76.2	3.1	24.0	12.0	1.85	
H030-h030	15 cm	24 h	1403	0.035	0.140	0.135	1.6	76.0	3.1	30.0	12.0	2.00	
H036-h036	15 cm	24 h	1402	0.036	0.142	0.137	1.5	75.6	2.9	30.0	6.0	1.93	
H042-h042	15 cm	24 h	1401	0.036	0.142	0.137	1.2	76.4	2.9	24.0	6.0	1.50	
H048-h048	15 cm	24 h	1400	0.035	0.142	0.138	1.6	75.4	3.0	24.0	18.0	2.00	
AHW-ahw	15 cm	24 h	498	-0.012	0.120	0.119	1.4	82.3	0.6				
ALW-alw	15 cm	24 h	520	0.108	0.175	0.138	0.6	60.8	9.6				
THW-thw	0.50 h	25 h	498	-0.106	1.035	1.031	17.3	39.6	12.2				
TLW-tlw	0.50 h	25 h	520	-0.104	0.926	0.921	15.8	41.5	8.1				

Table A32: Water level skill assessment metrics at Lake Charles, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.243									
h			87453	0.222									
H-h	15 cm	24 h	87453	0.021	0.131	0.129	1.4	76.5	1.5	20.5	6.5	1.05	0.90
AHW-ahw	15 cm	24 h	433	0.009	0.113	0.113	0.9	81.5	0.9	7.9	0.0		
ALW-alw	15 cm	24 h	487	0.037	0.140	0.135	1.6	72.1	2.5	0.0	12.3		
THW-thw	0.50 h	25 h	433	-0.410	1.361	1.299	35.6	20.8	16.2	24.3	73.6		
TLW-tlw	0.50 h	25 h	487	-0.916	1.268	0.877	45.0	19.9	2.7	73.4	24.8		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	0.021	0.132	0.131	1.4	75.3	1.9	12.0	6.0	1.28	
H006-h006	15 cm	24 h	1404	0.021	0.132	0.130	1.3	75.4	1.8	12.0	6.0	1.14	
H012-h012	15 cm	24 h	1404	0.023	0.136	0.134	1.4	74.9	2.0	12.0	6.0	1.35	
H018-h018	15 cm	24 h	1404	0.024	0.134	0.132	1.6	75.1	1.9	12.0	6.0	1.50	
H024-h024	15 cm	24 h	1404	0.023	0.135	0.133	1.8	75.4	1.8	24.0	6.0	1.28	
H030-h030	15 cm	24 h	1403	0.022	0.135	0.133	1.9	75.8	1.9	12.0	6.0	1.43	
H036-h036	15 cm	24 h	1402	0.023	0.136	0.134	2.0	75.3	2.1	24.0	12.0	1.50	
H042-h042	15 cm	24 h	1401	0.023	0.136	0.134	1.7	75.7	2.1	12.0	6.0	1.57	
H048-h048	15 cm	24 h	1400	0.024	0.139	0.137	1.9	75.7	2.2	12.0	12.0	1.50	
AHW-ahw	15 cm	24 h	418	0.006	0.119	0.119	1.0	79.9	1.0				
ALW-alw	15 cm	24 h	469	0.036	0.140	0.135	1.5	72.3	2.8				
THW-thw	0.50 h	25 h	418	-0.485	1.357	1.269	39.0	21.8	14.1				
TLW-tlw	0.50 h	25 h	469	-0.920	1.245	0.840	46.5	23.5	2.3				

Table A33: Water level skill assessment metrics at Bulk Terminal, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			87453	0.235									
h			87453	0.200									
H-h	15 cm	24 h	87453	0.035	0.126	0.121	0.8	77.8	1.5	20.2	6.9	0.74	0.90
AHW-ahw	15 cm	24 h	443	0.025	0.110	0.108	0.7	84.7	0.7	0.0	0.0		
ALW-alw	15 cm	24 h	489	0.048	0.134	0.125	0.6	72.2	2.2	0.0	12.3		
THW-thw	0.50 h	25 h	443	-0.251	1.274	1.250	28.0	21.7	16.0	61.8	70.3		
TLW-tlw	0.50 h	25 h	489	-0.732	1.088	0.805	31.3	27.2	2.5	37.9	0.0		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	0.035	0.127	0.123	0.8	77.1	1.4	18.0	6.0	0.64	
H006-h006	15 cm	24 h	1404	0.035	0.127	0.122	0.7	77.0	1.4	18.0	6.0	0.64	
H012-h012	15 cm	24 h	1404	0.037	0.131	0.125	0.6	77.2	1.9	12.0	6.0	0.85	
H018-h018	15 cm	24 h	1404	0.038	0.130	0.124	0.7	76.9	2.2	12.0	12.0	1.35	
H024-h024	15 cm	24 h	1404	0.037	0.130	0.125	0.7	77.0	1.6	18.0	6.0	1.00	
H030-h030	15 cm	24 h	1403	0.037	0.130	0.124	0.8	76.5	1.9	12.0	6.0	1.00	
H036-h036	15 cm	24 h	1402	0.037	0.131	0.126	1.0	76.6	2.2	18.0	12.0	1.43	
H042-h042	15 cm	24 h	1401	0.038	0.131	0.125	0.8	76.8	2.1	12.0	6.0	1.28	
H048-h048	15 cm	24 h	1400	0.038	0.135	0.129	0.9	76.6	2.4	12.0	12.0	1.36	
AHW-ahw	15 cm	24 h	421	0.023	0.115	0.113	0.2	82.4	1.0				
ALW-alw	15 cm	24 h	472	0.046	0.140	0.132	0.8	72.2	2.5				
THW-thw	0.50 h	25 h	421	-0.269	1.232	1.203	29.2	26.4	16.6				
TLW-tlw	0.50 h	25 h	472	-0.728	1.084	0.804	33.5	29.2	2.3				

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Table A34: Water level skill assessment metrics at Calcasieu Pass, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			87453	0.212									
h			87453	0.184									
H-h	15 cm	24 h	87453	0.027	0.152	0.149	1.8	72.2	3.9	21.4	9.5	2.37	0.89
AHW-ahw	15 cm	24 h	399	-0.040	0.138	0.132	2.5	73.9	0.3	50.0	0.0		
ALW-alw	15 cm	24 h	475	0.127	0.193	0.146	0.4	58.9	13.5	0.0	73.9		
THW-thw	0.50 h	25 h	399	0.198	1.125	1.109	11.5	33.3	20.8	16.5	27.4		
TLW-tlw	0.50 h	25 h	475	0.282	0.950	0.908	7.6	41.1	18.7	10.5	25.7		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	0.026	0.153	0.151	1.8	70.9	3.8	42.0	12.0	2.35	
H006-h006	15 cm	24 h	1404	0.027	0.154	0.152	1.8	70.7	4.3	54.0	30.0	2.56	
H012-h012	15 cm	24 h	1404	0.028	0.154	0.152	1.5	70.7	4.3	24.0	12.0	2.21	
H018-h018	15 cm	24 h	1404	0.028	0.158	0.155	1.6	70.7	4.3	24.0	30.0	2.78	
H024-h024	15 cm	24 h	1404	0.026	0.157	0.155	1.7	70.9	4.2	24.0	12.0	2.56	
H030-h030	15 cm	24 h	1403	0.027	0.155	0.153	1.5	71.3	4.3	24.0	18.0	2.78	
H036-h036	15 cm	24 h	1402	0.028	0.158	0.156	1.5	70.3	4.9	24.0	12.0	2.85	
H042-h042	15 cm	24 h	1401	0.029	0.159	0.157	1.4	70.7	4.1	24.0	30.0	2.43	
H048-h048	15 cm	24 h	1400	0.028	0.158	0.155	1.5	71.1	4.1	24.0	18.0	2.36	
AHW-ahw	15 cm	24 h	380	-0.044	0.146	0.139	3.2	75.0	0.3				
ALW-alw	15 cm	24 h	455	0.128	0.197	0.150	0.9	59.1	14.3				
THW-thw	0.50 h	25 h	380	0.158	1.107	1.097	12.9	34.5	20.5				
TLW-tlw	0.50 h	25 h	455	0.316	0.938	0.884	7.5	39.8	19.8				

Table A35: Water level skill assessment metrics at Freshwater Canal, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 37.32 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			78500	0.213									
h			78500	0.163									
H-h	15 cm	24 h	78500	0.050	0.145	0.136	0.7	74.1	4.0	8.0	14.1	3.03	0.92
AHW-ahw	15 cm	24 h	382	-0.066	0.153	0.138	4.2	73.6	0.5	0.0	0.0		
ALW-alw	15 cm	24 h	400	0.172	0.225	0.145	0.0	49.0	18.0	0.0	74.0		
THW-thw	0.50 h	25 h	382	0.218	1.099	1.078	12.3	33.0	23.6	9.0	49.3		
TLW-tlw	0.50 h	25 h	400	-0.094	1.012	1.009	16.2	31.5	12.8	24.4	24.2		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1255	0.053	0.145	0.135	0.6	73.9	4.4	0.0	24.0	3.03	
H006-h006	15 cm	24 h	1255	0.054	0.145	0.134	0.6	74.0	4.5	0.0	24.0	2.95	
H012-h012	15 cm	24 h	1255	0.057	0.149	0.138	0.5	74.1	4.6	0.0	24.0	3.35	
H018-h018	15 cm	24 h	1255	0.057	0.153	0.142	0.7	74.3	4.7	0.0	30.0	3.35	
H024-h024	15 cm	24 h	1255	0.056	0.155	0.144	0.4	73.1	4.9	0.0	24.0	3.43	
H030-h030	15 cm	24 h	1254	0.056	0.160	0.150	0.5	73.0	5.9	0.0	24.0	3.99	
H036-h036	15 cm	24 h	1253	0.057	0.159	0.148	0.3	72.1	5.1	0.0	24.0	3.83	
H042-h042	15 cm	24 h	1252	0.058	0.161	0.151	0.4	72.6	5.0	0.0	18.0	3.35	
H048-h048	15 cm	24 h	1251	0.057	0.158	0.148	0.5	72.8	5.1	0.0	18.0	3.68	
AHW-ahw	15 cm	24 h	357	-0.064	0.151	0.137	3.9	74.5	1.1				
ALW-alw	15 cm	24 h	380	0.171	0.225	0.147	0.0	51.3	17.9				
THW-thw	0.50 h	25 h	357	0.231	1.113	1.090	12.6	32.2	23.2				
TLW-tlw	0.50 h	25 h	380	-0.061	0.935	0.935	13.9	34.7	12.4				

Table A36: Water level skill assessment metrics at Atchafalaya Delta, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.21 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87404	0.291									
h			87404	0.228									
H-h	15 cm	24 h	87404	0.064	0.142	0.127	0.4	69.3	2.3	11.0	8.7	0.58	0.89
AHW-ahw	15 cm	24 h	435	0.026	0.127	0.124	0.5	77.9	0.7	0.0	0.0		
ALW-alw	15 cm	24 h	478	0.075	0.147	0.127	0.4	62.3	1.3	0.0	0.0		
THW-thw	0.50 h	25 h	435	0.251	1.162	1.136	12.9	32.0	23.4	26.4	47.9		
TLW-tlw	0.50 h	25 h	478	-0.066	1.134	1.133	18.4	32.6	13.8	21.4	49.1		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1403	0.067	0.146	0.129	0.4	68.5	2.6	6.0	6.0	0.50	
H006-h006	15 cm	24 h	1403	0.067	0.147	0.131	0.6	67.5	2.9	6.0	12.0	0.36	
H012-h012	15 cm	24 h	1403	0.071	0.150	0.132	0.8	67.4	3.4	6.0	24.0	0.86	
H018-h018	15 cm	24 h	1403	0.072	0.151	0.133	0.9	67.6	3.2	6.0	24.0	0.86	
H024-h024	15 cm	24 h	1403	0.070	0.154	0.137	0.9	67.8	3.3	12.0	12.0	0.86	
H030-h030	15 cm	24 h	1402	0.069	0.152	0.136	1.0	66.5	3.6	12.0	12.0	1.00	
H036-h036	15 cm	24 h	1401	0.070	0.154	0.137	1.0	66.4	3.9	6.0	12.0	1.14	
H042-h042	15 cm	24 h	1400	0.070	0.155	0.138	1.0	66.1	3.3	18.0	12.0	0.86	
H048-h048	15 cm	24 h	1399	0.071	0.156	0.139	0.8	67.0	3.7	18.0	12.0	0.71	
AHW-ahw	15 cm	24 h	388	0.032	0.130	0.126	0.8	77.1	1.5				
ALW-alw	15 cm	24 h	450	0.077	0.150	0.129	0.4	62.2	1.8				
THW-thw	0.50 h	25 h	388	0.321	1.171	1.128	11.1	32.2	26.5				
TLW-tlw	0.50 h	25 h	450	0.036	1.131	1.132	17.3	36.4	17.3				

Table A37: Water level skill assessment metrics at Eugene Island, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.272									
h			87453	0.221									
H-h	15 cm	24 h	87453	0.051	0.140	0.130	1.0	72.6	2.4	16.0	6.9	1.26	0.90
AHW-ahw	15 cm	24 h	441	-0.019	0.124	0.122	2.0	77.1	0.0	8.3	0.0		
ALW-alw	15 cm	24 h	477	0.123	0.168	0.115	0.2	61.0	6.3	0.0	21.9		
THW-thw	0.50 h	25 h	441	0.339	1.180	1.131	12.2	32.7	27.0	22.6	69.9		
TLW-tlw	0.50 h	25 h	477	0.018	1.071	1.072	14.7	39.8	14.9	48.5	24.9		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	0.053	0.143	0.132	1.0	71.9	2.5	12.0	6.0	1.42	
H006-h006	15 cm	24 h	1404	0.053	0.144	0.134	1.3	70.9	2.8	12.0	12.0	1.42	
H012-h012	15 cm	24 h	1404	0.057	0.149	0.138	1.1	70.2	2.8	18.0	6.0	1.50	
H018-h018	15 cm	24 h	1404	0.058	0.149	0.138	1.1	70.7	3.3	12.0	6.0	1.64	
H024-h024	15 cm	24 h	1404	0.056	0.150	0.139	1.2	70.9	3.5	12.0	6.0	1.50	
H030-h030	15 cm	24 h	1403	0.055	0.151	0.140	1.0	70.2	3.6	30.0	12.0	1.64	
H036-h036	15 cm	24 h	1402	0.056	0.154	0.143	1.3	69.5	4.4	18.0	12.0	1.93	
H042-h042	15 cm	24 h	1401	0.055	0.155	0.145	1.2	69.0	4.5	18.0	12.0	2.07	
H048-h048	15 cm	24 h	1400	0.057	0.154	0.143	1.4	70.1	4.5	24.0	12.0	2.21	
AHW-ahw	15 cm	24 h	394	-0.022	0.125	0.123	2.5	76.4	0.0				
ALW-alw	15 cm	24 h	445	0.124	0.171	0.118	0.2	58.4	7.0				
THW-thw	0.50 h	25 h	394	0.358	1.175	1.121	10.7	33.0	26.9				
TLW-tlw	0.50 h	25 h	445	0.078	1.098	1.097	14.6	37.1	18.0				

Table A38: Water level skill assessment metrics at Grand Isle, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.122									
h			87453	0.077									
H-h	15 cm	24 h	87453	0.045	0.114	0.105	0.6	81.0	0.3	32.6	6.9	0.28	0.90
AHW-ahw	15 cm	24 h	335	0.050	0.120	0.109	0.6	80.9	0.9	0.0	0.0		
ALW-alw	15 cm	24 h	344	0.047	0.113	0.103	0.3	81.1	0.0	0.0	0.0		
THW-thw	0.50 h	25 h	335	-0.027	1.076	1.078	15.8	31.0	15.2	0.0	24.5		
TLW-tlw	0.50 h	25 h	344	0.023	1.037	1.038	14.0	38.1	15.4	48.8	0.0		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	0.044	0.115	0.106	0.6	80.6	0.4	30.0	12.0	0.43	
H006-h006	15 cm	24 h	1404	0.044	0.113	0.104	0.6	80.5	0.4	18.0	6.0	0.36	
H012-h012	15 cm	24 h	1404	0.045	0.114	0.105	0.5	80.8	0.4	18.0	0.0	0.57	
H018-h018	15 cm	24 h	1404	0.045	0.115	0.105	0.6	81.5	0.4	24.0	0.0	0.71	
H024-h024	15 cm	24 h	1404	0.045	0.114	0.105	0.7	81.6	0.4	30.0	0.0	0.50	
H030-h030	15 cm	24 h	1403	0.045	0.115	0.106	0.9	81.4	0.3	30.0	6.0	0.50	
H036-h036	15 cm	24 h	1402	0.045	0.116	0.107	0.9	81.0	0.4	30.0	6.0	0.64	
H042-h042	15 cm	24 h	1401	0.044	0.115	0.106	0.7	81.7	0.4	12.0	18.0	0.50	
H048-h048	15 cm	24 h	1400	0.044	0.115	0.107	0.7	81.5	0.7	24.0	12.0	0.86	
AHW-ahw	15 cm	24 h	326	0.048	0.120	0.110	0.6	81.0	1.2				
ALW-alw	15 cm	24 h	331	0.051	0.118	0.106	0.6	79.2	0.3				
THW-thw	0.50 h	25 h	326	-0.023	1.111	1.113	18.4	34.4	15.3				
TLW-tlw	0.50 h	25 h	331	0.069	1.090	1.090	13.6	38.4	19.6				

Table A39: Water level skill assessment metrics at Pilots Station, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.260									
h			87453	0.300									
H-h	15 cm	24 h	87453	-0.040	0.108	0.101	1.6	86.3	0.0	58.7	0.0	0.00	0.90
AHW-ahw	15 cm	24 h	315	-0.071	0.125	0.104	2.2	80.3	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	317	0.006	0.090	0.090	0.6	89.9	0.0	0.0	0.0		
THW-thw	0.50 h	25 h	315	0.458	1.169	1.078	8.3	28.9	30.5	0.0	24.9		
TLW-tlw	0.50 h	25 h	317	0.325	1.106	1.059	9.5	29.7	26.5	0.0	49.0		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	-0.042	0.110	0.101	1.6	86.2	0.0	54.0	0.0	0.00	
H006-h006	15 cm	24 h	1404	-0.042	0.110	0.101	1.6	86.3	0.0	54.0	0.0	0.00	
H012-h012	15 cm	24 h	1404	-0.042	0.110	0.101	1.7	85.5	0.0	54.0	0.0	0.00	
H018-h018	15 cm	24 h	1404	-0.042	0.109	0.101	1.7	86.4	0.0	54.0	0.0	0.00	
H024-h024	15 cm	24 h	1404	-0.043	0.109	0.100	1.7	86.3	0.0	54.0	0.0	0.00	
H030-h030	15 cm	24 h	1403	-0.044	0.110	0.101	1.7	85.4	0.0	54.0	0.0	0.00	
H036-h036	15 cm	24 h	1402	-0.044	0.111	0.101	1.6	85.7	0.0	54.0	0.0	0.00	
H042-h042	15 cm	24 h	1401	-0.045	0.111	0.101	1.7	85.6	0.0	54.0	0.0	0.00	
H048-h048	15 cm	24 h	1400	-0.045	0.111	0.102	1.8	85.5	0.0	54.0	0.0	0.00	
AHW-ahw	15 cm	24 h	298	-0.076	0.128	0.104	2.7	80.9	0.0				
ALW-alw	15 cm	24 h	301	0.006	0.091	0.091	0.7	91.4	0.0				
THW-thw	0.50 h	25 h	298	0.457	1.161	1.069	7.7	31.2	29.5				
TLW-tlw	0.50 h	25 h	301	0.299	1.137	1.099	10.0	31.6	25.2				

Table A40: Water level skill assessment metrics at Shell Beach, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.80 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87265	0.257									
h			87265	0.202									
H-h	15 cm	24 h	87265	0.055	0.141	0.130	1.1	71.9	1.8	34.3	16.9	0.87	0.90
AHW-ahw	15 cm	24 h	369	-0.002	0.117	0.117	1.4	82.4	0.3	46.2	0.0		
ALW-alw	15 cm	24 h	392	0.129	0.190	0.139	1.0	50.8	7.4	0.0	49.5		
THW-thw	0.50 h	25 h	369	0.451	1.245	1.161	10.8	22.2	34.1	25.5	72.7		
TLW-tlw	0.50 h	25 h	392	0.224	1.102	1.080	10.5	28.8	20.9	23.1	23.4		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1401	0.054	0.142	0.131	1.2	71.1	1.8	30.0	12.0	1.00	
H006-h006	15 cm	24 h	1401	0.053	0.141	0.131	1.1	71.2	1.7	30.0	12.0	0.86	
H012-h012	15 cm	24 h	1401	0.053	0.141	0.131	1.1	71.7	1.6	30.0	6.0	0.79	
H018-h018	15 cm	24 h	1401	0.053	0.145	0.135	1.2	70.1	2.1	48.0	12.0	0.93	
H024-h024	15 cm	24 h	1401	0.054	0.145	0.135	1.0	70.6	2.1	30.0	12.0	0.79	
H030-h030	15 cm	24 h	1400	0.053	0.147	0.138	1.4	71.4	2.4	36.0	6.0	0.86	
H036-h036	15 cm	24 h	1399	0.052	0.149	0.140	1.2	70.8	2.7	36.0	6.0	1.14	
H042-h042	15 cm	24 h	1398	0.051	0.152	0.143	1.5	69.1	3.0	36.0	6.0	1.14	
H048-h048	15 cm	24 h	1397	0.051	0.153	0.144	1.8	69.4	3.4	30.0	30.0	0.86	
AHW-ahw	15 cm	24 h	349	-0.000	0.116	0.116	1.1	81.7	0.3				
ALW-alw	15 cm	24 h	373	0.129	0.184	0.132	1.1	50.1	8.6				
THW-thw	0.50 h	25 h	349	0.489	1.230	1.130	9.5	22.9	35.0				
TLW-tlw	0.50 h	25 h	373	0.218	1.112	1.092	11.8	32.7	22.0				

Table A41: Water level skill assessment metrics at Bonnet Carre Floodway, LA
Observed data time period: 3/15/2020 to 6/30/2020 with gaps of 13.13 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			22714	0.263									
h			22714	0.206									
H-h	15 cm	24 h	22714	0.057	0.094	0.075	0.1	92.0	0.0	1.0	0.8	0.04	0.91
AHW-ahw	15 cm	24 h	72	0.041	0.095	0.087	1.4	93.1	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	74	0.073	0.099	0.067	0.0	89.2	0.0	0.0	0.0		
THW-thw	0.50 h	25 h	72	0.350	1.337	1.300	15.3	19.4	34.7	0.0	0.0		
TLW-tlw	0.50 h	25 h	74	0.377	1.318	1.272	14.9	21.6	33.8	0.0	0.0		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	336	0.054	0.095	0.078	0.0	91.1	0.0	0.0	0.0	0.00	
H006-h006	15 cm	24 h	335	0.055	0.094	0.076	0.0	91.0	0.0	0.0	0.0	0.00	
H012-h012	15 cm	24 h	334	0.056	0.094	0.076	0.0	90.7	0.0	0.0	0.0	0.00	
H018-h018	15 cm	24 h	333	0.055	0.095	0.078	0.0	91.3	0.0	0.0	0.0	0.00	
H024-h024	15 cm	24 h	332	0.056	0.096	0.078	0.0	91.9	0.3	0.0	0.0	0.00	
H030-h030	15 cm	24 h	331	0.057	0.096	0.078	0.0	90.9	0.3	0.0	0.0	0.00	
H036-h036	15 cm	24 h	330	0.055	0.101	0.085	0.0	90.9	0.6	0.0	12.0	0.00	
H042-h042	15 cm	24 h	329	0.054	0.098	0.081	0.0	87.5	0.3	0.0	0.0	0.00	
H048-h048	15 cm	24 h	328	0.054	0.106	0.091	0.0	88.4	0.6	0.0	6.0	0.00	
AHW-ahw	15 cm	24 h	58	0.055	0.094	0.076	0.0	93.1	0.0				
ALW-alw	15 cm	24 h	61	0.081	0.106	0.068	0.0	86.9	0.0				
THW-thw	0.50 h	25 h	58	0.574	1.344	1.226	15.5	24.1	37.9				
TLW-tlw	0.50 h	25 h	61	0.448	1.407	1.345	24.6	21.3	41.0				

Table A42: Water level skill assessment metrics at New Canal Station, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.253									
h			87453	0.193									
H-h	15 cm	24 h	87453	0.059	0.123	0.107	0.2	76.3	0.6	10.1	28.8	0.63	0.91
AHW-ahw	15 cm	24 h	281	0.043	0.122	0.114	0.4	77.9	0.4	0.0	0.0		
ALW-alw	15 cm	24 h	279	0.075	0.127	0.103	0.0	74.6	0.4	0.0	0.0		
THW-thw	0.50 h	25 h	281	0.203	1.335	1.322	17.4	22.8	27.4	0.0	73.4		
TLW-tlw	0.50 h	25 h	279	0.007	1.312	1.314	23.3	25.1	22.6	0.0	48.3		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	0.059	0.124	0.109	0.1	75.6	0.7	6.0	24.0	0.71	
H006-h006	15 cm	24 h	1404	0.059	0.123	0.108	0.1	76.3	0.7	6.0	24.0	0.71	
H012-h012	15 cm	24 h	1404	0.059	0.123	0.108	0.1	76.0	0.8	0.0	24.0	0.71	
H018-h018	15 cm	24 h	1404	0.060	0.122	0.107	0.1	76.9	0.8	0.0	18.0	0.64	
H024-h024	15 cm	24 h	1404	0.060	0.122	0.106	0.2	76.8	0.6	6.0	12.0	0.43	
H030-h030	15 cm	24 h	1403	0.060	0.123	0.107	0.3	77.0	0.7	12.0	12.0	0.50	
H036-h036	15 cm	24 h	1402	0.061	0.124	0.108	0.4	76.7	0.6	12.0	6.0	0.57	
H042-h042	15 cm	24 h	1401	0.061	0.126	0.110	0.4	75.4	0.8	12.0	6.0	0.64	
H048-h048	15 cm	24 h	1400	0.061	0.127	0.112	0.4	76.1	1.2	12.0	12.0	0.79	
AHW-ahw	15 cm	24 h	260	0.052	0.118	0.106	0.0	78.1	0.4				
ALW-alw	15 cm	24 h	259	0.079	0.131	0.104	0.4	71.4	0.4				
THW-thw	0.50 h	25 h	260	0.126	1.243	1.239	16.9	31.2	24.2				
TLW-tlw	0.50 h	25 h	259	0.037	1.317	1.319	22.8	28.2	23.6				

Table A43: Water level skill assessment metrics at Bay Waveland, MS
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.33 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87377	0.192									
h			87377	0.147									
H-h	15 cm	24 h	87377	0.045	0.128	0.120	0.9	77.4	1.4	21.0	22.2	1.08	0.93
AHW-ahw	15 cm	24 h	396	0.018	0.112	0.110	0.8	87.4	0.8	0.0	0.0		
ALW-alw	15 cm	24 h	399	0.084	0.144	0.117	0.5	69.7	3.0	0.0	0.0		
THW-thw	0.50 h	25 h	396	0.433	1.212	1.133	10.4	29.3	27.8	22.2	48.7		
TLW-tlw	0.50 h	25 h	399	0.204	1.016	0.997	10.5	39.3	17.3	12.0	22.7		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1403	0.048	0.131	0.122	0.9	76.1	1.4	36.0	18.0	1.14	
H006-h006	15 cm	24 h	1403	0.048	0.131	0.122	0.8	75.4	1.6	36.0	18.0	1.21	
H012-h012	15 cm	24 h	1403	0.051	0.134	0.124	0.6	73.8	2.1	12.0	18.0	1.50	
H018-h018	15 cm	24 h	1403	0.051	0.136	0.126	0.4	73.1	2.2	6.0	6.0	1.57	
H024-h024	15 cm	24 h	1403	0.050	0.134	0.125	0.2	73.6	2.4	0.0	12.0	1.35	
H030-h030	15 cm	24 h	1402	0.052	0.138	0.128	0.5	74.2	2.8	0.0	24.0	1.78	
H036-h036	15 cm	24 h	1401	0.051	0.142	0.132	0.6	72.9	3.3	6.0	30.0	1.64	
H042-h042	15 cm	24 h	1400	0.051	0.142	0.132	0.7	73.2	3.2	6.0	12.0	1.79	
H048-h048	15 cm	24 h	1399	0.049	0.144	0.135	0.7	73.0	2.9	6.0	18.0	1.57	
AHW-ahw	15 cm	24 h	382	0.019	0.109	0.107	0.3	85.6	0.8				
ALW-alw	15 cm	24 h	380	0.088	0.144	0.114	0.3	68.9	2.6				
THW-thw	0.50 h	25 h	382	0.498	1.264	1.163	10.2	28.0	32.2				
TLW-tlw	0.50 h	25 h	380	0.199	1.018	0.999	12.1	38.7	19.7				

Table A44: Water level skill assessment metrics at Pascagoula NOAA Lab, MS
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			87453	0.167									
h			87453	0.173									
H-h	15 cm	24 h	87453	-0.006	0.103	0.103	0.9	87.7	0.1	35.3	2.0	0.09	0.94
AHW-ahw	15 cm	24 h	378	-0.011	0.109	0.109	1.3	89.7	0.5	0.0	0.0		
ALW-alw	15 cm	24 h	363	0.015	0.103	0.102	0.6	85.7	0.0	0.0	0.0		
THW-thw	0.50 h	25 h	378	-0.046	1.173	1.174	18.8	32.8	16.1	72.9	23.6		
TLW-tlw	0.50 h	25 h	363	-0.448	1.205	1.120	28.7	30.9	8.8	49.7	23.2		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	-0.006	0.104	0.104	1.2	87.5	0.1	30.0	0.0	0.07	
H006-h006	15 cm	24 h	1404	-0.005	0.102	0.102	0.9	87.4	0.1	12.0	0.0	0.07	
H012-h012	15 cm	24 h	1404	-0.004	0.107	0.107	0.8	86.0	0.2	12.0	0.0	0.28	
H018-h018	15 cm	24 h	1404	-0.004	0.105	0.105	0.4	85.7	0.1	0.0	0.0	0.14	
H024-h024	15 cm	24 h	1404	-0.005	0.107	0.107	0.5	85.3	0.2	6.0	0.0	0.14	
H030-h030	15 cm	24 h	1403	-0.005	0.110	0.110	0.8	84.8	0.4	12.0	0.0	0.21	
H036-h036	15 cm	24 h	1402	-0.005	0.114	0.114	1.1	82.8	0.4	24.0	6.0	0.29	
H042-h042	15 cm	24 h	1401	-0.006	0.114	0.114	1.1	82.7	0.3	30.0	0.0	0.07	
H048-h048	15 cm	24 h	1400	-0.008	0.116	0.116	1.0	83.6	0.7	30.0	6.0	0.36	
AHW-ahw	15 cm	24 h	360	-0.012	0.110	0.109	0.8	86.9	0.3				
ALW-alw	15 cm	24 h	343	0.015	0.102	0.101	0.3	86.6	0.3				
THW-thw	0.50 h	25 h	360	0.042	1.169	1.169	16.7	28.9	19.4				
TLW-tlw	0.50 h	25 h	343	-0.494	1.230	1.128	32.1	30.0	9.3				

Table A45: Water level skill assessment metrics at Mobile State Docks, AL
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.30 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87382	0.196									
h			87382	0.172									
H-h	15 cm	24 h	87382	0.024	0.113	0.111	0.7	82.7	0.6	26.6	10.0	0.66	0.94
AHW-ahw	15 cm	24 h	389	0.041	0.103	0.095	0.8	86.1	0.3	0.0	0.0		
ALW-alw	15 cm	24 h	382	0.021	0.117	0.116	0.8	79.6	0.5	7.8	0.0		
THW-thw	0.50 h	25 h	389	-0.160	1.155	1.146	21.9	29.8	15.4	46.8	62.4		
TLW-tlw	0.50 h	25 h	382	-0.615	1.169	0.996	34.6	30.6	3.4	122.4	11.0		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1402	0.029	0.113	0.109	0.7	81.9	0.5	36.0	6.0	0.64	
H006-h006	15 cm	24 h	1402	0.030	0.116	0.112	0.6	82.2	0.4	18.0	6.0	0.50	
H012-h012	15 cm	24 h	1402	0.031	0.118	0.114	0.7	82.0	0.6	6.0	6.0	0.71	
H018-h018	15 cm	24 h	1402	0.032	0.118	0.113	0.5	81.4	0.9	12.0	12.0	0.93	
H024-h024	15 cm	24 h	1402	0.032	0.120	0.116	0.4	81.7	1.1	12.0	12.0	0.86	
H030-h030	15 cm	24 h	1401	0.032	0.123	0.118	0.6	81.4	1.4	12.0	18.0	1.21	
H036-h036	15 cm	24 h	1400	0.032	0.126	0.122	0.8	80.6	1.6	12.0	24.0	1.36	
H042-h042	15 cm	24 h	1399	0.031	0.124	0.120	0.6	80.6	1.6	24.0	12.0	1.14	
H048-h048	15 cm	24 h	1398	0.032	0.128	0.124	0.7	79.3	1.5	24.0	12.0	1.00	
AHW-ahw	15 cm	24 h	370	0.038	0.102	0.095	0.3	87.3	0.8				
ALW-alw	15 cm	24 h	370	0.028	0.116	0.113	0.5	78.9	0.5				
THW-thw	0.50 h	25 h	370	-0.102	1.116	1.113	20.3	31.9	14.9				
TLW-tlw	0.50 h	25 h	370	-0.562	1.186	1.046	33.2	30.5	7.0				

Table A46: Water level skill assessment metrics at USCG Sector Mobile, AL
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.29 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87386	0.186									
h			87386	0.175									
H-h	15 cm	24 h	87386	0.012	0.114	0.114	0.8	83.1	0.6	29.6	10.8	0.32	0.94
AHW-ahw	15 cm	24 h	376	0.006	0.101	0.101	0.8	87.5	0.3	0.0	0.0		
ALW-alw	15 cm	24 h	377	0.024	0.111	0.108	0.3	83.0	0.5	0.0	0.0		
THW-thw	0.50 h	25 h	376	0.137	1.024	1.016	13.6	35.4	16.8	23.8	48.9		
TLW-tlw	0.50 h	25 h	377	-0.315	1.021	0.973	21.5	36.1	8.2	24.2	21.8		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1402	0.015	0.114	0.113	0.7	83.0	0.6	36.0	12.0	0.36	
H006-h006	15 cm	24 h	1402	0.016	0.116	0.115	0.7	83.0	0.6	18.0	6.0	0.43	
H012-h012	15 cm	24 h	1402	0.016	0.119	0.118	0.8	81.7	0.8	12.0	12.0	0.57	
H018-h018	15 cm	24 h	1402	0.018	0.120	0.119	0.7	81.2	1.0	12.0	6.0	0.78	
H024-h024	15 cm	24 h	1402	0.017	0.121	0.120	0.5	81.3	1.3	12.0	18.0	0.86	
H030-h030	15 cm	24 h	1401	0.017	0.124	0.123	0.6	80.4	1.6	12.0	18.0	1.21	
H036-h036	15 cm	24 h	1400	0.017	0.128	0.127	0.9	79.5	1.7	12.0	12.0	1.14	
H042-h042	15 cm	24 h	1399	0.016	0.127	0.126	0.9	79.6	1.3	18.0	24.0	0.71	
H048-h048	15 cm	24 h	1398	0.016	0.131	0.130	0.8	78.0	1.4	24.0	24.0	0.79	
AHW-ahw	15 cm	24 h	358	0.007	0.109	0.109	0.8	85.5	1.1				
ALW-alw	15 cm	24 h	362	0.028	0.112	0.109	0.3	82.0	0.6				
THW-thw	0.50 h	25 h	358	0.232	1.064	1.040	11.5	33.0	20.1				
TLW-tlw	0.50 h	25 h	362	-0.292	1.094	1.055	24.6	35.4	10.8				

Table A47: Water level skill assessment metrics at Dog River Bridge, AL
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.23 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			87401	0.184									
h			87401	0.163									
H-h	15 cm	24 h	87401	0.020	0.104	0.102	0.6	86.5	0.5	24.0	10.0	0.61	0.95
AHW-ahw	15 cm	24 h	380	0.013	0.092	0.092	0.5	91.8	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	379	0.028	0.106	0.102	0.5	84.4	0.5	0.0	0.0		
THW-thw	0.50 h	25 h	380	0.236	1.049	1.024	10.3	35.0	21.3	23.4	94.6		
TLW-tlw	0.50 h	25 h	379	-0.229	1.015	0.990	19.5	32.2	9.0	73.6	0.0		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1403	0.024	0.105	0.103	0.6	86.1	0.6	36.0	18.0	0.78	
H006-h006	15 cm	24 h	1403	0.025	0.107	0.104	0.6	86.0	0.5	18.0	12.0	0.64	
H012-h012	15 cm	24 h	1403	0.025	0.110	0.107	0.5	85.0	0.8	6.0	12.0	0.78	
H018-h018	15 cm	24 h	1403	0.026	0.112	0.109	0.4	84.6	0.9	6.0	12.0	0.86	
H024-h024	15 cm	24 h	1403	0.026	0.114	0.111	0.3	84.5	1.3	6.0	12.0	0.86	
H030-h030	15 cm	24 h	1402	0.026	0.116	0.113	0.4	83.4	1.6	12.0	24.0	1.21	
H036-h036	15 cm	24 h	1401	0.026	0.122	0.119	0.5	82.8	1.8	12.0	30.0	1.28	
H042-h042	15 cm	24 h	1400	0.025	0.122	0.120	0.5	82.8	1.3	6.0	12.0	1.14	
H048-h048	15 cm	24 h	1399	0.025	0.122	0.119	0.6	81.3	1.3	24.0	12.0	0.93	
AHW-ahw	15 cm	24 h	367	0.014	0.097	0.097	0.5	89.1	0.8				
ALW-alw	15 cm	24 h	363	0.032	0.107	0.102	0.3	84.3	0.6				
THW-thw	0.50 h	25 h	367	0.279	1.096	1.062	10.9	36.2	24.3				
TLW-tlw	0.50 h	25 h	363	-0.207	1.080	1.062	20.9	33.6	14.0				

Table A48: Water level skill assessment metrics at East Fowl River Bridge, AL
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.179									
h			87453	0.169									
H-h	15 cm	24 h	87453	0.010	0.101	0.101	0.6	87.4	0.1	48.1	5.9	0.14	0.95
AHW-ahw	15 cm	24 h	371	0.011	0.088	0.088	0.3	91.1	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	367	0.012	0.099	0.099	0.5	87.5	0.3	0.0	0.0		
THW-thw	0.50 h	25 h	371	0.233	1.056	1.031	8.1	34.8	21.3	0.0	49.3		
TLW-tlw	0.50 h	25 h	367	-0.391	1.049	0.975	26.4	33.8	7.6	96.3	45.9		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	0.012	0.102	0.101	0.6	86.8	0.1	42.0	0.0	0.14	
H006-h006	15 cm	24 h	1404	0.014	0.102	0.101	0.6	87.5	0.1	36.0	0.0	0.14	
H012-h012	15 cm	24 h	1404	0.014	0.103	0.102	0.5	86.5	0.3	12.0	0.0	0.36	
H018-h018	15 cm	24 h	1404	0.015	0.105	0.104	0.4	85.1	0.4	12.0	0.0	0.36	
H024-h024	15 cm	24 h	1404	0.015	0.109	0.108	0.4	85.5	0.7	6.0	6.0	0.64	
H030-h030	15 cm	24 h	1403	0.014	0.110	0.109	0.5	84.9	0.6	6.0	6.0	0.57	
H036-h036	15 cm	24 h	1402	0.014	0.112	0.111	0.6	83.8	0.6	12.0	6.0	0.57	
H042-h042	15 cm	24 h	1401	0.013	0.116	0.115	0.9	83.5	0.7	36.0	6.0	0.64	
H048-h048	15 cm	24 h	1400	0.013	0.117	0.116	0.8	82.9	0.8	18.0	6.0	0.64	
AHW-ahw	15 cm	24 h	355	0.008	0.095	0.095	0.6	89.3	0.3				
ALW-alw	15 cm	24 h	356	0.018	0.102	0.101	0.6	86.0	0.8				
THW-thw	0.50 h	25 h	355	0.212	1.039	1.018	9.0	37.5	22.0				
TLW-tlw	0.50 h	25 h	356	-0.297	1.120	1.082	25.6	30.3	12.1				

Table A49: Water level skill assessment metrics at West Fowl River Bridge, AL
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			87453	0.154									
h			87453	0.178									
H-h	15 cm	24 h	87453	-0.025	0.115	0.112	1.2	86.6	0.1	49.1	3.7	0.45	0.93
AHW-ahw	15 cm	24 h	346	-0.039	0.109	0.102	1.2	86.7	0.3	0.0	0.0		
ALW-alw	15 cm	24 h	347	0.007	0.114	0.114	1.2	86.5	0.3	0.0	0.0		
THW-thw	0.50 h	25 h	346	-0.068	1.199	1.199	19.4	24.9	18.8	49.1	24.9		
TLW-tlw	0.50 h	25 h	347	-0.286	1.249	1.217	29.7	26.5	14.4	74.1	24.0		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1404	-0.026	0.114	0.111	1.2	86.5	0.1	48.0	0.0	0.28	
H006-h006	15 cm	24 h	1404	-0.025	0.121	0.118	1.4	85.8	0.0	24.0	0.0	0.43	
H012-h012	15 cm	24 h	1404	-0.024	0.124	0.121	1.4	84.0	0.2	18.0	0.0	0.43	
H018-h018	15 cm	24 h	1404	-0.022	0.120	0.118	1.1	83.1	0.4	12.0	0.0	0.36	
H024-h024	15 cm	24 h	1404	-0.024	0.122	0.120	1.2	83.4	0.5	42.0	0.0	0.43	
H030-h030	15 cm	24 h	1403	-0.024	0.121	0.119	1.3	82.4	0.4	18.0	6.0	0.50	
H036-h036	15 cm	24 h	1402	-0.025	0.131	0.129	1.3	82.2	0.9	18.0	6.0	0.64	
H042-h042	15 cm	24 h	1401	-0.023	0.123	0.121	1.2	80.8	0.9	24.0	6.0	0.64	
H048-h048	15 cm	24 h	1400	-0.024	0.124	0.122	1.2	80.4	0.9	24.0	6.0	0.71	
AHW-ahw	15 cm	24 h	334	-0.040	0.110	0.102	0.3	85.3	0.3				
ALW-alw	15 cm	24 h	326	0.009	0.115	0.115	0.9	87.1	0.6				
THW-thw	0.50 h	25 h	334	-0.001	1.319	1.321	21.9	28.4	21.0				
TLW-tlw	0.50 h	25 h	326	-0.411	1.278	1.212	30.4	28.8	11.3				

Table A50: Water level skill assessment metrics at Bayou La Batre Bridge, AL
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			87453	0.157									
h			87453	0.168									
H-h	15 cm	24 h	87453	-0.011	0.104	0.103	0.9	88.1	0.1	29.8	3.0	0.20	0.94
AHW-ahw	15 cm	24 h	358	-0.038	0.112	0.105	1.4	84.6	0.3	0.0	0.0		
ALW-alw	15 cm	24 h	358	0.028	0.107	0.104	0.6	84.1	0.3	0.0	0.0		
THW-thw	0.50 h	25 h	358	0.205	1.245	1.230	14.0	33.0	24.0	24.2	24.7		
TLW-tlw	0.50 h	25 h	358	-0.090	1.148	1.146	19.6	30.7	13.7	97.4	24.3		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	-0.013	0.105	0.104	1.2	88.2	0.1	30.0	0.0	0.21	
H006-h006	15 cm	24 h	1404	-0.012	0.107	0.106	0.9	87.5	0.2	12.0	0.0	0.21	
H012-h012	15 cm	24 h	1404	-0.011	0.111	0.110	0.9	86.3	0.4	12.0	0.0	0.50	
H018-h018	15 cm	24 h	1404	-0.010	0.111	0.110	0.8	84.6	0.4	12.0	0.0	0.43	
H024-h024	15 cm	24 h	1404	-0.011	0.110	0.110	0.7	85.3	0.4	6.0	0.0	0.43	
H030-h030	15 cm	24 h	1403	-0.010	0.113	0.113	0.7	84.5	0.6	6.0	6.0	0.57	
H036-h036	15 cm	24 h	1402	-0.011	0.117	0.117	0.9	82.9	0.9	12.0	6.0	0.71	
H042-h042	15 cm	24 h	1401	-0.011	0.117	0.117	0.9	82.9	0.8	18.0	6.0	0.57	
H048-h048	15 cm	24 h	1400	-0.013	0.120	0.119	1.2	82.4	1.1	24.0	6.0	0.79	
AHW-ahw	15 cm	24 h	339	-0.039	0.118	0.112	1.2	82.0	0.3				
ALW-alw	15 cm	24 h	335	0.034	0.109	0.103	0.0	84.8	0.6				
THW-thw	0.50 h	25 h	339	0.245	1.261	1.239	13.0	32.7	25.4				
TLW-tlw	0.50 h	25 h	335	-0.147	1.163	1.155	22.4	33.7	13.7				

Table A51: Water level skill assessment metrics at Weeks Bay, AL
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.23 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H			69907	0.175									
h			69907	0.216									
H-h	15 cm	24 h	69907	-0.041	0.100	0.092	1.0	91.2	0.0	40.6	0.0	0.32	0.94
AHW-ahw	15 cm	24 h	299	-0.048	0.095	0.082	1.3	90.6	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	307	-0.030	0.090	0.085	0.7	91.9	0.0	0.0	0.0		
THW-thw	0.50 h	25 h	299	0.370	1.215	1.160	10.4	29.1	28.4	24.3	24.6		
TLW-tlw	0.50 h	25 h	307	-0.245	1.157	1.132	24.4	24.8	14.3	24.8	13.5		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
H000-h000	15 cm	24 h	1108	-0.043	0.105	0.096	1.1	90.4	0.0	60.0	0.0	0.36	
H006-h006	15 cm	24 h	1107	-0.041	0.114	0.106	1.3	90.2	0.1	60.0	0.0	0.54	
H012-h012	15 cm	24 h	1106	-0.041	0.114	0.107	1.1	89.8	0.1	48.0	0.0	0.45	
H018-h018	15 cm	24 h	1105	-0.038	0.107	0.099	1.0	88.5	0.1	18.0	0.0	0.18	
H024-h024	15 cm	24 h	1104	-0.038	0.106	0.099	0.9	88.6	0.3	6.0	6.0	0.27	
H030-h030	15 cm	24 h	1103	-0.039	0.108	0.101	0.7	87.9	0.2	12.0	0.0	0.27	
H036-h036	15 cm	24 h	1102	-0.040	0.112	0.105	1.1	86.6	0.2	12.0	0.0	0.36	
H042-h042	15 cm	24 h	1101	-0.041	0.112	0.104	1.1	86.5	0.3	18.0	0.0	0.18	
H048-h048	15 cm	24 h	1100	-0.040	0.110	0.102	1.4	85.6	0.3	24.0	0.0	0.18	
AHW-ahw	15 cm	24 h	290	-0.050	0.097	0.083	1.0	90.3	0.0				
ALW-alw	15 cm	24 h	293	-0.025	0.089	0.085	0.3	91.8	0.0				
THW-thw	0.50 h	25 h	290	0.291	1.206	1.172	12.1	30.7	24.5				
TLW-tlw	0.50 h	25 h	293	-0.270	1.167	1.137	25.3	32.8	15.4				

Table A52: Water level skill assessment metrics at Panama City, FL
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
H			87453	0.145									
h			87453	0.146									
H-h	15 cm	24 h	87453	-0.001	0.083	0.083	0.0	94.2	0.0	0.0	0.0	0.00	0.96
AHW-ahw	15 cm	24 h	348	-0.013	0.070	0.069	0.0	99.4	0.0	0.0	0.0		
ALW-alw	15 cm	24 h	355	0.030	0.086	0.081	0.0	91.0	0.0	0.0	0.0		
THW-thw	0.50 h	25 h	348	-0.957	1.358	0.966	44.0	31.0	1.1	48.5	0.0		
TLW-tlw	0.50 h	25 h	355	-0.831	1.300	1.000	37.2	34.1	1.4	86.0	23.6		
SCENARIO: SEMI-OPERATIONAL FORECAST													
H000-h000	15 cm	24 h	1404	-0.001	0.084	0.084	0.0	92.8	0.0	0.0	0.0	0.00	
H006-h006	15 cm	24 h	1404	-0.004	0.090	0.090	0.1	91.3	0.1	0.0	0.0	0.07	
H012-h012	15 cm	24 h	1404	-0.005	0.096	0.096	0.4	89.9	0.3	6.0	6.0	0.21	
H018-h018	15 cm	24 h	1404	-0.006	0.101	0.101	0.4	87.4	0.3	12.0	6.0	0.28	
H024-h024	15 cm	24 h	1404	-0.007	0.105	0.105	0.5	85.8	0.4	12.0	12.0	0.36	
H030-h030	15 cm	24 h	1403	-0.008	0.108	0.108	0.7	85.7	0.7	18.0	12.0	0.71	
H036-h036	15 cm	24 h	1402	-0.009	0.112	0.111	0.7	84.6	0.6	12.0	12.0	0.50	
H042-h042	15 cm	24 h	1401	-0.010	0.115	0.115	0.7	83.0	0.6	30.0	6.0	0.57	
H048-h048	15 cm	24 h	1400	-0.010	0.119	0.119	1.0	82.0	0.8	60.0	6.0	0.86	
AHW-ahw	15 cm	24 h	328	-0.023	0.093	0.090	0.6	91.5	0.3				
ALW-alw	15 cm	24 h	339	0.031	0.097	0.093	0.0	88.5	0.6				
THW-thw	0.50 h	25 h	328	-0.889	1.340	1.004	46.3	22.3	3.7				
TLW-tlw	0.50 h	25 h	339	-0.887	1.373	1.050	43.1	22.1	4.1				

APPENDIX B: TIME SERIES OF MODELED WATER LEVEL VERSUS OBSERVATIONS
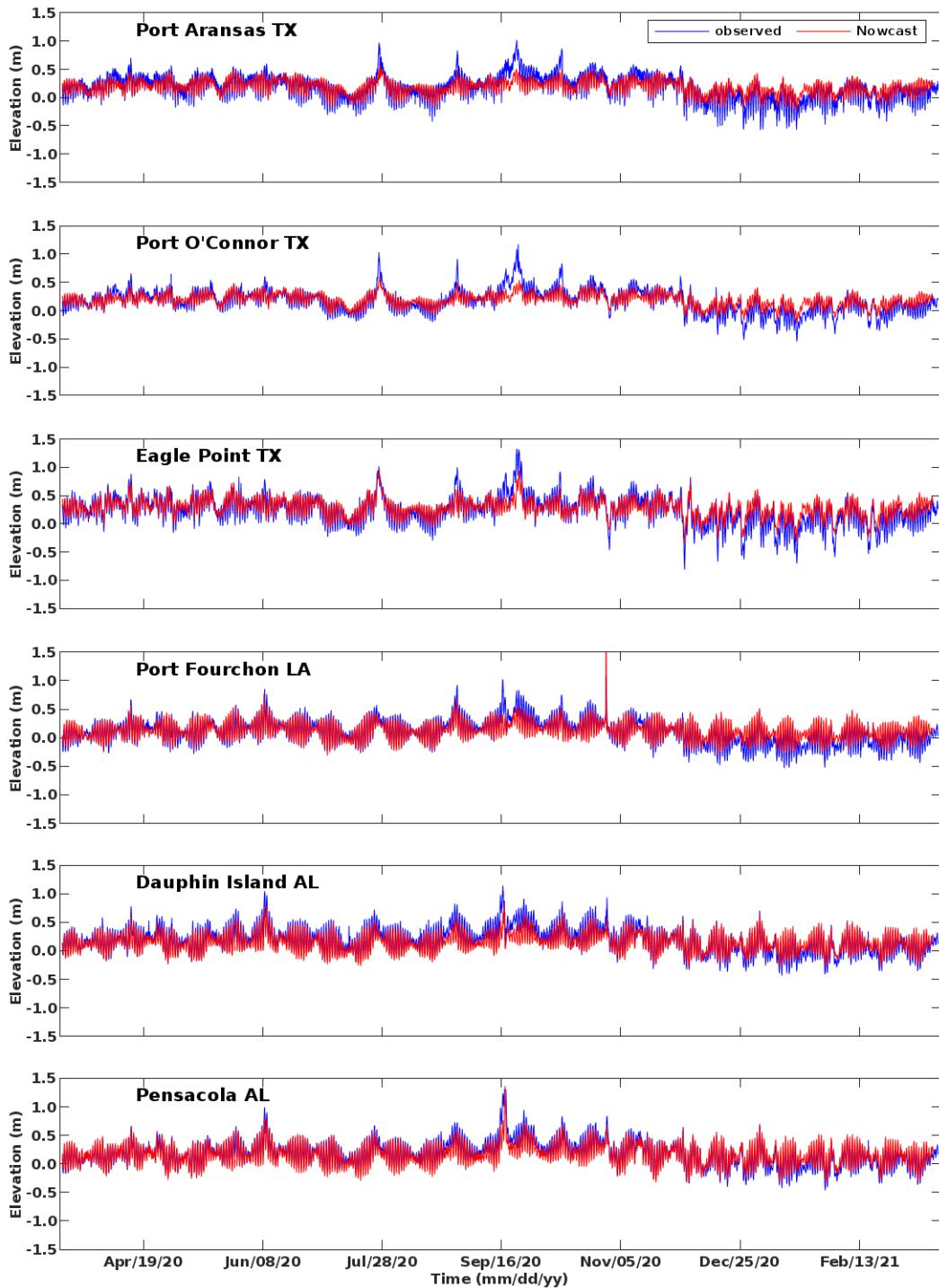
Figure B-1. Time series of modeled (red) versus observed (blue) water levels at stations (from upper to lower): Port Aransas, TX; Port O'Connor, TX; Eagle Point, TX; Port Fourchon, LA; Dauphin Island, AL, and Pensacola, AL.
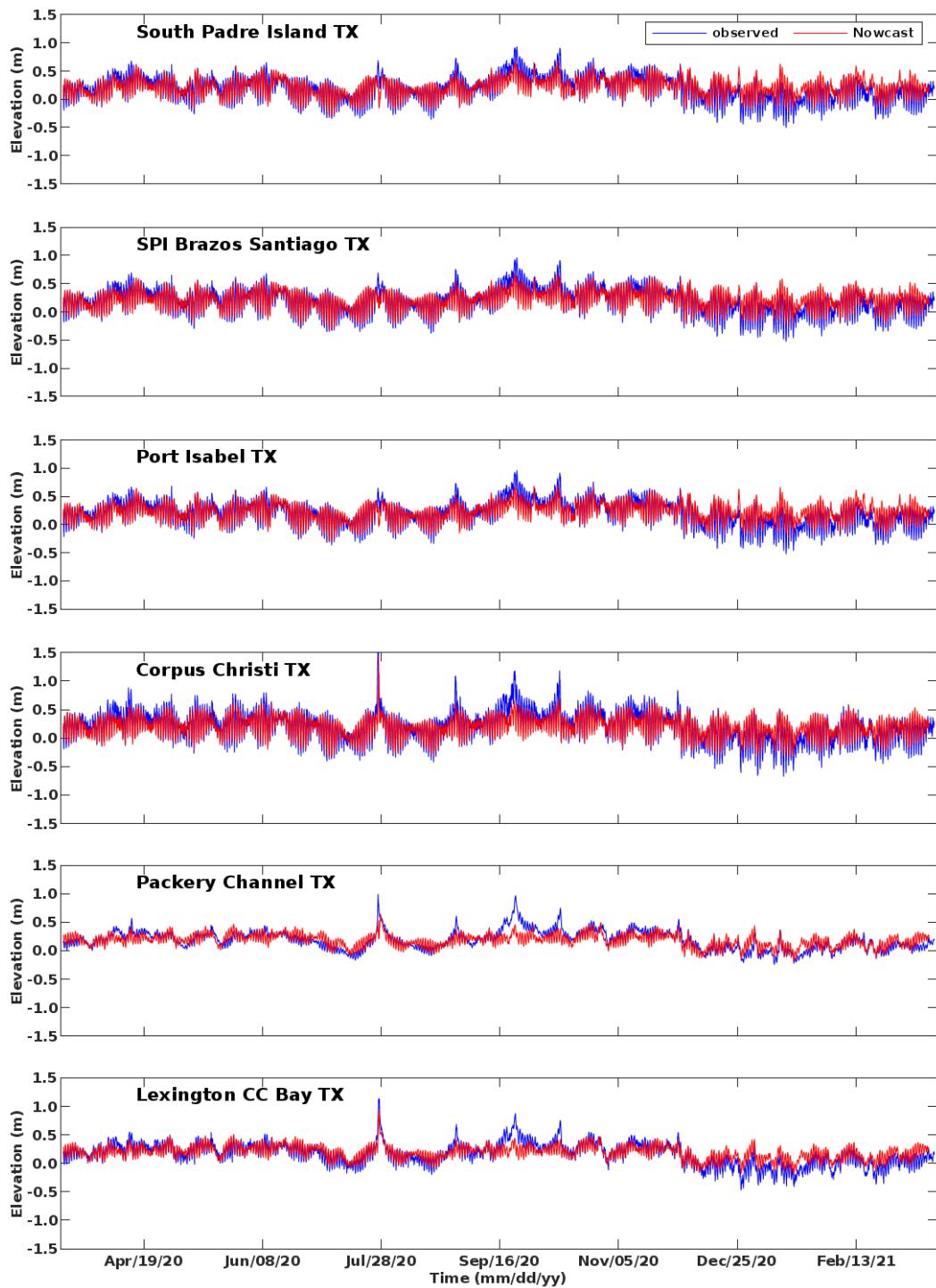
Figure B-2. Time series of modeled (red) versus observed (blue) water levels at stations (from upper to lower): South Padre Island, TX; SPI Brazos Santiago, TX; Port Isabel, TX; Corpus Christi, TX; Packery Channel, TX; and Lexington Corpus Christi Bay, TX.

B-2
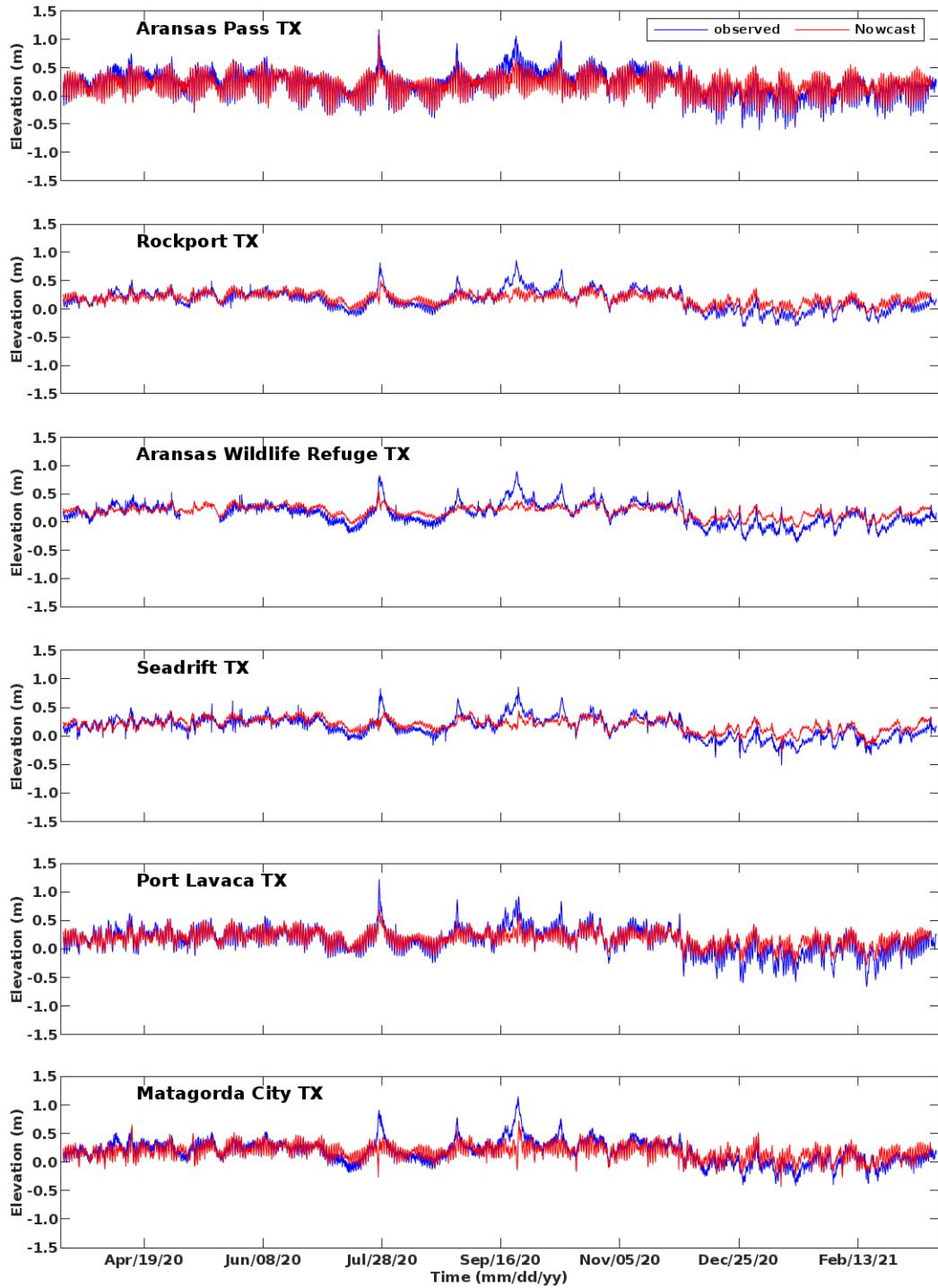
Figure B-3. Time series of modeled (red) versus observed (blue) water levels at stations (from upper to lower): Aransas Pass, TX; Rockport, TX; Aransas Wildlife Refuge, TX; Seadrift, TX; Port Lavaca, TX; and Matagorda City, TX.
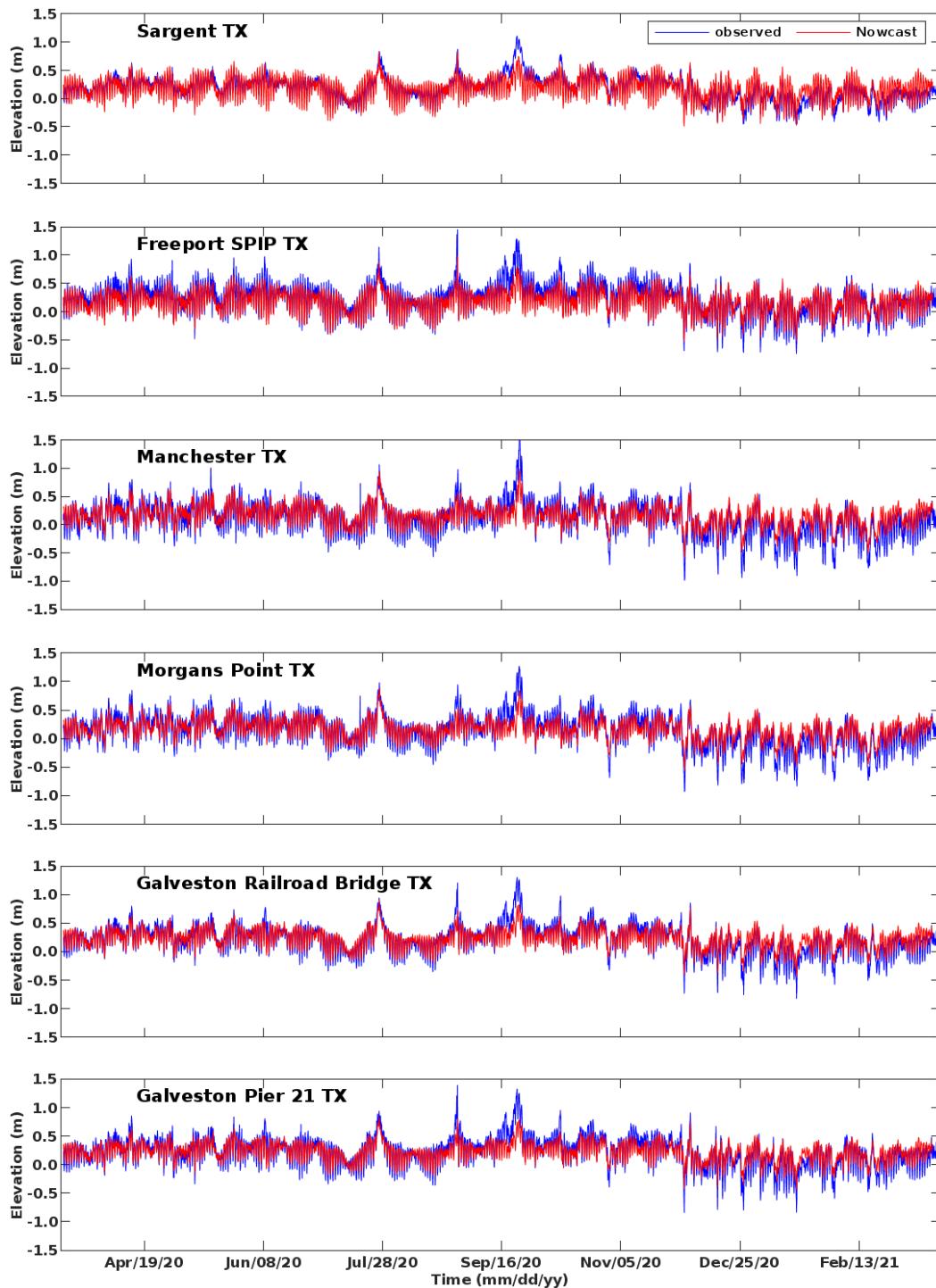
Figure B-4. Time series of modeled (red) versus observed (blue) water levels at stations (from upper to lower): Sargent, TX; Freeport SPIP, TX; Manchester, TX; Morgans Point, TX; Galveston Railroad Bridge, TX; and Galveston Pier 21, TX.
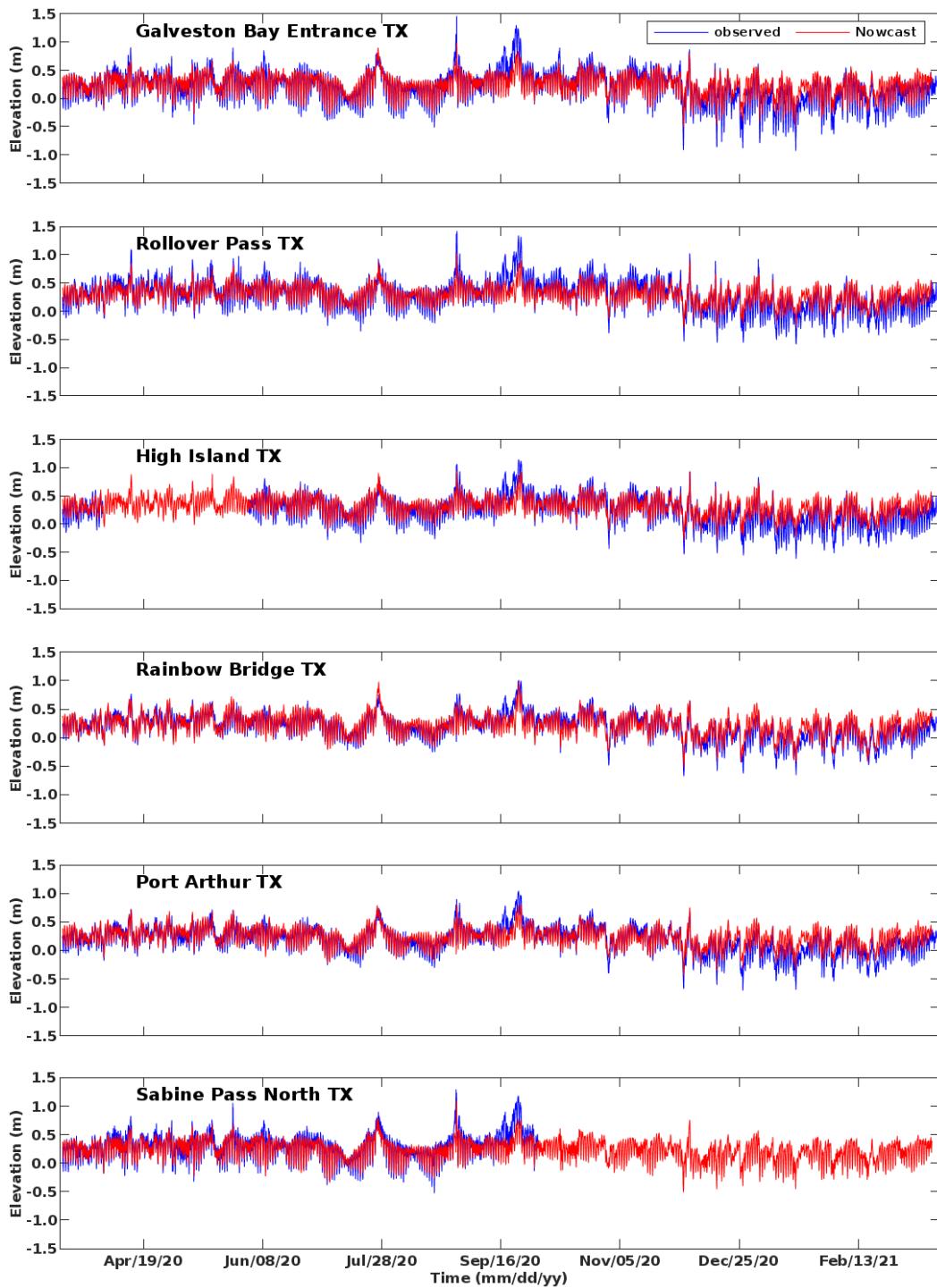
Figure B-5. Time series of modeled (red) versus observed (blue) water levels at stations (from upper to lower): Galveston Bay Entrance, TX; Rollover Pass, TX; High Island, TX; Rainbow Bridge, TX; Port Arthur, TX; and Sabine Pass North, TX.
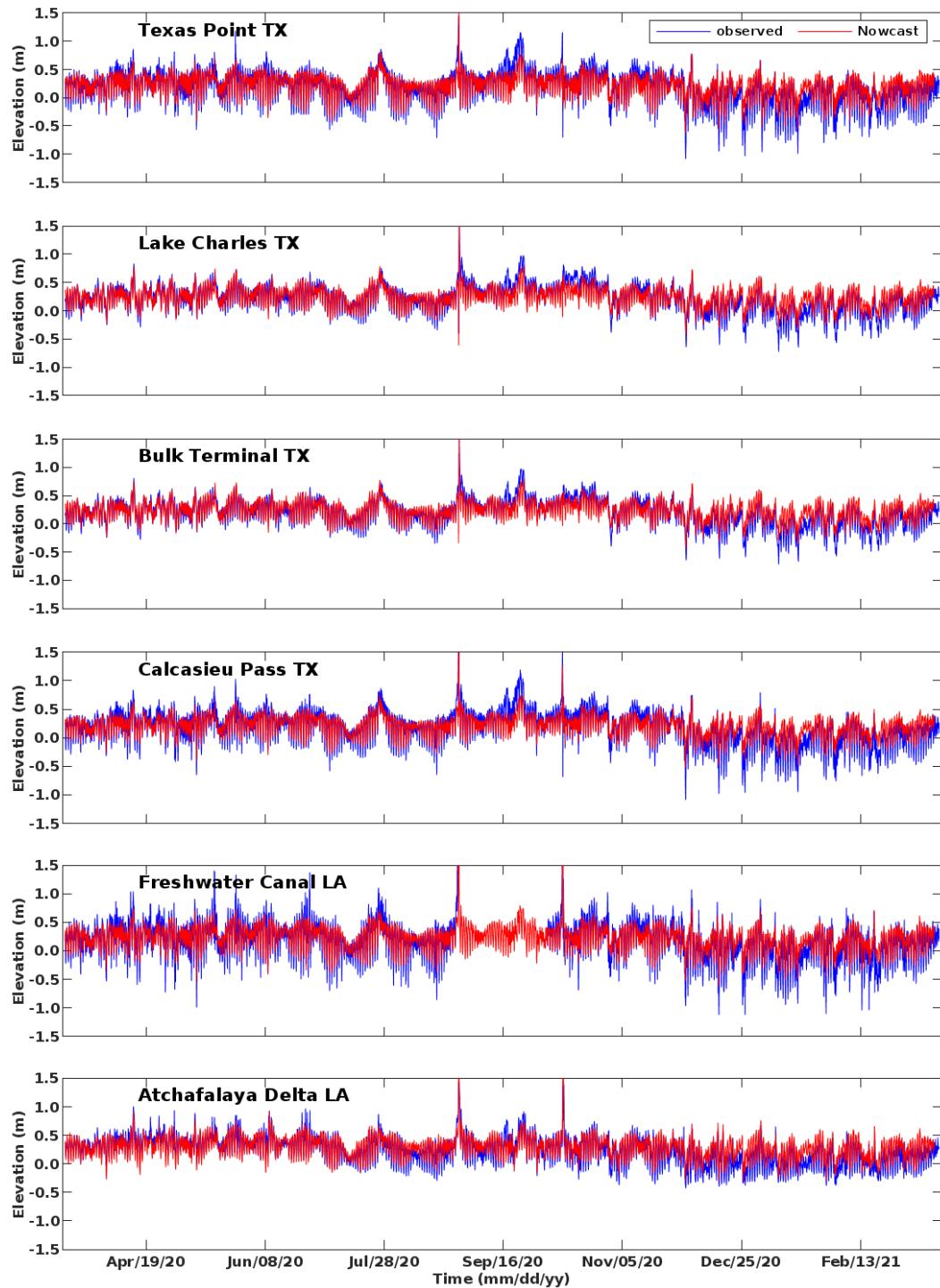
Figure B-6. Time series of modeled (red) versus observed (blue) water levels at stations (from upper to lower): Texas Point, TX; Lake Charles, TX; Bulk Terminal, TX; Calcasieu Pass, TX; Freshwater Canal, LA; and Atchafalaya Delta, LA.
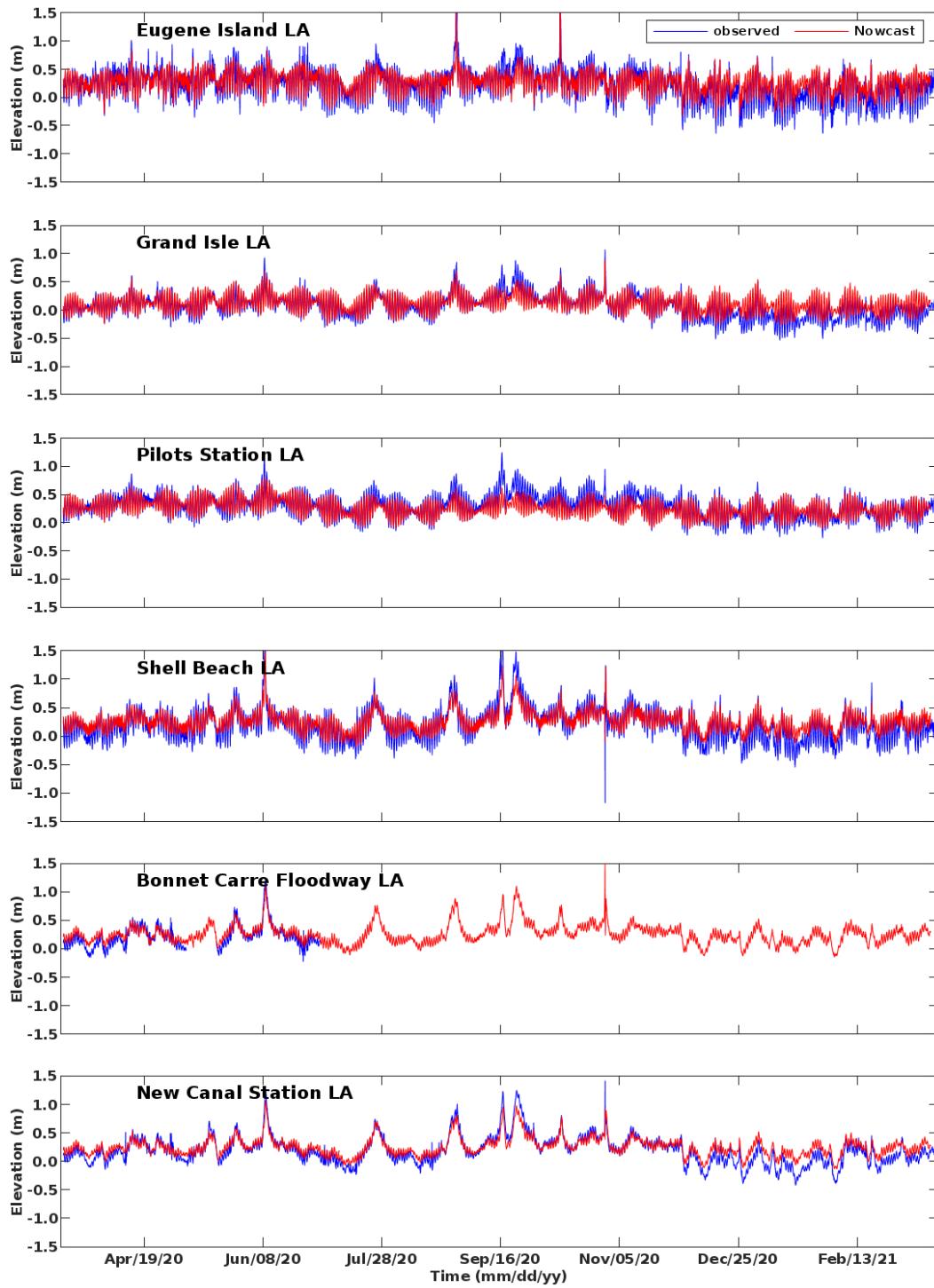
Figure B-7. Time series of modeled (red) versus observed (blue) water levels at stations (from upper to lower): Eugene Island, LA; Grand Isle, LA; Pilots Station, LA; Shell Beach, LA; I-10 Bonnet Carre Floodway, LA; and New Canal Station, LA.
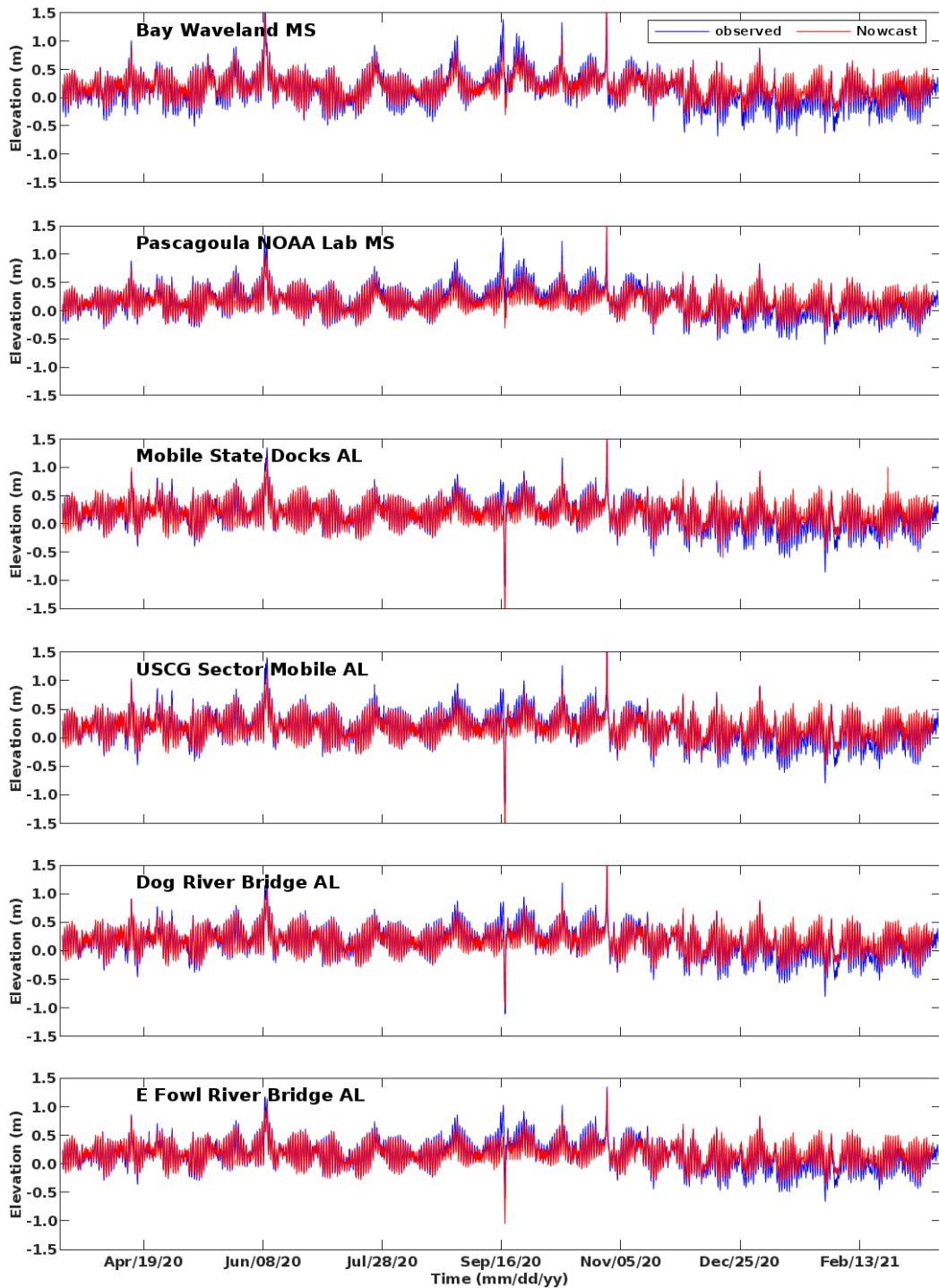
Figure B-8. Time series of modeled (red) versus observed (blue) water levels at stations (from upper to lower): Bay Waveland, MS; Pascagoula NOAA Lab, MS; Mobile State Docks, AL; USCG Sector Mobile, AL; Dog River Bridge, AL; and East Fowl River Bridge, AL.

B-8
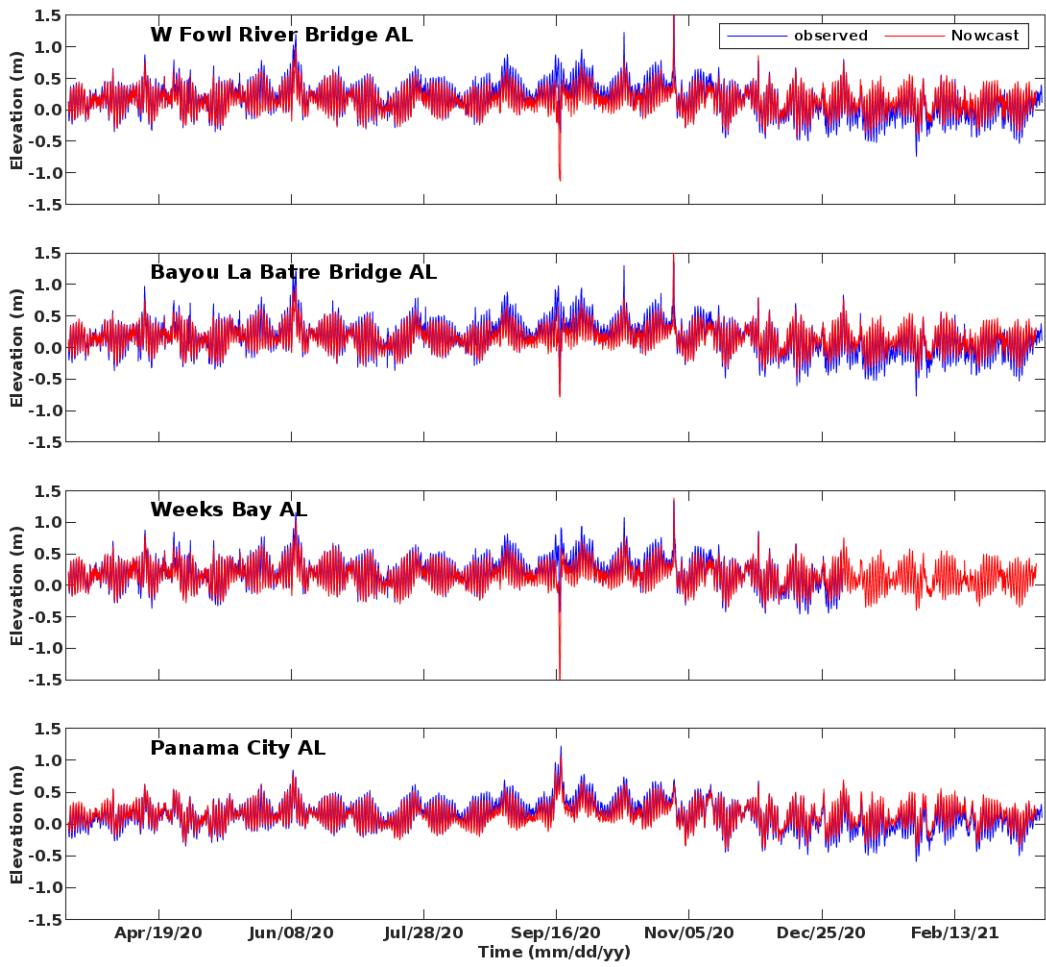
Figure B-9. Time series of modeled (red) versus observed (blue) water levels at stations (from upper to lower): West Fowl River Bridge, AL; Bayou La Batre Bridge, AL; Weeks Bay, LA; and Panama City, FL.

APPENDIX C: WATER TEMPERATURE SKILL ASSESSMENT METRICS TABLES

Table C1: Water temperature skill assessment metrics at Pensacola, FL
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			87453	23.311									
t			87453	22.987									
T-t	3.0ºC	24 h	87453	0.325	0.919	0.860	0.0	99.9	0.0	0.0	3.1		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1404	0.339	0.911	0.846	0.0	100.0	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1404	0.340	0.905	0.839	0.0	100.0	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1404	0.339	0.901	0.835	0.0	100.0	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1404	0.337	0.916	0.853	0.0	100.0	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1404	0.330	0.927	0.866	0.0	100.0	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1403	0.313	0.931	0.877	0.0	100.0	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1402	0.290	0.919	0.872	0.0	100.0	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1401	0.275	0.932	0.891	0.0	99.9	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1400	0.251	0.939	0.905	0.0	100.0	0.0	0.0	0.0		

Table C2: Water temperature skill assessment metrics at Coast Guard Mobile, AL
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.25 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			87395	22.158									
t			87395	22.273									
T-t	3.0ºC	24 h	87395	-0.115	1.297	1.292	0.0	98.6	0.0	0.0	0.0		0.99
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1403	-0.136	1.322	1.315	0.0	98.2	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1403	-0.155	1.324	1.315	0.0	98.0	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1403	-0.166	1.326	1.316	0.0	98.2	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1403	-0.175	1.338	1.327	0.0	98.1	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1403	-0.192	1.352	1.339	0.0	97.8	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1402	-0.206	1.357	1.342	0.0	97.6	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1401	-0.220	1.352	1.334	0.0	97.6	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1400	-0.228	1.362	1.343	0.0	97.4	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1399	-0.239	1.375	1.355	0.0	97.5	0.0	0.0	0.0		

Table C3: Water temperature skill assessment metrics at Amerada Pass, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			87453	20.369									
t			87453	20.659									
T-t	3.0ºC	24 h	87453	-0.290	2.584	2.567	1.6	93.5	0.0	140.4	0.0		0.97
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1404	-0.318	2.620	2.601	1.7	93.8	0.0	132.0	0.0		
T006-t006	3.0ºC	24 h	1404	-0.334	2.602	2.582	1.7	93.7	0.0	132.0	0.0		
T012-t012	3.0ºC	24 h	1404	-0.347	2.604	2.582	1.6	93.7	0.0	132.0	0.0		
T018-t018	3.0ºC	24 h	1404	-0.361	2.604	2.580	1.6	93.8	0.0	120.0	0.0		
T024-t024	3.0ºC	24 h	1404	-0.375	2.592	2.565	1.7	93.7	0.0	126.0	0.0		
T030-t030	3.0ºC	24 h	1403	-0.401	2.626	2.596	1.8	93.5	0.0	138.0	0.0		
T036-t036	3.0ºC	24 h	1402	-0.435	2.685	2.651	1.7	93.8	0.0	138.0	0.0		
T042-t042	3.0ºC	24 h	1401	-0.462	2.729	2.691	1.7	93.9	0.0	138.0	0.0		
T048-t048	3.0ºC	24 h	1400	-0.494	2.805	2.763	1.7	93.7	0.0	132.0	0.0		

Table C4: Water temperature skill assessment metrics at Morgans Point, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 76.72 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			69163	21.254									
t			69163	21.613									
T-t	3.0ºC	24 h	69163	-0.358	1.036	0.972	0.0	98.6	0.0	0.0	0.0		0.99
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1130	-0.339	1.030	0.973	0.0	98.2	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1131	-0.347	1.027	0.967	0.0	98.2	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1132	-0.364	1.032	0.967	0.0	98.6	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1133	-0.379	1.050	0.979	0.0	98.4	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1133	-0.397	1.066	0.990	0.0	98.5	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1132	-0.416	1.079	0.996	0.0	98.1	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1131	-0.432	1.086	0.997	0.0	97.9	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1130	-0.448	1.103	1.008	0.0	97.9	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1129	-0.460	1.116	1.017	0.0	97.7	0.0	0.0	0.0		

Table C5: Water temperature skill assessment metrics at Corpus Christi, TX
Observed data time period: 3/15/2020 to 6/3/2020 with gaps of 1.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			19018	24.245									
t			19018	25.967									
T-t	3.0ºC	24 h	19018	-1.723	2.318	1.552	1.7	81.4	0.0	22.1	0.0		0.85

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	274	-1.567	2.155	1.481	0.7	85.8	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	273	-1.601	2.197	1.507	0.7	85.7	0.0	6.0	0.0		
T012-t012	3.0ºC	24 h	272	-1.647	2.254	1.542	1.5	84.2	0.0	12.0	0.0		
T018-t018	3.0ºC	24 h	271	-1.696	2.313	1.577	2.6	84.1	0.0	18.0	0.0		
T024-t024	3.0ºC	24 h	270	-1.741	2.364	1.602	2.6	83.3	0.0	24.0	0.0		
T030-t030	3.0ºC	24 h	269	-1.781	2.414	1.632	2.6	81.4	0.0	30.0	0.0		
T036-t036	3.0ºC	24 h	268	-1.820	2.458	1.655	3.4	79.9	0.0	36.0	0.0		
T042-t042	3.0ºC	24 h	267	-1.860	2.506	1.682	3.7	79.4	0.0	54.0	0.0		
T048-t048	3.0ºC	24 h	266	-1.887	2.541	1.705	3.8	78.9	0.0	42.0	0.0		

Table C6: Water temperature skill assessment metrics at Calcasieu Pass, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 1.74 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			87037	23.075									
t			87037	22.303									
T-t	3.0ºC	24 h	87037	0.772	1.324	1.076	0.0	98.3	0.0	0.0	0.0		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1400	0.773	1.336	1.090	0.0	97.9	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1401	0.761	1.329	1.090	0.0	97.9	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1401	0.759	1.337	1.102	0.0	97.9	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1401	0.750	1.336	1.106	0.0	97.9	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1401	0.732	1.335	1.116	0.0	97.7	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1399	0.707	1.323	1.118	0.0	97.9	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1397	0.694	1.318	1.121	0.0	98.0	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1395	0.676	1.314	1.128	0.0	98.1	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1393	0.665	1.316	1.136	0.0	97.7	0.0	0.0	0.0		

Table C7: Water temperature skill assessment metrics at Mobile State Docks, AL
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 3.64 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			86589	21.717									
t			86589	21.455									
T-t	3.0ºC	24 h	86589	0.262	0.673	0.620	0.0	100.0	0.0	0.0	0.0		1.00

SCENARIO: SEMI-OPERATIONA L FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1392	0.264	0.679	0.626	0.0	100.0	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1391	0.258	0.696	0.647	0.0	100.0	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1390	0.250	0.730	0.686	0.0	100.0	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1390	0.251	0.784	0.743	0.0	99.9	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1390	0.246	0.832	0.795	0.0	99.9	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1390	0.245	0.874	0.839	0.0	99.9	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1390	0.245	0.916	0.883	0.0	99.7	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1389	0.248	0.963	0.931	0.0	99.5	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1388	0.249	1.015	0.984	0.0	99.3	0.0	0.0	0.0		

Table C8: Water temperature skill assessment metrics at Weeks Bay, AL
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			87453	22.052									
t			87453	23.169									
T-t	3.0ºC	24 h	87453	-1.117	2.314	2.026	1.1	79.6	0.1	24.7	3.3		0.97

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1404	-1.175	2.306	1.985	1.1	79.0	0.1	42.0	0.0		
T006-t006	3.0ºC	24 h	1404	-1.190	2.312	1.983	1.0	79.0	0.1	42.0	0.0		
T012-t012	3.0ºC	24 h	1404	-1.211	2.325	1.986	1.1	79.1	0.1	42.0	0.0		
T018-t018	3.0ºC	24 h	1404	-1.230	2.332	1.982	1.1	79.3	0.1	24.0	0.0		
T024-t024	3.0ºC	24 h	1404	-1.251	2.337	1.975	1.1	78.8	0.1	42.0	0.0		
T030-t030	3.0ºC	24 h	1403	-1.273	2.342	1.967	1.4	78.8	0.1	48.0	0.0		
T036-t036	3.0ºC	24 h	1402	-1.296	2.366	1.979	1.4	78.2	0.1	48.0	0.0		
T042-t042	3.0ºC	24 h	1401	-1.311	2.374	1.979	1.3	78.3	0.1	42.0	0.0		
T048-t048	3.0ºC	24 h	1400	-1.332	2.381	1.975	1.2	77.6	0.1	24.0	0.0		

Table C9: Water temperature skill assessment metrics at Dauphin Island Hydro, AL
Observed data time period: 3/15/2020 to 10/5/2020 with gaps of 0.94 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			48655	27.244									
t			48655	26.539									
T-t	3.0ºC	24 h	48655	0.705	1.045	0.771	0.0	99.8	0.0	0.0	0.0		0.98
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	757	0.731	1.043	0.745	0.0	100.0	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	756	0.709	1.030	0.748	0.0	100.0	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	755	0.687	1.033	0.772	0.0	99.9	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	754	0.664	1.036	0.795	0.0	99.7	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	753	0.637	1.031	0.811	0.0	99.6	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	752	0.604	1.016	0.818	0.0	99.6	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	751	0.581	1.033	0.855	0.0	99.7	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	750	0.566	1.051	0.886	0.0	99.6	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	749	0.537	1.063	0.919	0.0	99.5	0.0	0.0	0.0		

Table C10: Water temperature skill assessment metrics at Pascagoula NOAA Lab, MS
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			87453	22.885									
t			87453	22.206									
T-t	3.0ºC	24 h	87453	0.678	1.167	0.950	0.0	98.8	0.0	0.0	0.4		0.99
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1404	0.674	1.164	0.949	0.0	98.9	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1404	0.684	1.169	0.948	0.0	98.9	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1404	0.669	1.174	0.965	0.0	98.8	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1404	0.642	1.155	0.960	0.0	99.0	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1404	0.612	1.129	0.949	0.0	99.0	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1403	0.585	1.122	0.958	0.0	98.7	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1402	0.566	1.132	0.981	0.0	98.7	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1401	0.548	1.132	0.991	0.0	98.8	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1400	0.527	1.137	1.007	0.0	98.7	0.0	0.0	0.0		

Table C11: Water temperature skill assessment metrics at Bay Waveland, MS
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 2.29 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			86916	21.640									
t			86916	22.039									
T-t	3.0ºC	24 h	86916	-0.399	1.328	1.266	0.0	97.2	0.0	1.6	0.0		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1394	-0.417	1.325	1.259	0.0	97.3	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1394	-0.417	1.327	1.260	0.0	97.2	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1394	-0.424	1.340	1.272	0.0	97.0	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1394	-0.433	1.355	1.285	0.0	97.1	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1394	-0.448	1.358	1.282	0.0	96.6	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1393	-0.455	1.360	1.283	0.0	97.0	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1392	-0.464	1.377	1.297	0.0	96.3	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1391	-0.472	1.400	1.318	0.0	95.8	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1390	-0.491	1.407	1.319	0.0	96.1	0.0	0.0	0.0		

Table C12: Water temperature skill assessment metrics at New Canal Station, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			87453	22.795									
t			87453	22.326									
T-t	3.0ºC	24 h	87453	0.469	1.185	1.088	0.0	99.7	0.0	0.0	0.0		0.99
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1404	0.446	1.178	1.091	0.0	99.7	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1404	0.430	1.164	1.082	0.0	99.7	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1404	0.416	1.154	1.077	0.0	99.7	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1404	0.405	1.148	1.074	0.0	99.7	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1404	0.392	1.138	1.068	0.0	99.7	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1403	0.380	1.128	1.062	0.0	99.7	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1402	0.369	1.125	1.063	0.0	99.8	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1401	0.359	1.127	1.069	0.0	99.6	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1400	0.347	1.130	1.076	0.0	99.6	0.0	0.0	0.0		

Table C13: Water temperature skill assessment metrics at Shell Beach, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 3.56 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			86643	22.239									
t			86643	23.610									
T-t	3.0ºC	24 h	86643	-1.370	1.808	1.179	0.0	89.9	0.0	0.0	0.0		0.98

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1393	-1.400	1.829	1.178	0.0	89.4	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1392	-1.408	1.834	1.175	0.0	89.7	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1391	-1.418	1.842	1.176	0.0	89.6	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1391	-1.426	1.854	1.185	0.0	89.6	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1391	-1.433	1.854	1.178	0.0	89.5	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1390	-1.444	1.865	1.181	0.0	89.4	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1389	-1.456	1.882	1.193	0.0	89.1	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1388	-1.463	1.895	1.205	0.0	88.5	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1387	-1.472	1.908	1.214	0.0	88.5	0.0	0.0	0.0		

Table C14: Water temperature skill assessment metrics at Pilottown, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.73 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			87281	19.345									
t			87281	19.407									
T-t	3.0ºC	24 h	87281	-0.061	0.647	0.644	0.0	100.0	0.0	0.0	0.0		1.00

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1401	-0.054	0.657	0.655	0.0	100.0	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1401	-0.065	0.658	0.655	0.0	100.0	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1401	-0.068	0.659	0.656	0.0	100.0	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1401	-0.072	0.659	0.656	0.0	100.0	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1401	-0.077	0.662	0.657	0.0	100.0	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1400	-0.080	0.661	0.657	0.0	100.0	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1399	-0.080	0.662	0.657	0.0	100.0	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1398	-0.082	0.661	0.656	0.0	100.0	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1397	-0.086	0.662	0.657	0.0	100.0	0.0	0.0	0.0		

Table C15: Water temperature skill assessment metrics at Carrollton, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 1.08 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			87198	18.989									
t			87198	19.264									
T-t	3.0ºC	24 h	87198	-0.275	0.605	0.539	0.0	100.0	0.0	0.0	0.0		1.00

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1400	-0.263	0.607	0.547	0.0	100.0	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1400	-0.274	0.610	0.546	0.0	100.0	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1400	-0.279	0.611	0.544	0.0	100.0	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1400	-0.282	0.615	0.547	0.0	100.0	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1400	-0.286	0.619	0.549	0.0	100.0	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1399	-0.292	0.619	0.546	0.0	100.0	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1398	-0.292	0.617	0.544	0.0	100.0	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1397	-0.295	0.620	0.546	0.0	100.0	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1396	-0.298	0.624	0.548	0.0	100.0	0.0	0.0	0.0		

Table C16: Water temperature skill assessment metrics at Grand Isle, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			87453	23.092									
t			87453	23.304									
T-t	3.0ºC	24 h	87453	-0.212	1.099	1.079	0.0	98.3	0.0	0.0	0.0		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1404	-0.200	1.080	1.062	0.0	98.4	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1404	-0.215	1.080	1.059	0.0	98.4	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1404	-0.229	1.095	1.071	0.0	98.1	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1404	-0.250	1.094	1.065	0.0	98.4	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1404	-0.272	1.102	1.068	0.0	98.1	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1403	-0.282	1.115	1.079	0.0	98.1	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1402	-0.293	1.126	1.088	0.0	98.1	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1401	-0.311	1.138	1.095	0.0	98.0	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1400	-0.326	1.147	1.100	0.0	97.9	0.0	0.0	0.0		

Table C17: Water temperature skill assessment metrics at Eugene Island, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 77.79 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE CRITERION	X -	N -	IMAX -	SM -	RMSE -	SD -	NOF <1%	CF >90%	POF <1%	MDNO <N	MDPO <N	WOF <.5%	SKILL
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			68906	20.249									
t			68906	18.631									
T-t	3.0ºC	24 h	68906	1.618	2.183	1.466	0.0	82.7	0.4	0.0	5.5		0.98
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1129	1.610	2.191	1.487	0.0	83.1	0.4	0.0	0.0		
T006-t006	3.0ºC	24 h	1129	1.603	2.193	1.497	0.0	82.6	0.6	0.0	0.0		
T012-t012	3.0ºC	24 h	1129	1.595	2.189	1.499	0.0	82.5	0.5	0.0	0.0		
T018-t018	3.0ºC	24 h	1129	1.583	2.180	1.498	0.0	83.0	0.6	0.0	0.0		
T024-t024	3.0ºC	24 h	1129	1.561	2.175	1.515	0.0	82.8	0.8	0.0	0.0		
T030-t030	3.0ºC	24 h	1128	1.531	2.154	1.516	0.0	83.0	0.6	0.0	0.0		
T036-t036	3.0ºC	24 h	1127	1.502	2.139	1.523	0.0	83.3	0.9	0.0	0.0		
T042-t042	3.0ºC	24 h	1126	1.479	2.119	1.519	0.0	83.7	0.4	0.0	0.0		
T048-t048	3.0ºC	24 h	1125	1.453	2.102	1.520	0.0	84.4	0.4	0.0	0.0		

Table C18: Water temperature skill assessment metrics at Berwick, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 209.73 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			37180	14.316									
t			37180	14.952									
T-t	3.0ºC	24 h	37180	-0.635	1.784	1.667	0.3	91.4	0.0	10.3	0.0		0.98

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	581	-0.711	1.856	1.715	0.3	90.5	0.0	6.0	0.0		
T006-t006	3.0ºC	24 h	581	-0.736	1.863	1.712	0.3	90.5	0.0	6.0	0.0		
T012-t012	3.0ºC	24 h	581	-0.756	1.864	1.706	0.3	90.4	0.0	6.0	0.0		
T018-t018	3.0ºC	24 h	581	-0.776	1.868	1.700	0.3	90.2	0.0	6.0	0.0		
T024-t024	3.0ºC	24 h	581	-0.799	1.880	1.703	0.3	89.8	0.0	6.0	0.0		
T030-t030	3.0ºC	24 h	580	-0.817	1.885	1.701	0.3	90.0	0.0	6.0	0.0		
T036-t036	3.0ºC	24 h	579	-0.831	1.888	1.696	0.3	89.8	0.0	6.0	0.0		
T042-t042	3.0ºC	24 h	578	-0.850	1.893	1.693	0.3	89.8	0.0	6.0	0.0		
T048-t048	3.0ºC	24 h	577	-0.863	1.897	1.691	0.3	89.9	0.0	6.0	0.0		

Table C19: Water temperature skill assessment metrics at Freshwater Canal, LA
Observed data time period: 3/15/2020 to 8/27/2020 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

| VARIABLE | X | N | IMAX | SM | RMSE | SD | NOF | CF | POF | MDNO | MDPO | WOF | SKILL |
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			39484	27.354									
t			39484	27.512									
T-t	3.0ºC	24 h	39484	-0.158	1.184	1.174	0.0	97.5	0.0	0.0	0.0		0.97
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	604	-0.122	1.154	1.148	0.0	97.8	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	603	-0.147	1.151	1.143	0.0	97.7	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	602	-0.172	1.168	1.156	0.0	97.0	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	601	-0.207	1.180	1.163	0.0	96.7	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	600	-0.237	1.195	1.173	0.0	96.8	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	599	-0.277	1.206	1.175	0.0	96.8	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	598	-0.299	1.214	1.178	0.0	96.8	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	597	-0.330	1.235	1.192	0.0	96.1	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	596	-0.358	1.254	1.202	0.0	96.5	0.0	0.0	0.0		

Table C20: Water temperature skill assessment metrics at Lake Charles, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 20.36 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			82574	23.232									
t			82574	22.307									
T-t	3.0ºC	24 h	82574	0.925	1.328	0.953	0.0	98.6	0.1	0.0	9.3		0.99
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1323	0.919	1.331	0.964	0.0	98.6	0.1	0.0	0.0		
T006-t006	3.0ºC	24 h	1323	0.906	1.327	0.970	0.0	98.8	0.1	0.0	0.0		
T012-t012	3.0ºC	24 h	1323	0.887	1.319	0.976	0.0	98.6	0.2	0.0	6.0		
T018-t018	3.0ºC	24 h	1323	0.876	1.326	0.996	0.0	98.3	0.2	0.0	6.0		
T024-t024	3.0ºC	24 h	1323	0.868	1.332	1.011	0.0	98.3	0.2	0.0	6.0		
T030-t030	3.0ºC	24 h	1322	0.855	1.332	1.023	0.0	98.2	0.2	0.0	6.0		
T036-t036	3.0ºC	24 h	1321	0.850	1.347	1.046	0.0	98.0	0.2	0.0	6.0		
T042-t042	3.0ºC	24 h	1320	0.848	1.363	1.068	0.0	97.6	0.2	0.0	6.0		
T048-t048	3.0ºC	24 h	1319	0.847	1.386	1.097	0.0	97.2	0.2	0.0 12.0			

Table C21: Water temperature skill assessment metrics at Bulk Terminal, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE CRITERION	X -	N -	IMAX -	SM -	RMSE -	SD -	NOF <1%	CF >90%	POF <1%	MDNO <N	MDPO <N	WOF <.5%	SKILL
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			87453	23.162									
t			87453	23.288									
T-t	3.0ºC	24 h	87453	-0.125	1.212	1.206	0.0	97.0	0.0	0.0	0.0		0.99
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1404	-0.133	1.233	1.226	0.0	96.5	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1404	-0.136	1.232	1.225	0.0	96.5	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1404	-0.153	1.234	1.225	0.0	96.4	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1404	-0.162	1.244	1.234	0.0	96.2	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1404	-0.172	1.258	1.246	0.0	96.1	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1403	-0.186	1.261	1.247	0.0	96.2	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1402	-0.190	1.268	1.254	0.0	96.2	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1401	-0.196	1.282	1.267	0.0	96.0	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1400	-0.198	1.302	1.287	0.0	96.0	0.0	0.0	0.0		

Table C22: Water temperature skill assessment metrics at Port Arthur, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.35 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			87370	23.227									
t			87370	22.501									
T-t	3.0ºC	24 h	87370	0.726	1.134	0.872	0.0	100.0	0.0	0.0	0.0		0.99
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1402	0.716	1.141	0.889	0.0	100.0	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1402	0.698	1.126	0.884	0.0	100.0	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1402	0.671	1.110	0.885	0.0	99.9	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1402	0.657	1.102	0.884	0.0	99.9	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1402	0.649	1.095	0.882	0.0	100.0	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1401	0.637	1.083	0.876	0.0	99.9	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1400	0.614	1.069	0.875	0.0	100.0	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1399	0.598	1.061	0.877	0.0	99.9	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1398	0.585	1.065	0.890	0.0	99.8	0.0	0.0	0.0		

Table C23: Water temperature skill assessment metrics at Sabine Pass North, TX
Observed data time period: 3/15/2020 to 9/30/2020 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			47788	28.003									
t			47788	27.905									
T-t	3.0ºC	24 h	47788	0.098	0.668	0.661	0.0	100.0	0.0	0.0	0.0		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	742	0.120	0.636	0.625	0.0	100.0	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	741	0.088	0.631	0.626	0.0	100.0	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	740	0.064	0.645	0.642	0.0	100.0	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	739	0.041	0.651	0.650	0.0	100.0	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	738	0.019	0.645	0.645	0.0	100.0	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	737	-0.015	0.646	0.646	0.0	100.0	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	736	-0.041	0.657	0.656	0.0	100.0	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	735	-0.074	0.681	0.678	0.0	100.0	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	734	-0.084	0.683	0.678	0.0	100.0	0.0	0.0	0.0		

Table C24: Water temperature skill assessment metrics at High Island, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 1.72 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			87063	23.220									
t			87063	22.748									
T-t	3.0ºC	24 h	87063	0.472	1.195	1.098	0.0	98.7	0.0	0.0	0.8		0.99
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1395	0.471	1.209	1.114	0.0	98.9	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1394	0.452	1.202	1.114	0.0	99.0	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1394	0.430	1.202	1.123	0.0	98.8	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1395	0.408	1.202	1.131	0.0	98.8	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1396	0.383	1.200	1.137	0.0	98.8	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1395	0.362	1.198	1.143	0.0	98.6	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1394	0.337	1.197	1.149	0.0	98.6	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1393	0.317	1.197	1.155	0.0	98.5	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1392	0.301	1.203	1.165	0.0	98.6	0.0	0.0	0.0		

Table C25: Water temperature skill assessment metrics at Manchester, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			87453	24.770									
t			87453	24.143									
T-t	3.0ºC	24 h	87453	0.627	1.298	1.136	0.0	97.2	0.4	2.0	10.1		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1404	0.619	1.308	1.152	0.0	96.9	0.6	0.0	24.0		
T006-t006	3.0ºC	24 h	1404	0.603	1.312	1.165	0.0	97.0	0.6	0.0	24.0		
T012-t012	3.0ºC	24 h	1404	0.583	1.329	1.195	0.0	96.7	0.6	0.0	24.0		
T018-t018	3.0ºC	24 h	1404	0.562	1.351	1.229	0.0	96.5	0.6	0.0	24.0		
T024-t024	3.0ºC	24 h	1404	0.536	1.371	1.263	0.0	96.3	0.6	0.0	24.0		
T030-t030	3.0ºC	24 h	1403	0.514	1.395	1.298	0.0	95.7	0.6	0.0	24.0		
T036-t036	3.0ºC	24 h	1402	0.500	1.420	1.329	0.0	95.2	0.6	0.0	24.0		
T042-t042	3.0ºC	24 h	1401	0.486	1.464	1.382	0.0	94.1	0.6	0.0	24.0		
T048-t048	3.0ºC	24 h	1400	0.478	1.503	1.425	0.0	93.6	0.6	0.0	24.0		

Table C26: Water temperature skill assessment metrics at Rollover Pass, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 1.51 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			87099	22.689									
t			87099	21.458									
T-t	3.0ºC	24 h	87099	1.231	2.377	2.034	0.1	83.3	2.1	2.9	9.2		0.97
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1397	1.232	2.411	2.073	0.1	83.1	2.2	0.0	18.0		
T006-t006	3.0ºC	24 h	1397	1.211	2.401	2.074	0.1	83.0	2.2	0.0	18.0		
T012-t012	3.0ºC	24 h	1397	1.186	2.406	2.094	0.2	82.8	2.2	0.0	18.0		
T018-t018	3.0ºC	24 h	1397	1.168	2.404	2.102	0.2	82.5	2.3	0.0	18.0		
T024-t024	3.0ºC	24 h	1397	1.139	2.390	2.102	0.2	82.4	2.1	0.0	18.0		
T030-t030	3.0ºC	24 h	1396	1.107	2.382	2.110	0.2	82.7	2.3	0.0	18.0		
T036-t036	3.0ºC	24 h	1395	1.077	2.381	2.124	0.3	83.0	2.2	0.0	18.0		
T042-t042	3.0ºC	24 h	1395	1.048	2.372	2.128	0.2	82.9	2.2	0.0	18.0		
T048-t048	3.0ºC	24 h	1394	1.026	2.367	2.134	0.2	83.0	2.2	0.0	18.0		

Table C27: Water temperature skill assessment metrics at Eagle Point, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 78.90 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			68645	20.351									
t			68645	21.129									
T-t	3.0ºC	24 h	68645	-0.778	1.377	1.136	0.0	96.0	0.0	0.4	0.0		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1123	-0.786	1.393	1.151	0.0	95.9	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1124	-0.807	1.405	1.150	0.0	95.6	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1125	-0.838	1.421	1.148	0.0	95.1	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1126	-0.865	1.445	1.157	0.0	95.0	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1126	-0.892	1.457	1.152	0.0	95.1	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1125	-0.925	1.476	1.152	0.0	95.0	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1124	-0.956	1.499	1.155	0.0	94.9	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1123	-0.984	1.523	1.162	0.0	94.7	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1122	-1.011	1.546	1.170	0.0	94.1	0.0	0.0	0.0		

Table C28: Water temperature skill assessment metrics at Galveston Railroad Bridge, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			87453	22.384									
t			87453	22.894									
T-t	3.0ºC	24 h	87453	-0.510	1.328	1.226	0.0	97.4	0.0	4.1	0.0		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1404	-0.509	1.326	1.224	0.1	97.6	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1404	-0.535	1.346	1.236	0.1	97.1	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1404	-0.567	1.379	1.258	0.1	96.8	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1404	-0.598	1.407	1.273	0.1	96.4	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1404	-0.637	1.430	1.281	0.1	96.2	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1403	-0.681	1.462	1.294	0.1	95.7	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1402	-0.716	1.496	1.314	0.1	94.8	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1401	-0.754	1.537	1.340	0.1	94.4	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1400	-0.788	1.564	1.351	0.1	94.3	0.0	0.0	0.0		

Table C29: Water temperature skill assessment metrics at Galveston Bay Entrance, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 1.05 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			87206	23.416									
t			87206	22.601									
T-t	3.0ºC	24 h	87206	0.815	1.385	1.120	0.0	96.6	0.0	0.0	0.2		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1400	0.837	1.386	1.106	0.0	96.5	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1400	0.819	1.381	1.112	0.0	96.4	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1400	0.801	1.390	1.136	0.0	96.3	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1400	0.784	1.384	1.141	0.0	96.3	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1400	0.762	1.378	1.148	0.0	96.9	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1399	0.744	1.373	1.154	0.0	96.4	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1398	0.721	1.370	1.165	0.0	96.4	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1397	0.702	1.369	1.176	0.0	96.6	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1396	0.686	1.363	1.178	0.0	96.8	0.0	0.0	0.0		

Table C30: Water temperature skill assessment metrics at Freeport SPIP, TX
Observed data time period: 3/15/2020 to 10/1/2020 with gaps of 1.22 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			47795	27.445									
t			47795	29.193									
T-t	3.0ºC	24 h	47795	-1.748	2.137	1.229	0.2	83.6	0.0	5.5	0.0		0.91

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	742	-1.669	2.044	1.181	0.1	85.2	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	741	-1.694	2.071	1.192	0.1	84.3	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	740	-1.723	2.097	1.196	0.1	83.9	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	739	-1.747	2.121	1.204	0.1	85.0	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	738	-1.778	2.161	1.229	0.1	84.6	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	737	-1.807	2.191	1.240	0.4	84.1	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	736	-1.832	2.213	1.243	0.1	83.8	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	735	-1.857	2.240	1.254	0.3	83.3	0.0	6.0	0.0		
T048-t048	3.0ºC	24 h	734	-1.867	2.244	1.246	0.5	83.8	0.0	18.0	0.0		

Table C31: Water temperature skill assessment metrics at Sargent, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

| VARIABLE | X | N | IMAX | SM | RMSE | SD | NOF | CF | POF | MDNO | MDPO | WOF | SKILL |
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			87453	23.680									
t			87453	23.194									
T-t	3.0ºC	24 h	87453	0.485	2.198	2.144	0.0	81.1	0.9	0.0	19.0		0.97
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1404	0.555	2.179	2.108	0.0	81.1	1.0	0.0	18.0		
T006-t006	3.0ºC	24 h	1404	0.537	2.186	2.120	0.0	81.0	0.9	0.0	12.0		
T012-t012	3.0ºC	24 h	1404	0.514	2.196	2.136	0.0	80.8	0.9	0.0	12.0		
T018-t018	3.0ºC	24 h	1404	0.489	2.209	2.155	0.0	80.7	0.9	0.0	12.0		
T024-t024	3.0ºC	24 h	1404	0.459	2.223	2.176	0.0	80.3	0.9	0.0	18.0		
T030-t030	3.0ºC	24 h	1403	0.433	2.233	2.192	0.0	80.5	1.0	0.0	18.0		
T036-t036	3.0ºC	24 h	1402	0.412	2.239	2.202	0.0	80.3	0.9	0.0	12.0		
T042-t042	3.0ºC	24 h	1401	0.394	2.245	2.211	0.0	80.5	0.9	0.0	12.0		
T048-t048	3.0ºC	24 h	1400	0.384	2.242	2.210	0.0	81.1	0.9	0.0	12.0		

Table C32: Water temperature skill assessment metrics at Port Lavaca, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 83.51 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			67472	19.845									
t			67472	20.831									
T-t	3.0ºC	24 h	67472	-0.986	2.105	1.860	1.4	84.7	0.0	22.6	0.0		0.97

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1078	-1.040	2.138	1.869	1.3	84.1	0.0	18.0	0.0		
T006-t006	3.0ºC	24 h	1078	-1.065	2.142	1.860	1.3	84.1	0.0	18.0	0.0		
T012-t012	3.0ºC	24 h	1079	-1.084	2.145	1.852	1.2	84.2	0.0	18.0	0.0		
T018-t018	3.0ºC	24 h	1080	-1.113	2.148	1.838	1.3	83.8	0.0	18.0	0.0		
T024-t024	3.0ºC	24 h	1081	-1.155	2.157	1.823	1.2	84.2	0.0	18.0	0.0		
T030-t030	3.0ºC	24 h	1081	-1.201	2.186	1.828	1.5	83.3	0.0	36.0	0.0		
T036-t036	3.0ºC	24 h	1080	-1.238	2.221	1.844	1.5	83.4	0.0	36.0	0.0		
T042-t042	3.0ºC	24 h	1079	-1.279	2.251	1.854	1.7	82.7	0.0	36.0	0.0		
T048-t048	3.0ºC	24 h	1078	-1.310	2.278	1.864	1.6	82.1	0.0	60.0	0.0		

Table C33: Water temperature skill assessment metrics at Port O'Connor, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.25 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			87395	23.558									
t			87395	24.294									
T-t	3.0ºC	24 h	87395	-0.736	1.898	1.750	0.0	90.7	0.7	0.0	16.4		0.98

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1404	-0.714	1.906	1.767	0.0	90.6	0.8	0.0	12.0		
T006-t006	3.0ºC	24 h	1404	-0.730	1.913	1.769	0.0	90.5	0.6	0.0	12.0		
T012-t012	3.0ºC	24 h	1404	-0.748	1.927	1.777	0.0	90.5	0.8	0.0	12.0		
T018-t018	3.0ºC	24 h	1404	-0.766	1.942	1.785	0.0	90.2	0.8	0.0	18.0		
T024-t024	3.0ºC	24 h	1404	-0.794	1.959	1.791	0.0	90.2	0.9	0.0	12.0		
T030-t030	3.0ºC	24 h	1403	-0.829	1.980	1.799	0.0	90.4	0.9	0.0	18.0		
T036-t036	3.0ºC	24 h	1402	-0.859	2.011	1.819	0.0	90.2	0.9	0.0	24.0		
T042-t042	3.0ºC	24 h	1401	-0.889	2.031	1.827	0.0	89.7	1.1	0.0	18.0		
T048-t048	3.0ºC	24 h	1400	-0.916	2.048	1.832	0.0	89.5	1.2	0.0	42.0		

Table C34: Water temperature skill assessment metrics at Matagorda Bay Entr. Channel, TX
Observed data time period: 3/15/2020 to 10/16/2020 with gaps of 1.10 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			51342	27.715									
t			51342	27.098									
T-t	3.0ºC	24 h	51342	0.617	1.006	0.795	0.0	100.0	0.0	0.0	0.0		0.97

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	802	0.646	0.995	0.757	0.0	100.0	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	801	0.622	0.984	0.764	0.0	100.0	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	800	0.597	0.979	0.776	0.0	100.0	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	799	0.568	0.959	0.773	0.0	100.0	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	798	0.528	0.940	0.778	0.0	99.9	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	797	0.490	0.924	0.784	0.0	100.0	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	796	0.451	0.925	0.808	0.0	99.9	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	795	0.415	0.917	0.819	0.0	99.9	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	794	0.391	0.909	0.821	0.0	99.9	0.0	0.0	0.0		

Table C35: Water temperature skill assessment metrics at Seadrift, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			87453	21.856									
t			87453	23.658									
T-t	3.0ºC	24 h	87453	-1.802	2.410	1.600	2.3	80.2	0.0	66.3	0.2		0.97

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1404	-1.824	2.442	1.624	2.5	79.8	0.0	60.0	0.0		
T006-t006	3.0ºC	24 h	1404	-1.850	2.448	1.603	2.5	79.8	0.0	60.0	0.0		
T012-t012	3.0ºC	24 h	1404	-1.882	2.459	1.584	2.2	79.3	0.0	30.0	0.0		
T018-t018	3.0ºC	24 h	1404	-1.926	2.482	1.566	2.6	79.4	0.0	60.0	0.0		
T024-t024	3.0ºC	24 h	1404	-1.979	2.508	1.542	2.3	78.8	0.0	60.0	0.0		
T030-t030	3.0ºC	24 h	1403	-2.035	2.549	1.535	2.4	78.1	0.0	84.0	0.0		
T036-t036	3.0ºC	24 h	1402	-2.085	2.597	1.548	2.4	76.6	0.0	60.0	0.0		
T042-t042	3.0ºC	24 h	1401	-2.132	2.639	1.557	2.2	75.2	0.0	60.0	0.0		
T048-t048	3.0ºC	24 h	1400	-2.166	2.668	1.560	2.4	73.9	0.0	60.0	0.0		

Table C36: Water temperature skill assessment metrics at Rockport, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 4.16 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			53938	21.231									
t			53938	22.240									
T-t	3.0ºC	24 h	53938	-1.009	1.559	1.189	0.3	94.7	0.0	9.7	0.0		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	899	-1.015	1.569	1.197	0.2	94.1	0.0	6.0	0.0		
T006-t006	3.0ºC	24 h	900	-1.031	1.570	1.185	0.1	94.1	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	901	-1.052	1.575	1.172	0.1	94.2	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	902	-1.075	1.590	1.173	0.0	93.9	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	903	-1.100	1.609	1.175	0.2	93.7	0.0	6.0	0.0		
T030-t030	3.0ºC	24 h	903	-1.125	1.622	1.169	0.2	93.8	0.0	6.0	0.0		
T036-t036	3.0ºC	24 h	903	-1.142	1.632	1.167	0.1	93.7	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	903	-1.164	1.653	1.174	0.3	93.7	0.0	6.0	0.0		
T048-t048	3.0ºC	24 h	903	-1.181	1.670	1.181	0.4	93.4	0.0	12.0	0.0		

Table C37: Water temperature skill assessment metrics at Nueces Bay, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 12.05 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			84585	23.843									
t			84585	24.085									
T-t	3.0ºC	24 h	84585	-0.242	1.331	1.309	0.0	96.4	0.0	0.0	0.0		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1358	-0.263	1.343	1.317	0.0	96.4	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1359	-0.285	1.382	1.353	0.0	96.1	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1360	-0.303	1.439	1.408	0.0	95.2	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1361	-0.332	1.487	1.450	0.0	94.6	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1360	-0.351	1.540	1.500	0.0	93.8	0.1	0.0	0.0		
T030-t030	3.0ºC	24 h	1358	-0.364	1.602	1.561	0.0	92.6	0.1	0.0	6.0		
T036-t036	3.0ºC	24 h	1356	-0.379	1.671	1.628	0.0	92.3	0.3	0.0	12.0		
T042-t042	3.0ºC	24 h	1354	-0.398	1.736	1.691	0.0	90.6	0.2	0.0	6.0		
T048-t048	3.0ºC	24 h	1353	-0.413	1.778	1.730	0.0	90.8	0.3	0.0	12.0		

Table C38: Water temperature skill assessment metrics at Lexington CC Bay, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 1.56 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			87083	23.748									
t			87083	23.872									
T-t	3.0ºC	24 h	87083	-0.124	1.100	1.093	0.0	98.7	0.0	0.0	0.0		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1401	-0.130	1.109	1.101	0.0	98.7	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1400	-0.145	1.109	1.099	0.0	98.7	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1399	-0.167	1.114	1.102	0.0	98.8	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1398	-0.191	1.124	1.108	0.0	98.9	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1399	-0.212	1.122	1.102	0.0	98.8	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1399	-0.234	1.128	1.104	0.0	98.6	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1399	-0.264	1.146	1.115	0.0	98.5	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1399	-0.294	1.160	1.123	0.0	98.5	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1397	-0.314	1.170	1.127	0.0	98.3	0.0	0.0	0.0		

Table C39: Water temperature skill assessment metrics at Aransas Pass, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 190.87 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			41708	20.476									
t			41708	19.908									
T-t	3.0ºC	24 h	41708	0.568	1.316	1.187	0.0	95.9	0.2	0.0	2.2		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	657	0.612	1.330	1.182	0.0	95.4	0.2	0.0	0.0		
T006-t006	3.0ºC	24 h	657	0.597	1.328	1.187	0.0	95.3	0.2	0.0	0.0		
T012-t012	3.0ºC	24 h	657	0.577	1.330	1.199	0.0	95.6	0.2	0.0	0.0		
T018-t018	3.0ºC	24 h	657	0.554	1.328	1.208	0.0	95.4	0.2	0.0	0.0		
T024-t024	3.0ºC	24 h	657	0.533	1.331	1.220	0.0	95.3	0.3	0.0	6.0		
T030-t030	3.0ºC	24 h	656	0.516	1.327	1.224	0.0	95.6	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	655	0.493	1.332	1.239	0.0	95.4	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	654	0.473	1.349	1.264	0.0	95.6	0.3	0.0	6.0		
T048-t048	3.0ºC	24 h	653	0.452	1.351	1.274	0.0	95.6	0.2	0.0	0.0		

Table C40: Water temperature skill assessment metrics at Packery Channel, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 5.17 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			86670	23.100									
t			86670	23.768									
T-t	3.0ºC	24 h	86670	-0.667	1.621	1.477	0.0	93.7	0.0	1.0	0.0		0.98
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1386	-0.655	1.632	1.495	0.1	93.2	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1385	-0.671	1.635	1.492	0.1	93.0	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1384	-0.688	1.655	1.506	0.1	93.3	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1383	-0.717	1.682	1.522	0.0	93.1	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1383	-0.755	1.700	1.524	0.1	92.3	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1382	-0.792	1.720	1.527	0.1	92.4	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1381	-0.822	1.746	1.541	0.1	92.0	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1380	-0.855	1.785	1.567	0.1	91.7	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1379	-0.888	1.816	1.584	0.1	91.1	0.0	0.0	0.0		

Table C41: Water temperature skill assessment metrics at Baffin Bay, TX
Observed data time period: 3/15/2020 to 6/30/2020 with gaps of 0.22 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE CRITERION	X -	N -	IMAX -	SM -	RMSE -	SD -	NOF <1%	CF >90%	POF <1%	MDNO <N	MDPO <N	WOF <.5%	SKILL
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			87403	22.865									
t			87403	24.999									
T-t	3.0ºC	24 h	87403	-2.135	2.625	1.528	1.3	73.0	0.0	11.9	0.0		0.96
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1404	-2.131	2.643	1.564	1.4	72.6	0.0	6.0	0.0		
T006-t006	3.0ºC	24 h	1404	-2.138	2.652	1.569	1.4	72.1	0.0	6.0	0.0		
T012-t012	3.0ºC	24 h	1404	-2.150	2.668	1.580	1.1	71.7	0.0	6.0	0.0		
T018-t018	3.0ºC	24 h	1404	-2.169	2.677	1.570	1.3	71.4	0.0	6.0	0.0		
T024-t024	3.0ºC	24 h	1404	-2.197	2.682	1.538	0.8	71.8	0.0	6.0	0.0		
T030-t030	3.0ºC	24 h	1403	-2.229	2.708	1.539	1.1	70.4	0.0	6.0	0.0		
T036-t036	3.0ºC	24 h	1402	-2.261	2.752	1.569	1.1	69.1	0.0	6.0	0.0		
T042-t042	3.0ºC	24 h	1401	-2.294	2.784	1.578	1.1	68.5	0.0	6.0	0.0		
T048-t048	3.0ºC	24 h	1400	-2.320	2.800	1.568	1.0	68.8	0.0	12.0	0.0		

Table C42: Water temperature skill assessment metrics at Rincon del San Jose, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.96 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			87226	22.862									
t			87226	24.850									
T-t	3.0ºC	24 h	87226	-1.988	2.477	1.477	1.3	79.6	0.0	61.1	3.1		0.96

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1400	-2.002	2.499	1.497	1.3	78.9	0.1	54.0	0.0		
T006-t006	3.0ºC	24 h	1400	-1.991	2.496	1.507	1.3	79.1	0.1	54.0	0.0		
T012-t012	3.0ºC	24 h	1400	-1.993	2.508	1.523	1.4	80.0	0.1	60.0	0.0		
T018-t018	3.0ºC	24 h	1400	-2.016	2.526	1.523	1.4	78.7	0.1	60.0	0.0		
T024-t024	3.0ºC	24 h	1400	-2.051	2.551	1.517	1.2	78.1	0.1	60.0	0.0		
T030-t030	3.0ºC	24 h	1399	-2.084	2.577	1.517	1.3	77.9	0.1	60.0	0.0		
T036-t036	3.0ºC	24 h	1398	-2.114	2.611	1.532	1.2	76.2	0.1	54.0	0.0		
T042-t042	3.0ºC	24 h	1397	-2.146	2.645	1.548	1.2	75.4	0.1	54.0	0.0		
T048-t048	3.0ºC	24 h	1396	-2.170	2.675	1.564	1.2	74.4	0.1	54.0	0.0		

Table C43: Water temperature skill assessment metrics at Port Mansfield, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 1.13 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE CRITERION	X -	N -	IMAX -	SM -	RMSE -	SD -	NOF <1%	CF >90%	POF <1%	MDNO <N	MDPO <N	WOF <.5%	SKILL
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			87183	23.025									
t			87183	25.072									
T-t	3.0ºC	24 h	87183	-2.047	2.258	0.951	0.0	85.5	0.0	0.0	0.0		0.96
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1400	-2.056	2.263	0.946	0.0	85.6	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1400	-2.044	2.251	0.944	0.0	85.7	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1400	-2.044	2.256	0.956	0.0	85.2	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1400	-2.067	2.285	0.974	0.0	84.7	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1400	-2.103	2.326	0.994	0.0	84.2	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1399	-2.140	2.364	1.005	0.1	82.5	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1398	-2.168	2.398	1.025	0.1	81.9	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1397	-2.196	2.437	1.058	0.1	80.5	0.0	6.0	0.0		
T048-t048	3.0ºC	24 h	1396	-2.216	2.464	1.078	0.1	78.7	0.0	0.0	0.0		

Table C44: Water temperature skill assessment metrics at Realitos Peninsula, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 11.24 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			84820	23.239									
t			84820	24.540									
T-t	3.0ºC	24 h	84820	-1.301	2.176	1.744	0.6	83.8	0.3	6.7	11.5		0.96
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1364	-1.281	2.196	1.784	0.8	84.0	0.3	0.0	6.0		
T006-t006	3.0ºC	24 h	1364	-1.273	2.211	1.808	0.8	83.6	0.4	0.0	6.0		
T012-t012	3.0ºC	24 h	1364	-1.283	2.242	1.839	0.8	82.3	0.4	0.0	6.0		
T018-t018	3.0ºC	24 h	1364	-1.313	2.249	1.827	0.7	82.1	0.3	0.0	0.0		
T024-t024	3.0ºC	24 h	1363	-1.349	2.261	1.815	0.7	82.8	0.3	0.0	6.0		
T030-t030	3.0ºC	24 h	1361	-1.390	2.291	1.823	0.7	82.0	0.3	0.0	0.0		
T036-t036	3.0ºC	24 h	1359	-1.425	2.342	1.859	0.7	80.1	0.3	0.0	0.0		
T042-t042	3.0ºC	24 h	1357	-1.456	2.375	1.877	0.6	79.6	0.3	0.0	0.0		
T048-t048	3.0ºC	24 h	1356	-1.472	2.389	1.882	0.7	79.2	0.4	0.0	6.0		

Table C45: Water temperature skill assessment metrics at Port Isabel, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 0.71 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			87287	23.477									
t			87287	24.341									
T-t	3.0ºC	24 h	87287	-0.864	2.039	1.847	0.0	84.1	0.0	0.0	0.0		0.96

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1401	-0.818	2.035	1.864	0.0	84.2	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1401	-0.828	2.042	1.867	0.0	83.9	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1401	-0.822	2.047	1.875	0.0	83.8	0.1	0.0	0.0		
T018-t018	3.0ºC	24 h	1401	-0.835	2.063	1.887	0.0	83.5	0.1	0.0	0.0		
T024-t024	3.0ºC	24 h	1401	-0.861	2.072	1.885	0.0	82.7	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1400	-0.900	2.093	1.891	0.0	82.7	0.1	0.0	0.0		
T036-t036	3.0ºC	24 h	1399	-0.907	2.106	1.901	0.0	82.6	0.1	0.0	6.0		
T042-t042	3.0ºC	24 h	1399	-0.927	2.126	1.914	0.0	81.9	0.2	0.0	12.0		
T048-t048	3.0ºC	24 h	1399	-0.934	2.138	1.924	0.0	81.6	0.2	0.0	12.0		

Table C46: Water temperature skill assessment metrics at Brazos Santiago, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 1.03 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			87267	23.828									
t			87267	23.611									
T-t	3.0ºC	24 h	87267	0.217	1.421	1.404	0.0	95.7	0.1	0.0	4.4		0.98

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1403	0.244	1.433	1.413	0.0	95.3	0.1	0.0	0.0		
T006-t006	3.0ºC	24 h	1402	0.232	1.455	1.436	0.0	95.0	0.1	0.0	0.0		
T012-t012	3.0ºC	24 h	1401	0.236	1.480	1.461	0.0	94.6	0.1	0.0	0.0		
T018-t018	3.0ºC	24 h	1400	0.230	1.489	1.471	0.0	94.6	0.2	0.0	0.0		
T024-t024	3.0ºC	24 h	1400	0.211	1.495	1.481	0.0	94.7	0.3	0.0	12.0		
T030-t030	3.0ºC	24 h	1399	0.183	1.503	1.492	0.0	94.6	0.2	0.0	6.0		
T036-t036	3.0ºC	24 h	1398	0.174	1.514	1.504	0.0	94.8	0.1	0.0	0.0		
T042-t042	3.0ºC	24 h	1397	0.166	1.529	1.521	0.0	94.5	0.4	0.0	12.0		
T048-t048	3.0ºC	24 h	1396	0.158	1.539	1.532	0.0	94.7	0.4	0.0	12.0		

Table C47: Water temperature skill assessment metrics at 50 NM of Corpus Christi, TX
Observed data time period: 3/15/2020 to 5/11/2020 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE CRITERION	X -	N -	IMAX -	SM -	RMSE -	SD -	NOF <1%	CF >90%	POF <1%	MDNO <N	MDPO <N	WOF <.5%	SKILL
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			13756	23.769									
t			13756	23.642									
T-t	3.0ºC	24 h	13756	0.127	0.897	0.888	0.0	100.0	0.0	0.0	0.0		0.92
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	209	0.184	0.893	0.876	0.0	100.0	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	208	0.153	0.894	0.883	0.0	100.0	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	207	0.110	0.908	0.904	0.0	100.0	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	206	0.072	0.922	0.921	0.0	100.0	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	205	0.044	0.929	0.930	0.0	100.0	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	204	0.022	0.942	0.944	0.0	100.0	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	203	-0.002	0.967	0.970	0.0	100.0	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	202	-0.037	0.987	0.989	0.0	100.0	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	201	-0.063	0.993	0.993	0.0	100.0	0.0	0.0	0.0		

Table C48: Water temperature skill assessment metrics at 22 NM of Galveston Bay, TX
Observed data time period: 3/28/2020 to 3/17/2021 with gaps of 7.79 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			82618	24.071									
t			82618	23.244									
T-t	3.0ºC	24 h	82618	0.827	1.047	0.642	0.0	100.0	0.0	0.0	0.0		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1334	0.828	1.057	0.658	0.0	99.9	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1335	0.809	1.045	0.663	0.0	99.9	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1336	0.786	1.033	0.669	0.0	99.9	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1337	0.772	1.026	0.676	0.0	99.9	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1339	0.754	1.013	0.677	0.0	99.9	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1339	0.735	1.003	0.682	0.0	99.9	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1339	0.717	0.997	0.693	0.0	99.9	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1339	0.699	0.987	0.697	0.0	99.9	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1338	0.690	0.987	0.705	0.0	100.0	0.0	0.0	0.0		

Table C49: Water temperature skill assessment metrics at 60 NM S of Freeport, TX
Observed data time period: 3/29/2020 to 3/17/2021 with gaps of 7.80 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			82367	25.835									
t			82367	25.736									
T-t	3.0ºC	24 h	82367	0.100	0.479	0.468	0.0	99.9	0.0	0.0	0.0		0.99
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1330	0.101	0.495	0.485	0.0	99.8	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1331	0.087	0.498	0.491	0.0	99.8	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1332	0.070	0.503	0.498	0.0	99.8	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1333	0.060	0.507	0.504	0.0	99.8	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1335	0.050	0.508	0.506	0.0	99.9	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1335	0.042	0.512	0.510	0.0	99.9	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1335	0.034	0.517	0.517	0.0	99.8	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1335	0.027	0.516	0.516	0.0	99.8	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1334	0.024	0.520	0.520	0.0	99.8	0.0	0.0	0.0		

Table C50: Water temperature skill assessment metrics at Bon Secour, AL
Observed data time period: 4/3/2020 to 3/9/2021 with gaps of 17.38 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			77340	23.132									
t			77340	22.332									
T-t	3.0ºC	24 h	77340	0.800	1.236	0.943	0.0	98.5	0.0	0.0	0.0		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1255	0.795	1.235	0.946	0.0	98.5	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1253	0.780	1.222	0.941	0.0	98.5	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1253	0.761	1.207	0.937	0.0	98.6	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1253	0.746	1.203	0.944	0.0	98.5	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1253	0.724	1.197	0.954	0.0	98.6	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1253	0.697	1.189	0.964	0.0	98.8	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1253	0.669	1.181	0.973	0.0	98.7	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1253	0.655	1.192	0.997	0.0	98.6	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1253	0.633	1.194	1.013	0.0	98.5	0.0	0.0	0.0		

Table C51: Water temperature skill assessment metrics at Cedar Point, AL
Observed data time period: 3/15/2020 to 8/31/2020 with gaps of 16.30 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			36771	26.788									
t			36771	26.152									
T-t	3.0ºC	24 h	36771	0.636	1.079	0.872	0.0	100.0	0.0	0.0	0.0		0.98

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	565	0.648	1.054	0.832	0.0	100.0	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	563	0.611	1.039	0.841	0.0	100.0	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	562	0.570	1.030	0.858	0.0	100.0	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	561	0.526	1.018	0.872	0.0	100.0	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	560	0.485	1.007	0.883	0.0	100.0	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	559	0.434	0.990	0.891	0.0	100.0	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	558	0.385	0.996	0.919	0.0	99.8	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	557	0.371	1.012	0.942	0.0	100.0	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	556	0.331	1.026	0.972	0.0	99.8	0.0	0.0	0.0		

Table C52: Water temperature skill assessment metrics at Dauphin Island, AL
Observed data time period: 3/15/2020 to 2/28/2021 with gaps of 74.10 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

| VARIABLE | X | N | IMAX | SM | RMSE | SD | NOF | CF | POF | MDNO | MDPO | WOF | SKILL |
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			66364	23.210									
t			66364	22.560									
T-t	3.0ºC	24 h	66364	0.651	1.212	1.023	0.0	99.2	0.0	0.0	0.0		0.99
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	1056	0.649	1.235	1.052	0.0	99.0	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1054	0.642	1.235	1.055	0.0	99.1	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1053	0.624	1.248	1.081	0.0	98.9	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1052	0.609	1.248	1.089	0.0	98.7	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1051	0.593	1.243	1.093	0.0	98.4	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1050	0.575	1.253	1.114	0.0	98.2	0.2	0.0	0.0		
T036-t036	3.0ºC	24 h	1049	0.554	1.276	1.150	0.0	98.1	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1048	0.541	1.283	1.164	0.0	97.8	0.1	0.0	0.0		
T048-t048	3.0ºC	24 h	1047	0.514	1.291	1.186	0.0	98.0	0.0	0.0	0.0		

Table C53: Water temperature skill assessment metrics at Port Aransas, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 9.38 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			85503	24.225									
t			85503	23.544									
T-t	3.0ºC	24 h	85503	0.681	1.274	1.077	0.0	98.5	0.0	0.0	0.0		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1367	0.697	1.288	1.083	0.0	98.4	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1367	0.681	1.286	1.091	0.0	98.5	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1367	0.665	1.298	1.115	0.0	98.5	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1367	0.637	1.297	1.130	0.0	98.3	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1367	0.613	1.299	1.145	0.0	98.5	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1366	0.585	1.296	1.157	0.0	98.2	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1365	0.565	1.297	1.168	0.0	98.4	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1364	0.538	1.301	1.185	0.0	98.2	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1363	0.518	1.292	1.184	0.0	98.2	0.0	0.0	0.0		

Table C54: Water temperature skill assessment metrics at Calcasieu Lake, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 106.16 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
T			61932	25.358									
t			61932	24.807									
T-t	3.0ºC	24 h	61932	0.551	1.601	1.504	0.4	94.5	0.0	24.4	0.0		0.98
SCENARIO: SEMI-OPERATIONAL FORECAST													
T000-t000	3.0ºC	24 h	984	0.566	1.592	1.489	0.4	94.8	0.0	18.0	0.0		
T006-t006	3.0ºC	24 h	984	0.554	1.584	1.485	0.4	95.1	0.0	18.0	0.0		
T012-t012	3.0ºC	24 h	984	0.530	1.580	1.489	0.4	95.1	0.0	18.0	0.0		
T018-t018	3.0ºC	24 h	984	0.507	1.587	1.504	0.5	94.5	0.0	18.0	0.0		
T024-t024	3.0ºC	24 h	984	0.483	1.595	1.521	0.5	94.6	0.0	18.0	0.0		
T030-t030	3.0ºC	24 h	983	0.457	1.600	1.534	0.5	94.0	0.0	18.0	0.0		
T036-t036	3.0ºC	24 h	982	0.435	1.606	1.547	0.5	93.8	0.0	18.0	0.0		
T042-t042	3.0ºC	24 h	981	0.421	1.616	1.561	0.5	93.7	0.0	18.0	0.0		
T048-t048	3.0ºC	24 h	980	0.407	1.619	1.568	0.6	93.7	0.0	18.0	0.0		

Table C55: Water temperature skill assessment metrics at USGS Calcasieu River, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 13.33 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			84212	23.220									
t			84212	21.822									
T-t	3.0ºC	24 h	84212	1.398	1.707	0.980	0.0	95.4	0.0	0.0	0.0		0.98

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1350	1.409	1.712	0.973	0.0	95.2	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1350	1.403	1.721	0.998	0.0	94.7	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1350	1.382	1.737	1.052	0.0	94.4	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1350	1.373	1.769	1.115	0.0	93.7	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1350	1.365	1.803	1.178	0.0	93.3	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1349	1.353	1.828	1.229	0.0	92.7	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1348	1.349	1.866	1.290	0.0	91.5	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1347	1.347	1.905	1.348	0.0	91.1	0.1	0.0	0.0		
T048-t048	3.0ºC	24 h	1346	1.343	1.946	1.409	0.0	91.0	0.3	0.0	6.0		

Table C56: Water temperature skill assessment metrics at Cameron, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 56.48 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T			73849	21.944									
t			73849	21.531									
T-t	3.0ºC	24 h	73849	0.413	1.137	1.059	0.0	98.8	0.0	0.0	0.0		0.99

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
T000-t000	3.0ºC	24 h	1179	0.411	1.140	1.064	0.0	98.8	0.0	0.0	0.0		
T006-t006	3.0ºC	24 h	1179	0.400	1.133	1.061	0.0	98.9	0.0	0.0	0.0		
T012-t012	3.0ºC	24 h	1179	0.394	1.145	1.075	0.0	98.6	0.0	0.0	0.0		
T018-t018	3.0ºC	24 h	1179	0.386	1.144	1.077	0.0	98.6	0.0	0.0	0.0		
T024-t024	3.0ºC	24 h	1179	0.359	1.138	1.080	0.0	98.8	0.0	0.0	0.0		
T030-t030	3.0ºC	24 h	1178	0.343	1.146	1.094	0.0	98.7	0.0	0.0	0.0		
T036-t036	3.0ºC	24 h	1177	0.334	1.152	1.103	0.0	98.7	0.0	0.0	0.0		
T042-t042	3.0ºC	24 h	1176	0.316	1.161	1.118	0.0	99.0	0.0	0.0	0.0		
T048-t048	3.0ºC	24 h	1175	0.299	1.168	1.129	0.0	98.7	0.0	0.0	0.0		

APPENDIX D: TIME SERIES OF MODELED WATER TEMPERATUREVERSUS OBSERVATIONS
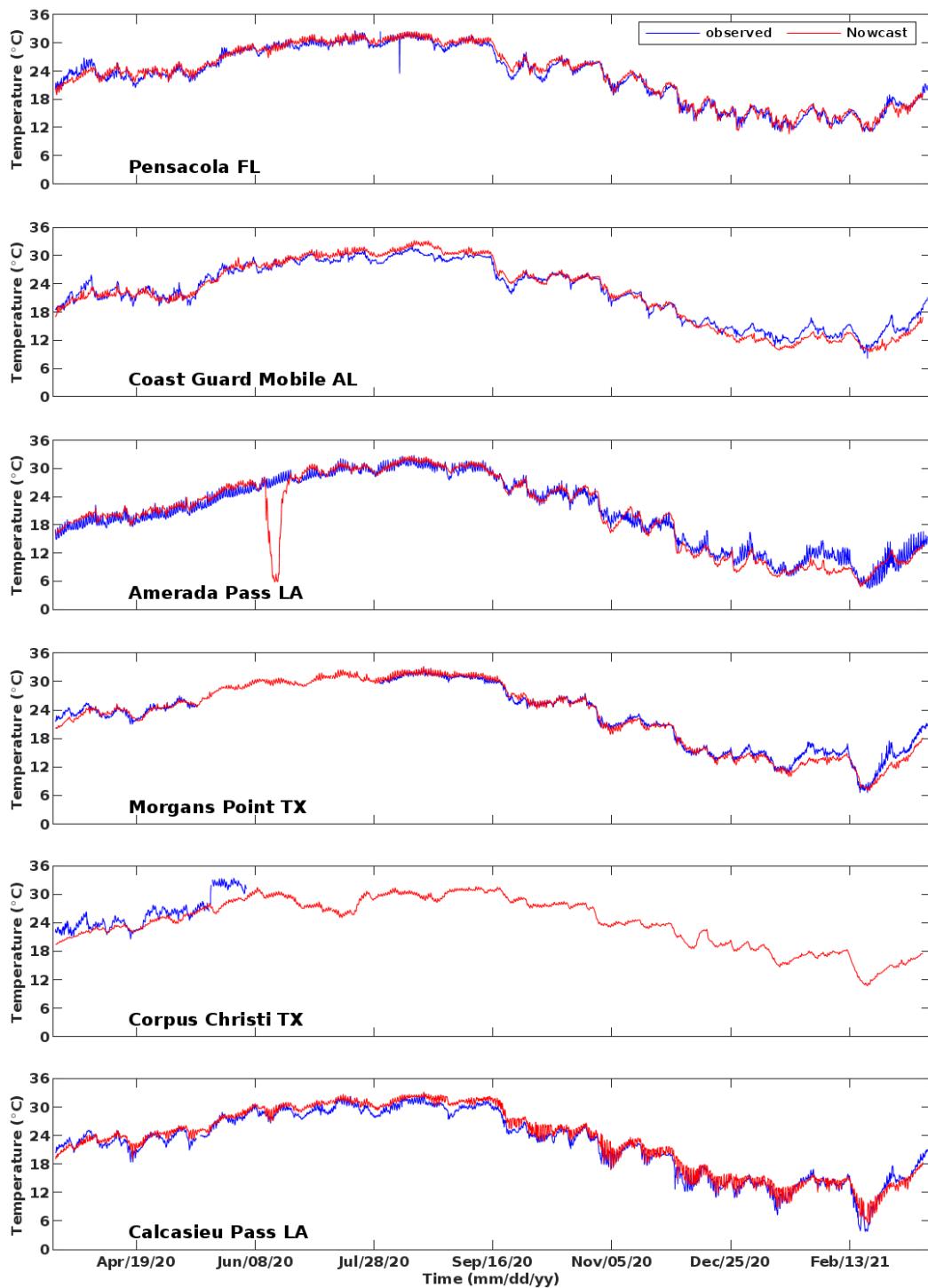
Figure D-1. Time series of modeled (red) versus observed (blue) water temperatures at stations (from upper to lower): Pensacola, FL; Coast Guard Mobile Sector, AL; Amerada Pass, LA; Morgans Point, TX; Corpus Christi, TX; and Calcasieu Pass, LA.
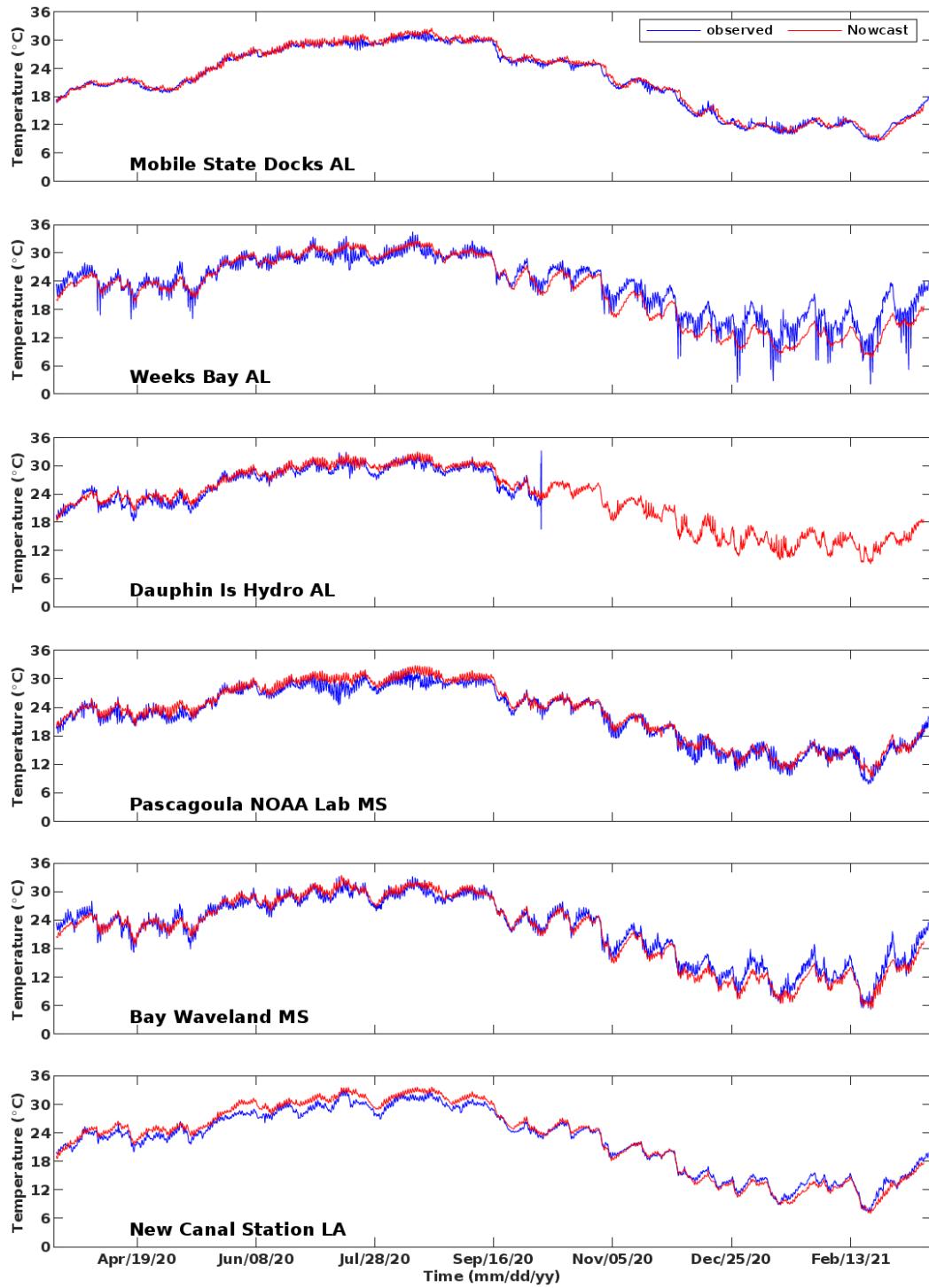
Figure D-2. Time series of modeled (red) versus observed (blue) water temperatures at stations (from upper to lower): Mobile State Docks, AL; Weeks Bay, AL; Dauphin Island Hydro, AL; Pascagoula NOAA Lab, MS; Bay Waveland, MS; and New Canal Station, LA.
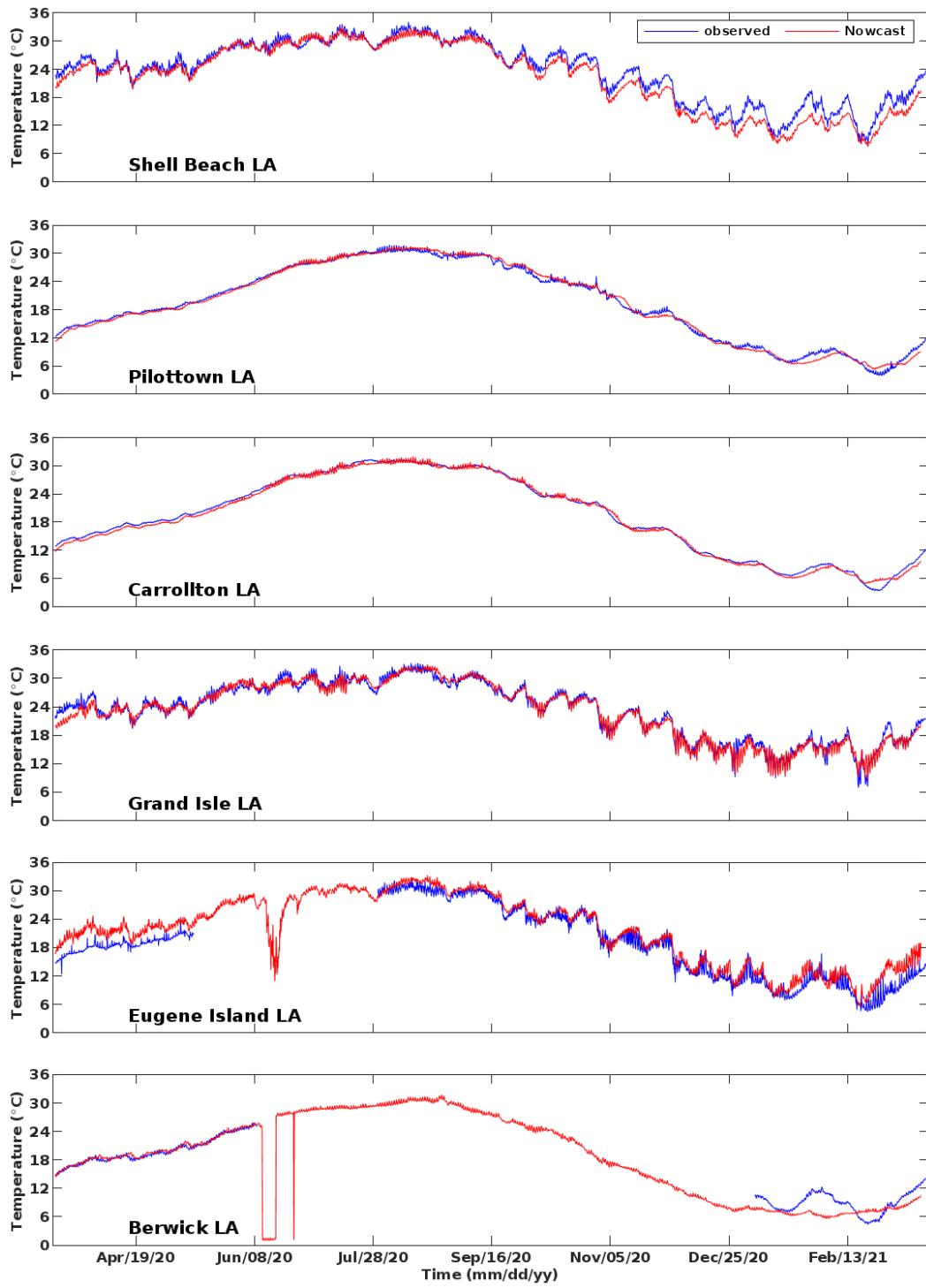
Figure D-3. Time series of modeled (red) versus observed (blue) water temperatures at stations (from upper to lower): Shell Beach, LA; Pilottown, LA; Carrollton, LA; Grand Isle, LA; Eugene Island, LA; and Berwick, LA.

D-3
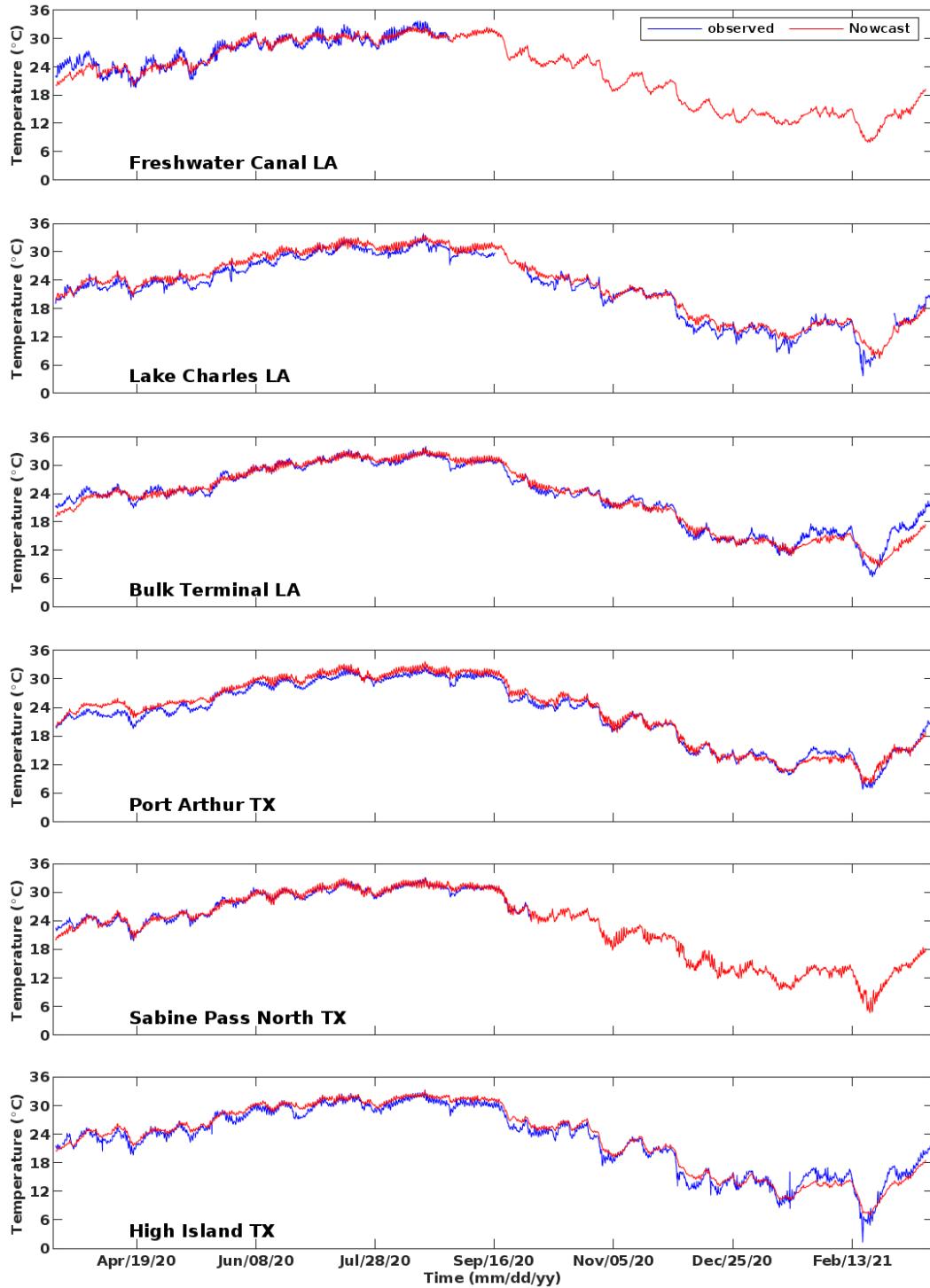
Figure D-4. Time series of modeled (red) versus observed (blue) water temperatures at stations (from upper to lower): Freshwater Canal, LA; Lake Charles, LA; Bulk Terminal, LA; Port Arthur, TX; Sabine Pass North, TX; and High Island, TX.
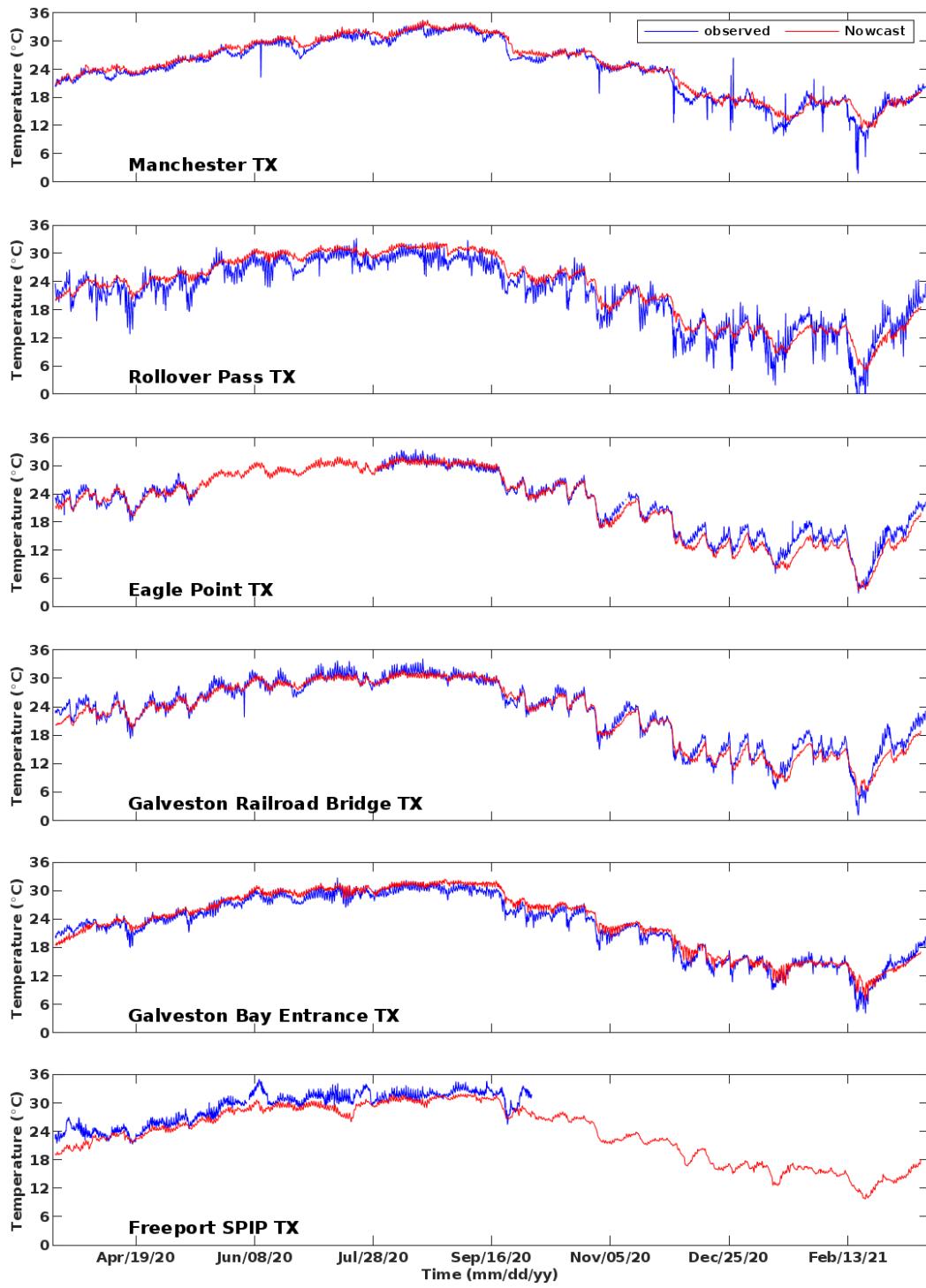
Figure D-5. Time series of modeled (red) versus observed (blue) water temperatures at stations (from upper to lower): Manchester, TX; Rollover Pass, TX; Eagle Point, TX; Galveston Railroad Bridge, TX; Galveston Bay Entrance, TX; and Freeport SPIP, TX.

D-5
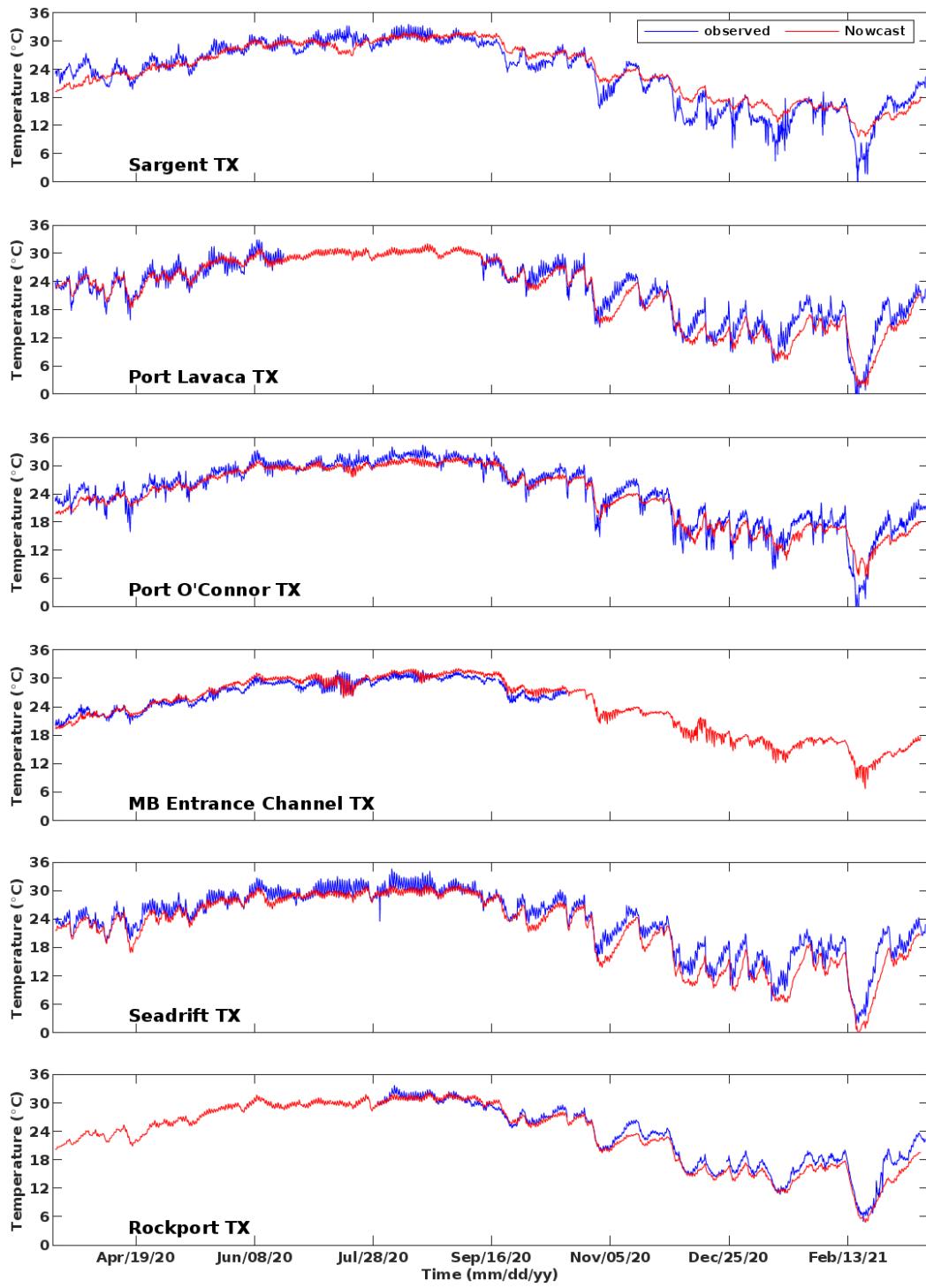
Figure D-6. Time series of modeled (red) versus observed (blue) water temperatures at stations (from upper to lower): Sargent, TX; Port Lavaca, TX; Port O'Connor, TX; Matagorda Bay Entrance Channel, TX; Seadrift, TX; and Rockport, TX.
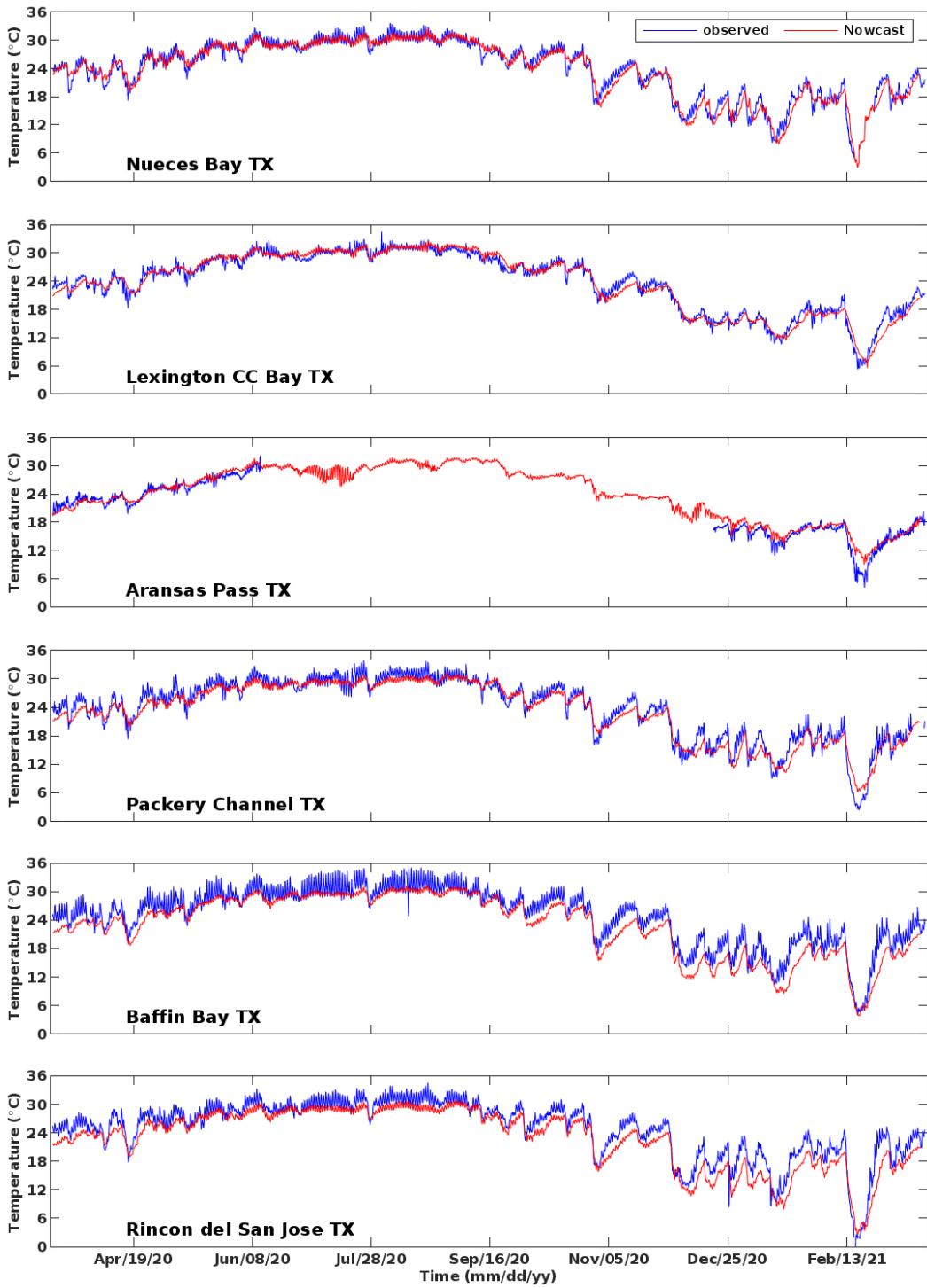
Figure D-7. Time series of modeled (red) versus observed (blue) water temperatures at stations (from upper to lower): Nueces Bay, TX; Lexington Corpus Christi Bay, TX; Aransas Pass, TX; Pockery Channel, TX; Baffin Bay, TX; and Rincon del San Jose, TX.
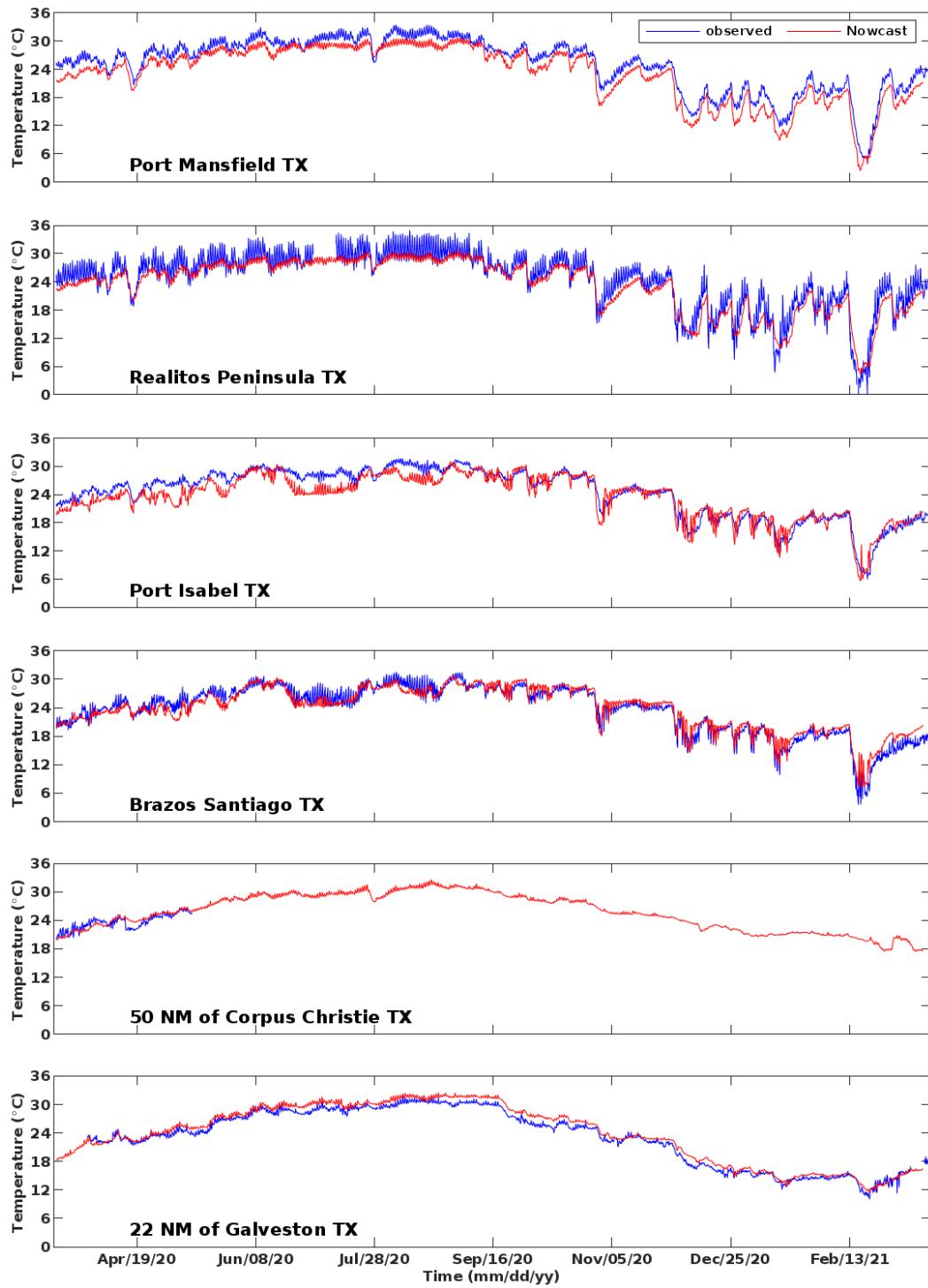
Figure D-8. Time series of modeled (red) versus observed (blue) water temperatures at stations (from upper to lower): Port Mansfield, TX; Realitos Peninsula, TX; Port Isabel, TX; Brazos Santiago, TX; 50 NM of Corpus Christi, TX; and 220 NM of Galveston, TX.
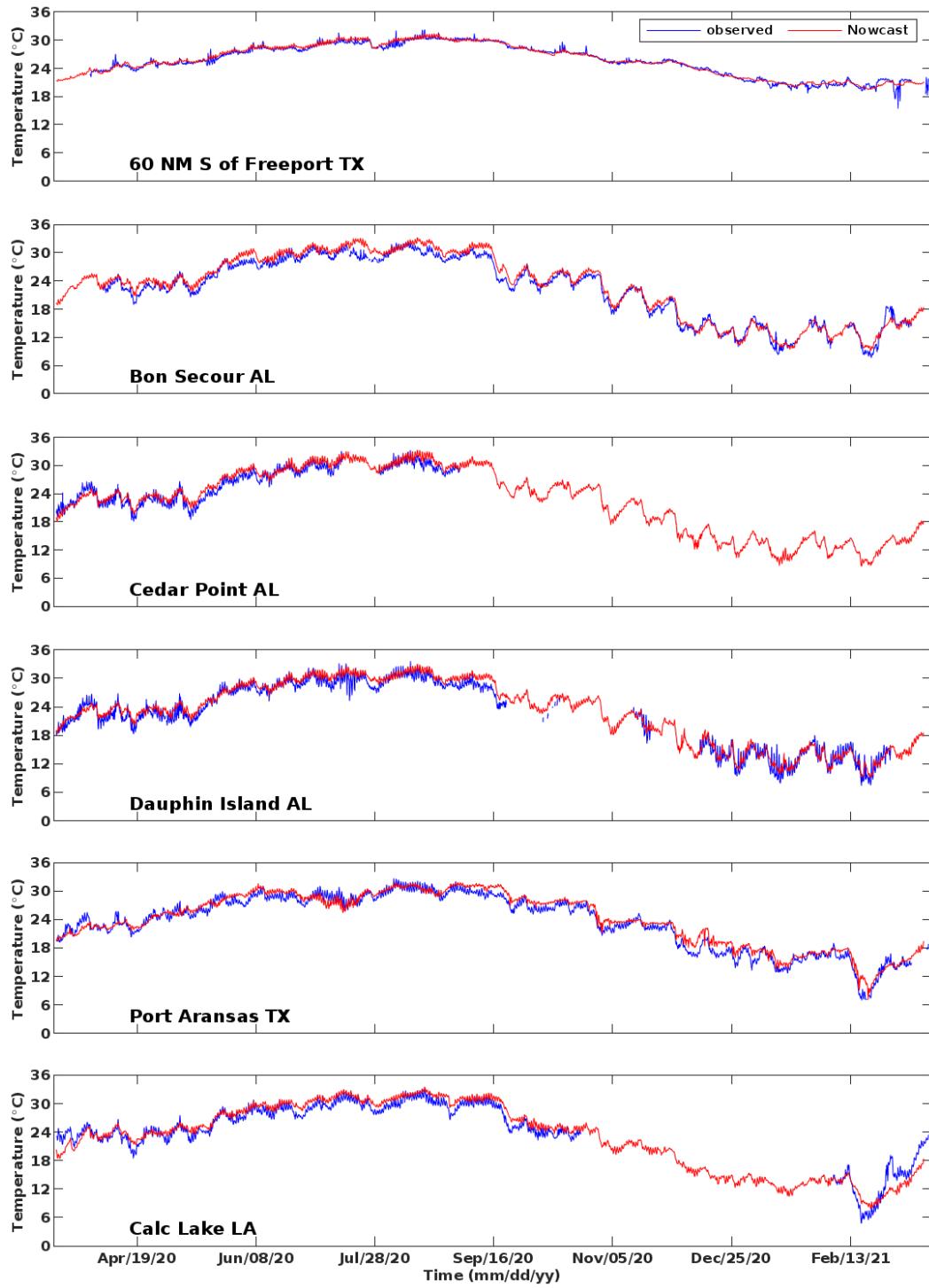
Figure D-9. Time series of modeled (red) versus observed (blue) water temperatures at stations (from upper to lower): 60 NM of Freeport, TX; Bon Secour, AL; Cedar Point, AL; Dauphin Island, AL; Port Aransas, TX; and Calcasieu Lake, LA.
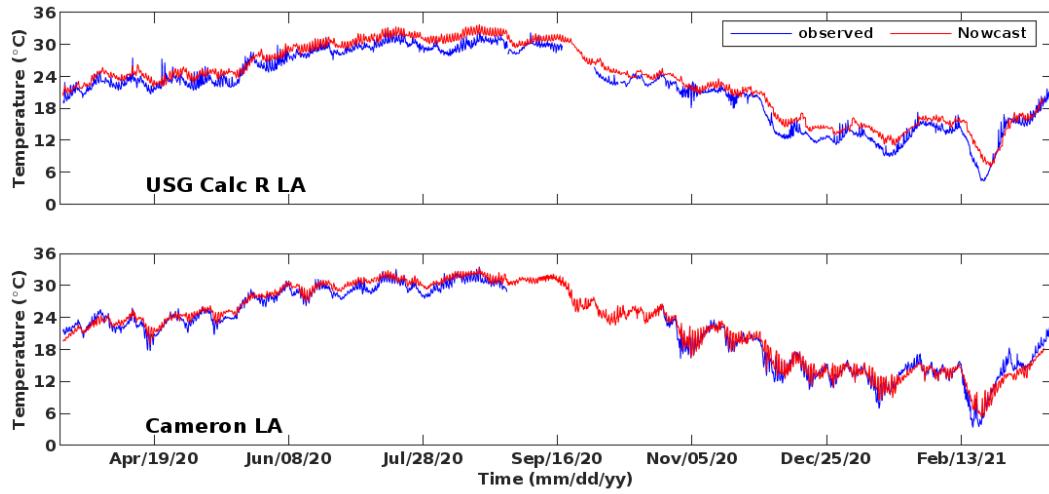
Figure D-10. Time series of modeled (red) versus observed (blue) water temperature at stations USGS Calcasieu River, LA (upper panel) and Cameron, LA (lower panel).

APPENDIX E: WATER SALINITY SKILL ASSESSMENT METRICS TABLES

Table E1: Water salinity skill assessment metrics at Morgans Point, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 76.72 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
S			69163	12.154									
s			69163	12.579									
S-s	3.5	24 h	69163	-0.425	3.165	3.136	3.3	73.6	0.5	35.6	12.5		0.82
SCENARIO: SEMI-OPERATIONAL FORECAST													
S000-s000	3.5	24 h	1130	-0.434	3.177	3.149	3.5	73.5	0.5	60.0	12.0		
S006-s006	3.5	24 h	1131	-0.404	3.168	3.143	3.0	73.2	0.5	24.0	12.0		
S012-s012	3.5	24 h	1132	-0.395	3.152	3.129	3.0	73.3	0.4	60.0	6.0		
S018-s018	3.5	24 h	1133	-0.406	3.177	3.152	3.4	73.0	0.3	36.0	6.0		
S024-s024	3.5	24 h	1133	-0.407	3.174	3.149	3.3	72.8	0.3	30.0	0.0		
S030-s030	3.5	24 h	1132	-0.409	3.176	3.151	3.3	73.3	0.4	48.0	6.0		
S036-s036	3.5	24 h	1131	-0.412	3.183	3.158	3.7	73.0	0.5	30.0	12.0		
S042-s042	3.5	24 h	1130	-0.417	3.187	3.161	3.5	73.1	0.7	30.0	12.0		
S048-s048	3.5	24 h	1129	-0.414	3.181	3.155	3.1	73.1	0.6	30.0	12.0		

Table E2: Water salinity skill assessment metrics at Eagle Point, TX
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 78.90 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
S			68645	12.384									
s			68645	9.044									
S-s	3.5	24 h	68645	3.340	5.102	3.857	0.0	29.3	12.7	0.0	120.3		0.58

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
S000-s000	3.5	24 h	1123	3.435	5.128	3.809	0.0	28.9	13.0	0.0	120.0		
S006-s006	3.5	24 h	1124	3.439	5.133	3.812	0.0	28.7	13.2	0.0	120.0		
S012-s012	3.5	24 h	1125	3.446	5.143	3.820	0.0	29.0	13.3	0.0	120.0		
S018-s018	3.5	24 h	1126	3.446	5.146	3.824	0.0	28.5	13.2	0.0	120.0		
S024-s024	3.5	24 h	1126	3.446	5.142	3.818	0.0	28.7	13.3	0.0	108.0		
S030-s030	3.5	24 h	1125	3.450	5.143	3.816	0.0	28.4	13.6	0.0	114.0		
S036-s036	3.5	24 h	1124	3.457	5.148	3.817	0.0	28.5	13.8	0.0	126.0		
S042-s042	3.5	24 h	1123	3.455	5.143	3.811	0.0	28.6	13.4	0.0	126.0		
S048-s048	3.5	24 h	1122	3.460	5.141	3.803	0.0	29.5	13.5	0.0	126.0		

Table E3: Water salinity skill assessment metrics at Bon Secour, AL
Observed data time period: 4/3/2020 to 3/9/2021 with gaps of 14.62 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
S			77987	15.671									
s			77987	14.316									
S-s	3.5	24 h	77987	1.355	5.838	5.678	2.6	58.9	13.5	44.5	807.3		0.74

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
S000-s000	3.5	24 h	1261	1.418	5.868	5.697	2.2	59.1	13.8	42.0	912.0		
S006-s006	3.5	24 h	1259	1.436	5.878	5.703	2.2	59.0	13.9	42.0	912.0		
S012-s012	3.5	24 h	1259	1.442	5.869	5.692	2.2	59.1	13.8	42.0	912.0		
S018-s018	3.5	24 h	1259	1.436	5.874	5.698	2.5	59.0	13.7	42.0	912.0		
S024-s024	3.5	24 h	1259	1.436	5.883	5.708	2.4	58.9	13.6	42.0	912.0		
S030-s030	3.5	24 h	1259	1.433	5.882	5.707	2.3	58.5	13.8	42.0	912.0		
S036-s036	3.5	24 h	1259	1.423	5.884	5.711	2.4	58.6	13.7	42.0	906.0		
S042-s042	3.5	24 h	1259	1.417	5.898	5.728	2.4	58.9	13.7	42.0	462.0		
S048-s048	3.5	24 h	1259	1.404	5.903	5.736	2.5	58.9	13.7	42.0	474.0		

E-3

Table E4: Water salinity skill assessment metrics at Cedar Point, AL
Observed data time period: 3/15/2020 to 8/31/2020 with gaps of 16.30 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
S			36771	11.233									
s			36771	9.996									
S-s	3.5	24 h	36771	1.236	5.471	5.330	4.2	62.4	12.0	20.6	206.9		0.84

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
S000-s000	3.5	24 h	565	1.407	5.433	5.252	3.7	64.1	13.1	12.0	198.0		
S006-s006	3.5	24 h	563	1.519	5.560	5.353	3.7	63.6	13.0	12.0	198.0		
S012-s012	3.5	24 h	562	1.576	5.604	5.382	3.7	61.7	12.8	12.0	198.0		
S018-s018	3.5	24 h	561	1.616	5.742	5.514	3.9	60.8	13.2	6.0	198.0		
S024-s024	3.5	24 h	560	1.689	5.859	5.616	3.4	62.0	14.3	6.0	198.0		
S030-s030	3.5	24 h	559	1.790	5.860	5.585	3.8	61.0	13.8	12.0	198.0		
S036-s036	3.5	24 h	558	1.827	5.986	5.706	3.2	60.0	14.5	6.0	198.0		
S042-s042	3.5	24 h	557	1.844	6.008	5.723	3.4	60.0	14.4	6.0	174.0		
S048-s048	3.5	24 h	556	1.933	6.033	5.721	2.9	57.6	14.6	6.0	198.0		

Table E5: Water salinity skill assessment metrics at Dauphin Island, AL
Observed data time period: 3/15/2020 to 3/4/2021 with gaps of 73.84 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
S			67335	15.185									
s			67335	16.669									
S-s	3.5	24 h	67335	-1.484	7.015	6.856	17.6	42.0	8.7	34.1	76.8		0.73

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
S000-s000	3.5	24 h	1073	-1.525	7.151	6.990	17.4	42.4	9.3	24.0	162.0		
S006-s006	3.5	24 h	1071	-1.365	7.137	7.009	17.2	42.0	9.3	24.0	162.0		
S012-s012	3.5	24 h	1070	-1.298	7.178	7.063	17.5	43.1	10.2	48.0	174.0		
S018-s018	3.5	24 h	1069	-1.301	7.174	7.058	17.2	42.2	10.0	42.0	162.0		
S024-s024	3.5	24 h	1068	-1.166	7.161	7.069	16.7	42.7	10.2	36.0	132.0		
S030-s030	3.5	24 h	1067	-1.048	7.196	7.123	16.4	41.1	10.9	42.0	138.0		
S036-s036	3.5	24 h	1066	-1.090	7.224	7.144	17.3	41.8	11.4	42.0	126.0		
S042-s042	3.5	24 h	1065	-1.069	7.189	7.112	16.2	43.0	10.2	42.0	132.0		
S048-s048	3.5	24 h	1064	-1.055	7.228	7.154	16.4	41.4	11.3	42.0	168.0		

Table E6: Water salinity skill assessment metrics at Calcasieu Lake, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 106.16 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
S			61932	8.811									
s			61932	9.626									
S-s	3.5	24 h	61932	-0.815	2.952	2.838	0.6	73.6	0.0	19.9	0.0		0.86
SCENARIO: SEMI-OPERATIONAL FORECAST													
S000-s000	3.5	24 h	984	-0.852	2.960	2.836	0.6	73.6	0.0	12.0	0.0		
S006-s006	3.5	24 h	984	-0.848	2.960	2.838	0.6	73.9	0.0	12.0	0.0		
S012-s012	3.5	24 h	984	-0.846	2.962	2.840	0.6	73.3	0.0	12.0	0.0		
S018-s018	3.5	24 h	984	-0.849	2.969	2.846	0.6	73.2	0.0	12.0	0.0		
S024-s024	3.5	24 h	984	-0.839	2.952	2.831	0.5	73.6	0.0	12.0	0.0		
S030-s030	3.5	24 h	983	-0.838	2.965	2.845	0.5	73.6	0.0	12.0	0.0		
S036-s036	3.5	24 h	982	-0.842	2.981	2.861	0.5	72.7	0.0	0.0	0.0		
S042-s042	3.5	24 h	981	-0.845	2.981	2.861	0.5	73.2	0.0	12.0	0.0		
S048-s048	3.5	24 h	980	-0.850	3.003	2.882	0.5	72.7	0.0	12.0	0.0		

Table E7: Water salinity skill assessment metrics at USCG Calcasieu River, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 13.33 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE CRITERION	X -	N -	IMAX -	SM -	RMSE -	SD -	NOF <1%	CF >90%	POF <1%	MDNO <N	MDPO <N	WOF <.5%	SKILL
SCENARIO: SEMI-OPERATIONAL NOWCAST													
S			84212	2.263									
s			84212	2.711									
S-s	3.5	24 h	84212	-0.448	2.741	2.704	3.4	84.9	1.3	27.7	39.4		0.77
SCENARIO: SEMI-OPERATIONAL FORECAST													
S000-s000	3.5	24 h	1350	-0.460	2.791	2.754	3.8	85.0	1.5	36.0	72.0		
S006-s006	3.5	24 h	1350	-0.446	2.783	2.748	3.8	84.7	1.3	36.0	36.0		
S012-s012	3.5	24 h	1350	-0.441	2.766	2.731	3.9	84.9	1.4	36.0	72.0		
S018-s018	3.5	24 h	1350	-0.430	2.746	2.713	3.7	85.2	1.3	36.0	66.0		
S024-s024	3.5	24 h	1350	-0.413	2.738	2.708	3.6	85.0	1.2	36.0	36.0		
S030-s030	3.5	24 h	1349	-0.403	2.735	2.706	3.6	85.2	1.2	36.0	66.0		
S036-s036	3.5	24 h	1348	-0.395	2.740	2.712	3.6	85.3	1.2	36.0	66.0		
S042-s042	3.5	24 h	1347	-0.393	2.760	2.733	3.6	84.9	1.1	36.0	36.0		
S048-s048	3.5	24 h	1346	-0.385	2.771	2.745	3.5	84.0	1.0	36.0	36.0		

Table E8: Water salinity skill assessment metrics at Cameron, LA
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 56.48 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
S			73849	15.425									
s			73849	16.473									
S-s	3.5	24 h	73849	-1.048	4.238	4.107	7.9	63.0	3.9	20.6	15.0		0.82

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
S000-s000	3.5	24 h	1179	-1.133	4.273	4.122	8.1	62.0	3.5	12.0	12.0		
S006-s006	3.5	24 h	1179	-1.148	4.256	4.100	7.9	62.4	3.2	12.0	12.0		
S012-s012	3.5	24 h	1179	-1.101	4.264	4.121	8.0	61.9	3.7	12.0	12.0		
S018-s018	3.5	24 h	1179	-1.104	4.254	4.110	8.2	62.4	3.3	30.0	12.0		
S024-s024	3.5	24 h	1179	-1.170	4.258	4.096	8.1	62.6	3.1	30.0	6.0		
S030-s030	3.5	24 h	1178	-1.165	4.295	4.136	8.3	61.1	3.3	36.0	12.0		
S036-s036	3.5	24 h	1177	-1.140	4.250	4.096	8.2	62.2	3.3	24.0	12.0		
S042-s042	3.5	24 h	1176	-1.167	4.272	4.111	7.8	61.6	3.4	18.0	6.0		
S048-s048	3.5	24 h	1175	-1.202	4.291	4.121	8.1	62.0	3.1	18.0	6.0		

Table E9: Water salinity skill assessment metrics at Round Island Light, MS
Observed data time period: 3/15/2020 to 3/6/2021 with gaps of 63.16 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
S			70208	17.986									
s			70208	18.577									
S-s	3.5	24 h	70208	-0.591	5.130	5.096	9.4	53.0	6.1	82.1	63.7		0.75
SCENARIO: SEMI-OPERATIONAL FORECAST													
S000-s000	3.5	24 h	1113	-0.697	5.069	5.023	9.7	52.1	5.3	120.0	54.0		
S006-s006	3.5	24 h	1112	-0.532	5.020	4.994	9.3	52.3	5.8	114.0	60.0		
S012-s012	3.5	24 h	1111	-0.563	4.983	4.954	9.5	52.5	5.1	108.0	60.0		
S018-s018	3.5	24 h	1110	-0.461	4.967	4.948	8.6	53.4	5.8	102.0	60.0		
S024-s024	3.5	24 h	1109	-0.496	5.079	5.057	10.2	52.0	5.8	96.0	60.0		
S030-s030	3.5	24 h	1108	-0.498	5.076	5.053	9.2	52.4	5.9	90.0	60.0		
S036-s036	3.5	24 h	1107	-0.450	5.084	5.067	9.4	52.1	6.3	84.0	60.0		
S042-s042	3.5	24 h	1106	-0.507	5.114	5.091	9.7	51.9	6.1	78.0	54.0		
S048-s048	3.5	24 h	1105	-0.537	5.204	5.179	10.3	51.6	7.2	72.0	48.0		

Table E10: Water salinity skill assessment metrics at East Ship Island Light, MS
Observed data time period: 3/15/2020 to 7/20/2020 with gaps of 32.59 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
S			22592	19.772									
s			22592	17.347									
S-s	3.5	24 h	22592	2.425	3.450	2.454	0.0	64.7	3.0	0.0	14.0		0.78
SCENARIO: SEMI-OPERATIONAL FORECAST													
S000-s000	3.5	24 h	341	2.417	3.408	2.406	0.0	63.6	2.3	0.0	6.0		
S006-s006	3.5	24 h	339	2.415	3.436	2.449	0.0	65.2	3.2	0.0	12.0		
S012-s012	3.5	24 h	337	2.402	3.462	2.496	0.0	63.2	3.6	0.0	12.0		
S018-s018	3.5	24 h	336	2.396	3.443	2.477	0.0	64.0	3.0	0.0	30.0		
S024-s024	3.5	24 h	335	2.347	3.452	2.535	0.0	65.1	3.3	0.0	12.0		
S030-s030	3.5	24 h	334	2.287	3.459	2.598	0.0	64.1	3.0	0.0	12.0		
S036-s036	3.5	24 h	333	2.239	3.440	2.616	0.0	63.4	2.4	0.0	12.0		
S042-s042	3.5	24 h	331	2.270	3.471	2.629	0.0	62.8	3.0	0.0	12.0		
S048-s048	3.5	24 h	329	2.242	3.502	2.695	0.0	63.5	3.0	0.0	6.0		

Table E11: Water salinity skill assessment metrics at Biloxi Bay, MS
Observed data time period: 3/15/2020 to 3/15/2021 with gaps of 27.81 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
S			80737	15.174									
s			80737	15.362									
S-s	3.5	24 h	80737	-0.188	3.289	3.283	0.4	69.0	2.2	11.4	31.2		0.80
SCENARIO: SEMI-OPERATIONAL FORECAST													
S000-s000	3.5	24 h	1295	-0.209	3.336	3.331	0.3	69.0	2.9	6.0	48.0		
S006-s006	3.5	24 h	1294	-0.198	3.339	3.334	0.3	69.5	2.9	6.0	48.0		
S012-s012	3.5	24 h	1293	-0.188	3.348	3.344	0.4	69.2	2.9	6.0	48.0		
S018-s018	3.5	24 h	1292	-0.186	3.349	3.346	0.4	68.9	2.9	6.0	48.0		
S024-s024	3.5	24 h	1291	-0.194	3.349	3.345	0.4	69.2	2.9	6.0	48.0		
S030-s030	3.5	24 h	1290	-0.198	3.357	3.352	0.4	69.6	3.0	6.0	48.0		
S036-s036	3.5	24 h	1289	-0.196	3.361	3.357	0.4	69.0	3.0	6.0	48.0		
S042-s042	3.5	24 h	1288	-0.198	3.365	3.361	0.5	69.3	3.0	6.0	48.0		
S048-s048	3.5	24 h	1287	-0.190	3.381	3.377	0.5	68.9	3.0	12.0	48.0		

Table E12: Water salinity skill assessment metrics at Gulfport Light, MS
Observed data time period: 3/15/2020 to 2/12/2021 with gaps of 87.15 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

S			59374	18.991									
s			59374	17.511									
S-s	3.5	24 h	59374	1.480	6.161	5.980	1.8	50.0	23.3	54.0	801.3		0.49

SCENARIO: SEMI-OPERATIONAL FORECAST

S000-s000	3.5	24 h	963	1.560	6.224	6.029	1.7	49.0	23.9	48.0	798.0		
S006-s006	3.5	24 h	962	1.572	6.226	6.027	1.7	49.2	23.9	48.0	798.0		
S012-s012	3.5	24 h	960	1.584	6.229	6.027	2.0	49.4	24.0	48.0	798.0		
S018-s018	3.5	24 h	958	1.593	6.238	6.034	2.1	49.4	24.1	48.0	798.0		
S024-s024	3.5	24 h	958	1.594	6.243	6.039	2.0	49.8	24.0	48.0	798.0		
S030-s030	3.5	24 h	957	1.590	6.253	6.051	2.0	49.9	24.1	48.0	798.0		
S036-s036	3.5	24 h	956	1.590	6.262	6.060	2.1	49.8	24.2	36.0	798.0		
S042-s042	3.5	24 h	955	1.583	6.266	6.066	2.4	48.8	24.1	42.0	798.0		
S048-s048	3.5	24 h	954	1.571	6.265	6.068	2.4	49.1	24.2	48.0	798.0		

Table E13: Water salinity skill assessment metrics at Merrill Shell Light, MS
Observed data time period: 3/15/2020 to 3/17/2021 with gaps of 69.91 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE CRITERION	X -	N -	IMAX -	SM -	RMSE -	SD -	NOF <1%	CF >90%	POF <1%	MDNO <N	MDPO <N	WOF <.5%	SKILL
SCENARIO: SEMI-OPERATIONAL NOWCAST													
S			70751	15.849									
s			70751	15.344									
S-s	3.5	24 h	70751	0.505	3.700	3.665	1.0	59.7	2.5	11.9	16.5		0.86
SCENARIO: SEMI-OPERATIONAL FORECAST													
S000-s000	3.5	24 h	1144	0.606	3.766	3.719	0.8	58.7	3.1	6.0	12.0		
S006-s006	3.5	24 h	1144	0.633	3.764	3.712	0.7	58.9	3.1	6.0	12.0		
S012-s012	3.5	24 h	1144	0.655	3.744	3.688	0.8	58.7	2.9	6.0	18.0		
S018-s018	3.5	24 h	1144	0.690	3.745	3.683	0.7	59.2	3.1	6.0	12.0		
S024-s024	3.5	24 h	1143	0.692	3.753	3.690	0.9	58.9	3.2	6.0	12.0		
S030-s030	3.5	24 h	1141	0.723	3.787	3.719	0.9	58.5	3.3	6.0	18.0		
S036-s036	3.5	24 h	1139	0.722	3.808	3.741	1.1	56.7	3.4	18.0	18.0		
S042-s042	3.5	24 h	1137	0.732	3.818	3.749	1.2	58.0	3.4	6.0	18.0		
S048-s048	3.5	24 h	1136	0.735	3.838	3.769	1.3	57.7	3.3	12.0	18.0		

Table E14: Water salinity skill assessment metrics at Joseph Island Light, MS
Observed data time period: 3/15/2020 to 7/15/2020 with gaps of 0.00 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
S			29283	3.860									
s			29283	4.305									
S-s	3.5	24 h	29283	-0.446	3.145	3.113	1.9	72.7	1.8	12.5	11.5		0.77

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
S000-s000	3.5	24 h	439	-0.384	3.186	3.167	2.1	70.8	1.4	18.0	6.0		
S006-s006	3.5	24 h	438	-0.382	3.191	3.172	2.1	70.8	1.6	18.0	6.0		
S012-s012	3.5	24 h	437	-0.404	3.162	3.140	1.6	72.1	1.8	12.0	6.0		
S018-s018	3.5	24 h	436	-0.390	3.153	3.132	1.8	72.0	1.1	12.0	0.0		
S024-s024	3.5	24 h	435	-0.399	3.129	3.107	1.6	71.0	0.9	6.0	0.0		
S030-s030	3.5	24 h	434	-0.402	3.136	3.113	1.8	71.4	1.2	6.0	6.0		
S036-s036	3.5	24 h	433	-0.370	3.173	3.155	1.8	71.6	1.6	12.0	6.0		
S042-s042	3.5	24 h	432	-0.352	3.172	3.156	1.6	72.0	1.2	12.0	0.0		
S048-s048	3.5	24 h	431	-0.323	3.257	3.245	1.6	70.8	1.4	12.0	6.0		

APPENDIX F: TIME SERIES OF MODELED WATER SALINITY VERSUS OBSERVATIONS
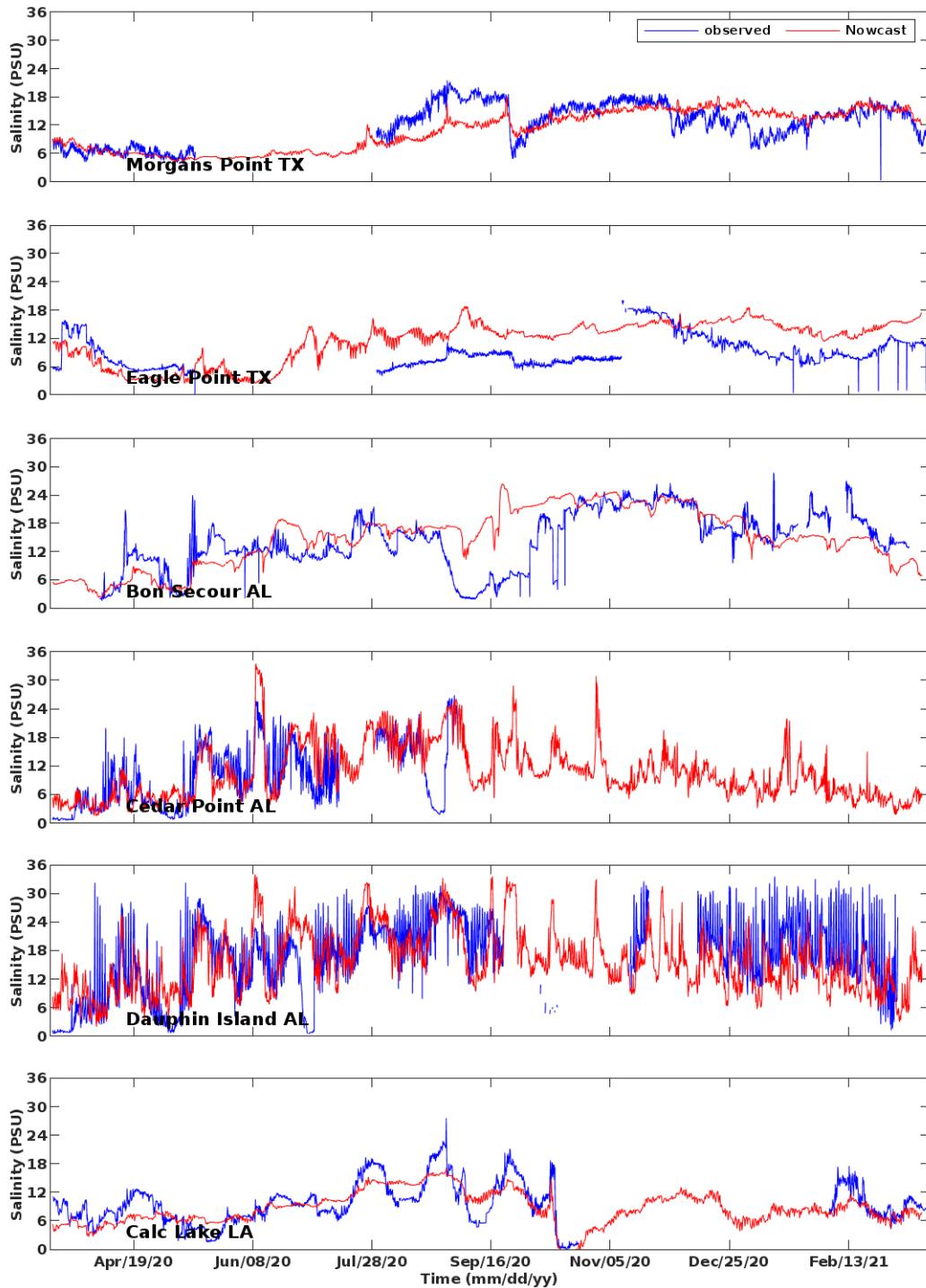
Figure F-1. Time series of modeled (red) versus observed (blue) water salinities at stations (from upper to lower): Morgans Point, TX; Eagle Point, TX; Bon Secour, AL; Cedar Point, AL; Dauphin Island, AL; and Calcasieu Lake, LA.
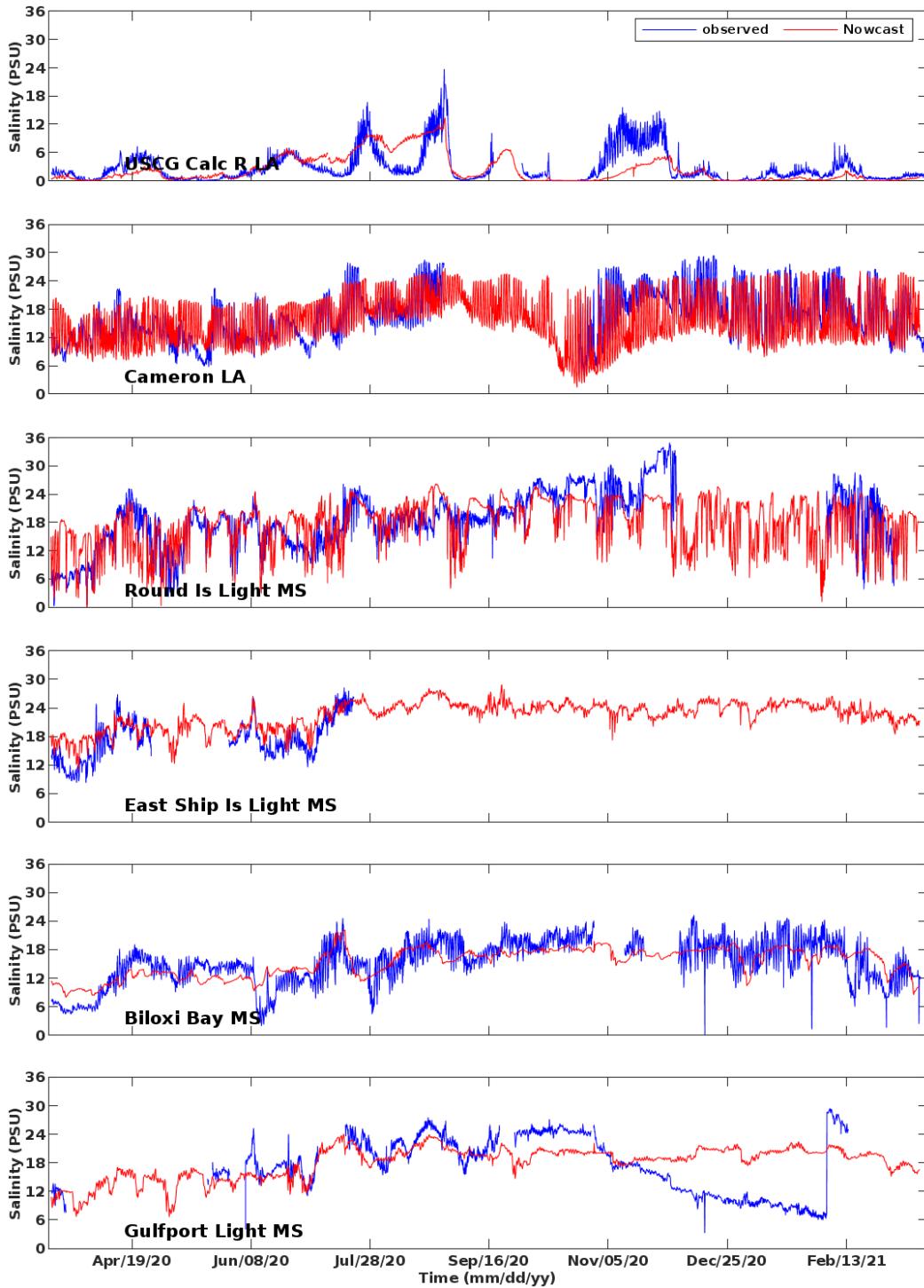
Figure F-2. Time series of modeled (red) versus observed (blue) water salinities at stations (from upper to lower): USCG Calcasieu River, LA; Cameron, LA; Round Island Light, MS; East Ship Island Light, MS; Biloxi Bay, MS; and Gulfport Light, MS.
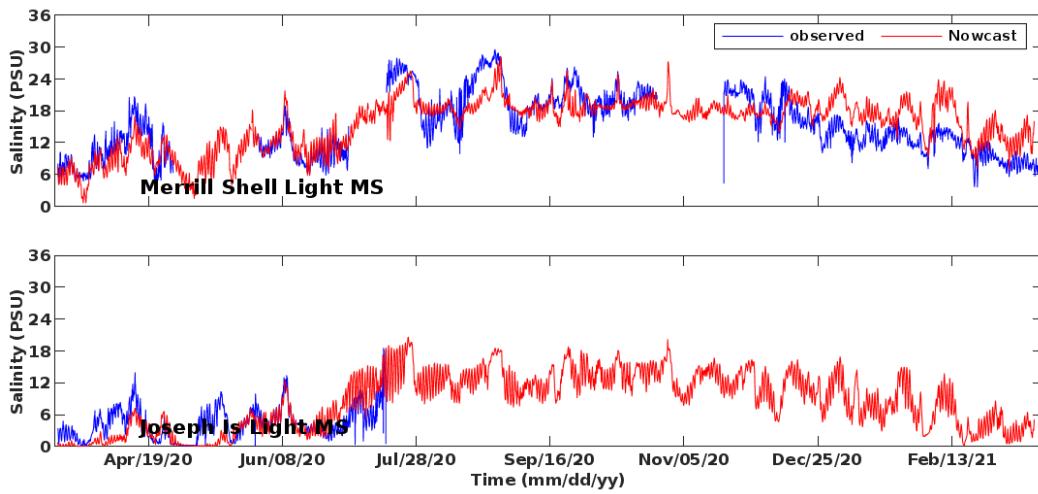
Figure F-3. Time series of modeled (red) versus observed (blue) water salinities at stations: Merrill Shell Light, MS (upper panel) and Joseph Island Light, MS (lower panel).

APPENDIX G: WATER CURRENT SPEED MODEL SKILL ASSESSMENT METRICS TABLES

Table G1: Water current speed skill assessment metrics at TABS Buoy B, TX
Observed data time period: 6/15/2020 to 3/16/2021 with gaps of 39.35 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
U			56271	0.206									
u			56271	0.197									
U-u	26 cm/s	24 h	56271	0.009	0.153	0.153	0.6	91.1	0.2	4.3	2.8		0.64
AFC-afc	26 cm/s	24 h	26	-0.035	0.168	0.168	3.8	92.3	0.0	0.0	0.0		
AEC-aec	26 cm/s	24 h	55	0.027	0.129	0.127	1.8	94.5	0.0	0.0	0.0		
TFC-tfc	0.50 h	25 h	26	-0.112	1.558	1.585	30.8	26.9	34.6	0.0	0.0		
TEC-tec	0.50 h	25 h	55	-0.116	1.448	1.457	29.1	20.0	25.5	10.0	0.0		
SCENARIO: SEMI-OPERATIONAL FORECAST													
U000-u000	26 cm/s	24 h	121	0.001	0.176	0.176	1.7	86.8	0.0	0.0	0.0		
U006-u006	26 cm/s	24 h	121	0.008	0.171	0.172	0.8	85.1	0.0	0.0	0.0		
U012-u012	26 cm/s	24 h	124	0.005	0.185	0.185	2.4	86.3	0.0	0.0	0.0		
U018-u018	26 cm/s	24 h	123	0.004	0.180	0.181	2.4	87.0	0.0	0.0	0.0		
U024-u024	26 cm/s	24 h	125	0.011	0.173	0.173	3.2	89.6	0.0	6.0	0.0		
U030-u030	26 cm/s	24 h	127	0.007	0.169	0.169	1.6	86.6	0.0	0.0	0.0		
U036-u036	26 cm/s	24 h	117	0.026	0.248	0.248	2.6	84.6	1.7	6.0	0.0		
U042-u042	26 cm/s	24 h	117	0.015	0.197	0.197	0.9	86.3	0.9	0.0	0.0		
U048-u048	26 cm/s	24 h	120	0.002	0.199	0.199	4.2	85.8	0.0	6.0	0.0		
AFC-afc	26 cm/s	24 h	30	-0.016	0.138	0.139	3.3	96.7	0.0	0.0	0.0		
AEC-aec	26 cm/s	24 h	48	0.017	0.142	0.142	0.0	93.8	0.0	0.0	0.0		
TFC-tfc	0.50 h	25 h	30	0.137	1.519	1.539	23.3	33.3	30.0	0.0	0.0		
TEC-tec	0.50 h	25 h	48	0.054	1.330	1.342	25.0	14.6	27.1	0.0	0.0		

Table G2: Water current speed skill assessment metrics at TABS Buoy K, TX
Observed data time period: 6/15/2020 to 3/16/2021 with gaps of 3.83 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
U			63042	0.181									
u			63042	0.273									
U-u	26 cm/s	24 h	63042	-0.092	0.207	0.185	3.5	83.0	0.0	29.8	0.0		0.59
AFC-afc	26 cm/s	24 h	59	-0.234	0.332	0.237	15.3	55.9	0.0	0.0	0.0		
AEC-aec	26 cm/s	24 h	26	-0.144	0.210	0.157	0.0	76.9	0.0	0.0	0.0		
TFC-tfc	0.50 h	25 h	59	-0.212	1.701	1.703	40.7	11.9	27.1	0.0	0.0		
TEC-tec	0.50 h	25 h	26	0.408	1.563	1.539	19.2	23.1	42.3	0.0	0.0		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
U000-u000	26 cm/s	24 h	151	-0.203	0.269	0.177	6.6	69.5	0.0	6.0	0.0		
U006-u006	26 cm/s	24 h	153	-0.205	0.272	0.180	7.8	68.0	0.0	6.0	0.0		
U012-u012	26 cm/s	24 h	173	-0.196	0.263	0.176	6.4	69.9	0.0	6.0	0.0		
U018-u018	26 cm/s	24 h	158	-0.198	0.266	0.179	6.3	67.7	0.0	6.0	0.0		
U024-u024	26 cm/s	24 h	151	-0.206	0.276	0.185	6.6	64.2	0.0	6.0	0.0		
U030-u030	26 cm/s	24 h	148	-0.203	0.273	0.183	6.8	68.2	0.0	0.0	0.0		
U036-u036	26 cm/s	24 h	148	-0.212	0.282	0.185	8.1	65.5	0.0	6.0	0.0		
U042-u042	26 cm/s	24 h	152	-0.220	0.288	0.187	7.2	62.5	0.0	0.0	0.0		
U048-u048	26 cm/s	24 h	145	-0.224	0.294	0.190	8.3	60.0	0.0	30.0	0.0		
AFC-afc	26 cm/s	24 h	64	-0.222	0.314	0.223	10.9	59.4	0.0	0.0	0.0		
AEC-aec	26 cm/s	24 h	30	-0.138	0.204	0.152	0.0	76.7	0.0	0.0	0.0		
TFC-tfc	0.50 h	25 h	64	-0.364	1.706	1.680	39.1	10.9	21.9	0.0	0.0		
TEC-tec	0.50 h	25 h	30	0.187	1.753	1.773	26.7	16.7	36.7	0.0	0.0		

Table G3: Water current speed skill assessment metrics at Cameron Fishing Pier, LA
Observed data time period: 3/15/2020 to 3/16/2021 with gaps of 42.59 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
U			77305	0.456									
u			77305	0.609									
U-u	26 cm/s	24 h	77305	-0.153	0.312	0.272	9.6	62.9	0.6	7.2	2.4		0.80
AFC-afc	26 cm/s	24 h	247	-0.279	0.372	0.246	15.8	53.0	0.0	23.2	0.0		
AEC-aec	26 cm/s	24 h	341	-0.527	0.586	0.257	52.2	17.0	0.0	97.8	0.0		
TFC-tfc	0.50 h	25 h	247	0.083	0.839	0.836	10.5	37.7	8.9	0.0	24.2		
TEC-tec	0.50 h	25 h	341	0.068	0.979	0.978	14.1	35.5	15.0	24.8	24.3		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
U000-u000	26 cm/s	24 h	759	-0.206	0.334	0.263	12.5	62.1	0.1	48.0	0.0		
U006-u006	26 cm/s	24 h	755	-0.210	0.337	0.263	12.1	60.0	0.1	48.0	0.0		
U012-u012	26 cm/s	24 h	754	-0.210	0.340	0.268	12.9	60.2	0.1	24.0	0.0		
U018-u018	26 cm/s	24 h	744	-0.212	0.339	0.265	13.0	60.3	0.1	24.0	0.0		
U024-u024	26 cm/s	24 h	750	-0.210	0.340	0.268	11.9	61.2	0.1	48.0	0.0		
U030-u030	26 cm/s	24 h	743	-0.210	0.344	0.272	12.1	59.8	0.1	24.0	0.0		
U036-u036	26 cm/s	24 h	746	-0.211	0.342	0.269	11.9	59.7	0.0	24.0	0.0		
U042-u042	26 cm/s	24 h	754	-0.206	0.342	0.273	12.2	59.5	0.3	24.0	0.0		
U048-u048	26 cm/s	24 h	737	-0.212	0.343	0.271	14.1	60.9	0.0	30.0	0.0		
AFC-afc	26 cm/s	24 h	233	-0.276	0.372	0.250	15.9	51.1	0.0	11.2	0.0		
AEC-aec	26 cm/s	24 h	330	-0.528	0.587	0.258	50.3	17.3	0.0	97.8	0.0		
TFC-tfc	0.50 h	25 h	233	0.056	0.863	0.863	11.6	43.3	8.6	0.0	0.0		
TEC-tec	0.50 h	25 h	330	0.140	0.982	0.973	10.9	36.7	17.9	24.8	50.7		

Table G4: Water current speed skill assessment metrics at USCG Sabine, LA
Observed data time period: 3/15/2020 to 3/16/2021 with gaps of 0.80 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
U			87265	0.290									
u			87265	0.373									
U-u	26 cm/s	24 h	87265	-0.082	0.233	0.218	3.1	75.3	0.1	6.4	2.7		0.70
AFC-afc	26 cm/s	24 h	236	-0.334	0.369	0.157	10.6	28.8	0.0	0.0	0.0		
AEC-aec	26 cm/s	24 h	241	-0.436	0.473	0.182	32.4	17.4	0.0	34.0	0.0		
TFC-tfc	0.50 h	25 h	236	0.229	1.282	1.264	20.3	19.9	30.1	24.3	73.0		
TEC-tec	0.50 h	25 h	241	0.381	1.280	1.225	14.1	23.7	32.8	0.0	48.5		
SCENARIO: SEMI-OPERATIONAL FORECAST													
U000-u000	26 cm/s	24 h	570	-0.157	0.258	0.205	4.0	70.7	0.2	0.0	0.0		
U006-u006	26 cm/s	24 h	572	-0.159	0.259	0.204	4.4	69.2	0.3	0.0	0.0		
U012-u012	26 cm/s	24 h	567	-0.164	0.259	0.201	4.4	70.4	0.0	6.0	0.0		
U018-u018	26 cm/s	24 h	571	-0.163	0.260	0.204	4.6	69.2	0.2	24.0	0.0		
U024-u024	26 cm/s	24 h	574	-0.165	0.261	0.202	4.2	69.5	0.2	6.0	0.0		
U030-u030	26 cm/s	24 h	572	-0.165	0.263	0.204	4.9	68.9	0.2	0.0	0.0		
U036-u036	26 cm/s	24 h	575	-0.166	0.268	0.210	5.0	67.8	0.2	0.0	0.0		
U042-u042	26 cm/s	24 h	575	-0.164	0.261	0.203	4.3	69.2	0.2	24.0	0.0		
U048-u048	26 cm/s	24 h	572	-0.167	0.264	0.204	4.9	68.7	0.0	24.0	0.0		
AFC-afc	26 cm/s	24 h	213	-0.332	0.368	0.159	12.2	30.5	0.0	0.0	0.0		
AEC-aec	26 cm/s	24 h	233	-0.438	0.474	0.181	32.6	16.7	0.0	25.0	0.0		
TFC-tfc	0.50 h	25 h	213	0.212	1.262	1.247	20.2	22.1	29.1	0.0	23.2		
TEC-tec	0.50 h	25 h	233	0.470	1.290	1.205	12.4	24.5	35.6	0.0	48.5		

Table G5: Water current speed skill assessment metrics at Sabine Front Range, LA
Observed data time period: 3/15/2020 to 3/16/2021 with gaps of 15.45 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
U			83764	0.173									
u			83764	0.510									
U-u	26 cm/s	24 h	83764	-0.337	0.437	0.279	26.2	43.0	0.0	11.5	0.0		0.54
AFC-afc	26 cm/s	24 h	152	-0.702	0.752	0.272	71.7	7.9	0.0	24.5	0.0		
AEC-aec	26 cm/s	24 h	333	-0.669	0.693	0.184	78.7	0.9	0.0	73.9	0.0		
TFC-tfc	0.50 h	25 h	152	-0.490	1.362	1.275	37.5	21.7	11.2	24.5	0.0		
TEC-tec	0.50 h	25 h	333	0.800	1.473	1.239	9.0	18.3	46.5	0.0	73.5		
SCENARIO: SEMI-OPERATIONAL FORECAST													
U000-u000	26 cm/s	24 h	243	-0.523	0.566	0.217	50.2	10.7	0.0	114.0	0.0		
U006-u006	26 cm/s	24 h	237	-0.524	0.567	0.218	50.2	11.0	0.0	114.0	0.0		
U012-u012	26 cm/s	24 h	244	-0.525	0.573	0.230	49.6	11.9	0.0	114.0	0.0		
U018-u018	26 cm/s	24 h	238	-0.528	0.572	0.221	51.3	10.5	0.0	114.0	0.0		
U024-u024	26 cm/s	24 h	237	-0.524	0.568	0.219	51.1	11.4	0.0	96.0	0.0		
U030-u030	26 cm/s	24 h	223	-0.535	0.578	0.218	52.9	9.9	0.0	96.0	0.0		
U036-u036	26 cm/s	24 h	225	-0.534	0.574	0.212	51.6	11.1	0.0	96.0	0.0		
U042-u042	26 cm/s	24 h	242	-0.531	0.577	0.225	50.4	10.7	0.0	114.0	0.0		
U048-u048	26 cm/s	24 h	226	-0.534	0.575	0.215	52.7	10.2	0.0	96.0	0.0		
AFC-afc	26 cm/s	24 h	143	-0.710	0.762	0.277	72.0	7.7	0.0	24.5	0.0		
AEC-aec	26 cm/s	24 h	314	-0.676	0.701	0.188	79.9	0.6	0.0	233.9	0.0		
TFC-tfc	0.50 h	25 h	143	-0.513	1.269	1.165	37.1	27.3	9.8	0.0	0.0		
TEC-tec	0.50 h	25 h	314	0.807	1.481	1.244	8.6	21.3	46.8	11.7	123.7		

Table G6: Water current speed skill assessment metrics at Port Arthur, TX
Observed data time period: 3/15/2020 to 3/16/2021 with gaps of 2.87 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
U			86770	0.374									
u			86770	0.416									
U-u	26 cm/s	24 h	86770	-0.042	0.208	0.203	0.7	79.5	0.7	6.8	2.0		0.82
AFC-afc	26 cm/s	24 h	249	-0.188	0.274	0.200	6.0	61.8	0.0	0.0	0.0		
AEC-aec	26 cm/s	24 h	353	-0.223	0.254	0.122	0.8	62.9	0.0	0.0	0.0		
TFC-tfc	0.50 h	25 h	249	-1.096	1.536	1.078	55.8	11.6	6.0	49.0	0.0		
TEC-tec	0.50 h	25 h	353	-0.631	1.119	0.926	33.1	28.6	2.0	47.5	0.0		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
U000-u000	26 cm/s	24 h	710	-0.095	0.198	0.174	0.6	81.7	0.4	0.0	0.0		
U006-u006	26 cm/s	24 h	704	-0.100	0.202	0.175	0.7	80.0	0.3	0.0	0.0		
U012-u012	26 cm/s	24 h	709	-0.102	0.206	0.179	0.7	80.0	0.3	0.0	0.0		
U018-u018	26 cm/s	24 h	710	-0.097	0.206	0.181	0.8	79.0	0.4	0.0	0.0		
U024-u024	26 cm/s	24 h	709	-0.098	0.205	0.180	0.4	78.4	0.4	0.0	0.0		
U030-u030	26 cm/s	24 h	701	-0.103	0.209	0.182	0.6	78.6	0.4	0.0	0.0		
U036-u036	26 cm/s	24 h	705	-0.103	0.208	0.181	0.9	77.7	0.3	0.0	0.0		
U042-u042	26 cm/s	24 h	706	-0.099	0.208	0.183	0.7	78.2	0.4	0.0	0.0		
U048-u048	26 cm/s	24 h	697	-0.103	0.207	0.180	0.7	77.5	0.3	0.0	0.0		
AFC-afc	26 cm/s	24 h	235	-0.191	0.277	0.201	6.0	59.1	0.0	0.0	0.0		
AEC-aec	26 cm/s	24 h	345	-0.220	0.253	0.126	0.6	61.7	0.0	0.0	0.0		
TFC-tfc	0.50 h	25 h	235	-1.088	1.598	1.173	58.3	8.9	7.7	49.0	0.0		
TEC-tec	0.50 h	25 h	345	-0.634	1.116	0.920	34.8	31.9	2.0	83.9	0.0		

Table G7: Water current speed skill assessment metrics at GB Entrance Channel, TX
Observed data time period: 3/15/2020 to 1/4/2021 with gaps of 132.45 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
U			39160	0.480									
u			39160	0.496									
U-u	26 cm/s	24 h	39160	-0.016	0.178	0.177	0.7	87.6	0.4	4.0	2.0		0.90
AFC-afc	26 cm/s	24 h	113	-0.132	0.173	0.112	0.0	87.6	0.0	0.0	0.0		
AEC-aec	26 cm/s	24 h	151	-0.034	0.162	0.159	0.0	87.4	0.0	0.0	0.0		
TFC-tfc	0.50 h	25 h	113	-0.207	1.031	1.015	21.2	29.2	13.3	0.0	0.0		
TEC-tec	0.50 h	25 h	151	-0.319	1.333	1.299	29.1	25.2	16.6	24.6	0.0		
SCENARIO: SEMI-OPERATIONAL FORECAST													
U000-u000	26 cm/s	24 h	388	-0.011	0.184	0.184	0.5	87.1	1.3	0.0	0.0		
U006-u006	26 cm/s	24 h	390	-0.016	0.183	0.183	0.3	87.7	1.0	0.0	0.0		
U012-u012	26 cm/s	24 h	391	-0.021	0.186	0.186	0.3	88.5	0.8	0.0	0.0		
U018-u018	26 cm/s	24 h	387	-0.018	0.178	0.177	0.0	90.2	1.0	0.0	0.0		
U024-u024	26 cm/s	24 h	395	-0.015	0.182	0.181	0.3	88.6	1.0	0.0	0.0		
U030-u030	26 cm/s	24 h	388	-0.017	0.184	0.184	0.5	89.2	1.0	0.0	0.0		
U036-u036	26 cm/s	24 h	385	-0.019	0.182	0.182	0.3	88.1	0.8	0.0	0.0		
U042-u042	26 cm/s	24 h	383	-0.013	0.186	0.186	0.5	87.2	1.0	0.0	0.0		
U048-u048	26 cm/s	24 h	383	-0.026	0.186	0.184	0.3	86.7	0.5	0.0	0.0		
AFC-afc	26 cm/s	24 h	105	-0.133	0.171	0.108	0.0	91.4	0.0	0.0	0.0		
AEC-aec	26 cm/s	24 h	145	-0.035	0.162	0.159	0.0	86.2	0.7	0.0	0.0		
TFC-tfc	0.50 h	25 h	105	-0.270	1.044	1.013	22.9	33.3	13.3	0.0	0.0		
TEC-tec	0.50 h	25 h	145	-0.353	1.387	1.346	29.7	22.8	14.5	0.0	0.0		

Table G8: Water current speed skill assessment metrics at MB Entrance Channel, TX
Observed data time period: 3/15/2020 to 3/16/2021 with gaps of 7.24 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
U			85725	0.929									
u			85725	1.067									
U-u	26 cm/s	24 h	85725	-0.138	0.355	0.327	10.7	55.0	2.3	13.6	5.7		0.89
AFC-afc	26 cm/s	24 h	331	-0.387	0.432	0.193	23.6	22.7	0.0	48.9	0.0		
AEC-aec	26 cm/s	24 h	352	-0.286	0.367	0.229	14.2	48.3	0.0	23.9	0.0		
TFC-tfc	0.50 h	25 h	331	0.397	1.045	0.969	5.7	41.4	23.6	0.0	23.7		
TEC-tec	0.50 h	25 h	352	0.249	1.033	1.004	10.5	32.4	22.2	24.5	48.9		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
U000-u000	26 cm/s	24 h	1097	-0.171	0.335	0.288	9.1	56.9	1.1	12.0	0.0		
U006-u006	26 cm/s	24 h	1095	-0.175	0.341	0.293	10.0	56.1	1.3	12.0	6.0		
U012-u012	26 cm/s	24 h	1095	-0.183	0.353	0.302	11.1	55.3	1.1	24.0	0.0		
U018-u018	26 cm/s	24 h	1098	-0.180	0.351	0.301	10.7	54.2	1.1	18.0	0.0		
U024-u024	26 cm/s	24 h	1095	-0.182	0.350	0.299	10.9	54.3	0.9	18.0	0.0		
U030-u030	26 cm/s	24 h	1099	-0.184	0.354	0.303	10.9	53.9	1.0	18.0	0.0		
U036-u036	26 cm/s	24 h	1088	-0.180	0.353	0.304	10.8	54.8	1.1	24.0	0.0		
U042-u042	26 cm/s	24 h	1091	-0.182	0.356	0.306	11.2	54.9	0.9	18.0	0.0		
U048-u048	26 cm/s	24 h	1094	-0.178	0.352	0.303	11.2	55.5	1.3	12.0	0.0		
AFC-afc	26 cm/s	24 h	320	-0.400	0.443	0.192	25.0	20.3	0.0	24.7	0.0		
AEC-aec	26 cm/s	24 h	343	-0.293	0.377	0.238	15.5	48.1	0.0	0.0	0.0		
TFC-tfc	0.50 h	25 h	320	0.338	1.002	0.945	5.9	39.4	22.5	0.0	24.6		
TEC-tec	0.50 h	25 h	343	0.291	1.056	1.016	10.5	37.6	24.5	24.5	96.6		

Table G9: Water current speed skill assessment metrics at Port Aransas Channel View, TX
Observed data time period: 3/15/2020 to 3/16/2021 with gaps of 14.03 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	

SCENARIO: SEMI-OPERATIONAL NOWCAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
U			84101	0.617									
u			84101	0.650									
U-u	26 cm/s	24 h	84101	-0.032	0.234	0.232	2.0	74.9	1.0	5.7	6.9		0.89
AFC-afc	26 cm/s	24 h	288	-0.187	0.253	0.171	3.5	67.7	0.0	0.0	0.0		
AEC-aec	26 cm/s	24 h	326	-0.192	0.263	0.180	3.4	66.9	0.3	0.0	0.0		
TFC-tfc	0.50 h	25 h	288	0.248	1.098	1.072	11.1	29.5	25.3	24.8	48.6		
TEC-tec	0.50 h	25 h	326	-0.186	1.090	1.076	21.2	32.8	13.5	24.6	24.6		

SCENARIO: SEMI-OPERATIONAL FORECAST

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
U000-u000	26 cm/s	24 h	964	-0.045	0.218	0.213	1.3	78.4	0.4	0.0	0.0		
U006-u006	26 cm/s	24 h	967	-0.047	0.220	0.215	1.7	78.9	0.5	24.0	0.0		
U012-u012	26 cm/s	24 h	977	-0.052	0.226	0.220	1.8	77.1	0.4	24.0	0.0		
U018-u018	26 cm/s	24 h	975	-0.053	0.228	0.222	2.2	77.5	0.4	24.0	0.0		
U024-u024	26 cm/s	24 h	963	-0.054	0.226	0.220	2.4	78.4	0.3	24.0	0.0		
U030-u030	26 cm/s	24 h	965	-0.049	0.227	0.221	1.8	77.9	0.3	24.0	0.0		
U036-u036	26 cm/s	24 h	967	-0.049	0.224	0.219	1.8	77.1	0.4	24.0	0.0		
U042-u042	26 cm/s	24 h	962	-0.048	0.222	0.217	1.7	77.5	0.4	6.0	0.0		
U048-u048	26 cm/s	24 h	959	-0.048	0.224	0.219	1.6	78.1	0.6	0.0	0.0		
AFC-afc	26 cm/s	24 h	263	-0.204	0.269	0.176	4.6	63.9	0.0	0.0	0.0		
AEC-aec	26 cm/s	24 h	307	-0.201	0.270	0.180	4.6	64.8	0.0	0.0	0.0		
TFC-tfc	0.50 h	25 h	263	0.235	1.058	1.034	10.6	31.9	22.8	24.8	72.3		
TEC-tec	0.50 h	25 h	307	-0.231	1.086	1.062	23.5	38.8	13.7	48.6	24.6		

Table G10: Water current speed skill assessment metrics at Oxy Oil and Gas CM, TX
Observed data time period: 3/15/2020 to 3/15/2021 with gaps of 23.12 days
Data gap is filled by Singular Value Decomposition (SVD) method
Data are not filtered

VARIABLE	X	N	IMAX	SM	RMSE	SD	NOF	CF	POF	MDNO	MDPO	WOF	SKILL
CRITERION	-	-	-	-	-	-	<1%	>90%	<1%	<N	<N	<.5%	
SCENARIO: SEMI-OPERATIONAL NOWCAST													
U			81926	0.150									
u			81926	0.185									
U-u	26 cm/s	24 h	81926	-0.035	0.103	0.097	0.0	98.4	0.0	0.3	0.0		0.73
AFC-afc	26 cm/s	24 h	197	-0.101	0.139	0.096	0.5	94.9	0.0	0.0	0.0		
AEC-aec	26 cm/s	24 h	211	-0.220	0.240	0.096	0.5	70.1	0.0	0.0	0.0		
TFC-tfc	0.50 h	25 h	197	-0.232	1.372	1.356	27.9	28.4	20.8	0.0	0.0		
TEC-tec	0.50 h	25 h	211	-0.553	1.207	1.075	32.7	25.6	8.1	49.5	0.0		
SCENARIO: SEMI-OPERATIONAL FORECAST													
U000-u000	26 cm/s	24 h	106	-0.075	0.110	0.081	0.0	99.1	0.0	0.0	0.0		
U006-u006	26 cm/s	24 h	104	-0.066	0.109	0.087	0.0	99.0	0.0	0.0	0.0		
U012-u012	26 cm/s	24 h	101	-0.068	0.104	0.079	0.0	99.0	0.0	0.0	0.0		
U018-u018	26 cm/s	24 h	96	-0.069	0.108	0.084	0.0	97.9	0.0	0.0	0.0		
U024-u024	26 cm/s	24 h	94	-0.064	0.103	0.081	0.0	98.9	0.0	0.0	0.0		
U030-u030	26 cm/s	24 h	95	-0.074	0.115	0.088	0.0	96.8	0.0	0.0	0.0		
U036-u036	26 cm/s	24 h	93	-0.072	0.109	0.083	0.0	97.8	0.0	0.0	0.0		
U042-u042	26 cm/s	24 h	98	-0.075	0.113	0.085	0.0	98.0	0.0	0.0	0.0		
U048-u048	26 cm/s	24 h	92	-0.067	0.103	0.079	0.0	98.9	0.0	0.0	0.0		
AFC-afc	26 cm/s	24 h	175	-0.109	0.149	0.102	0.6	92.6	0.0	0.0	0.0		
AEC-aec	26 cm/s	24 h	202	-0.221	0.242	0.098	0.5	69.8	0.0	0.0	0.0		
TFC-tfc	0.50 h	25 h	175	-0.342	1.413	1.375	33.1	26.3	17.1	0.0	0.0		
TEC-tec	0.50 h	25 h	202	-0.621	1.237	1.073	39.6	27.7	6.9	49.5	0.0		

APPENDIX H: TIMES SERIES OF MODELED WATER CURRENT SPEED VERSUS OBSERVATIONS
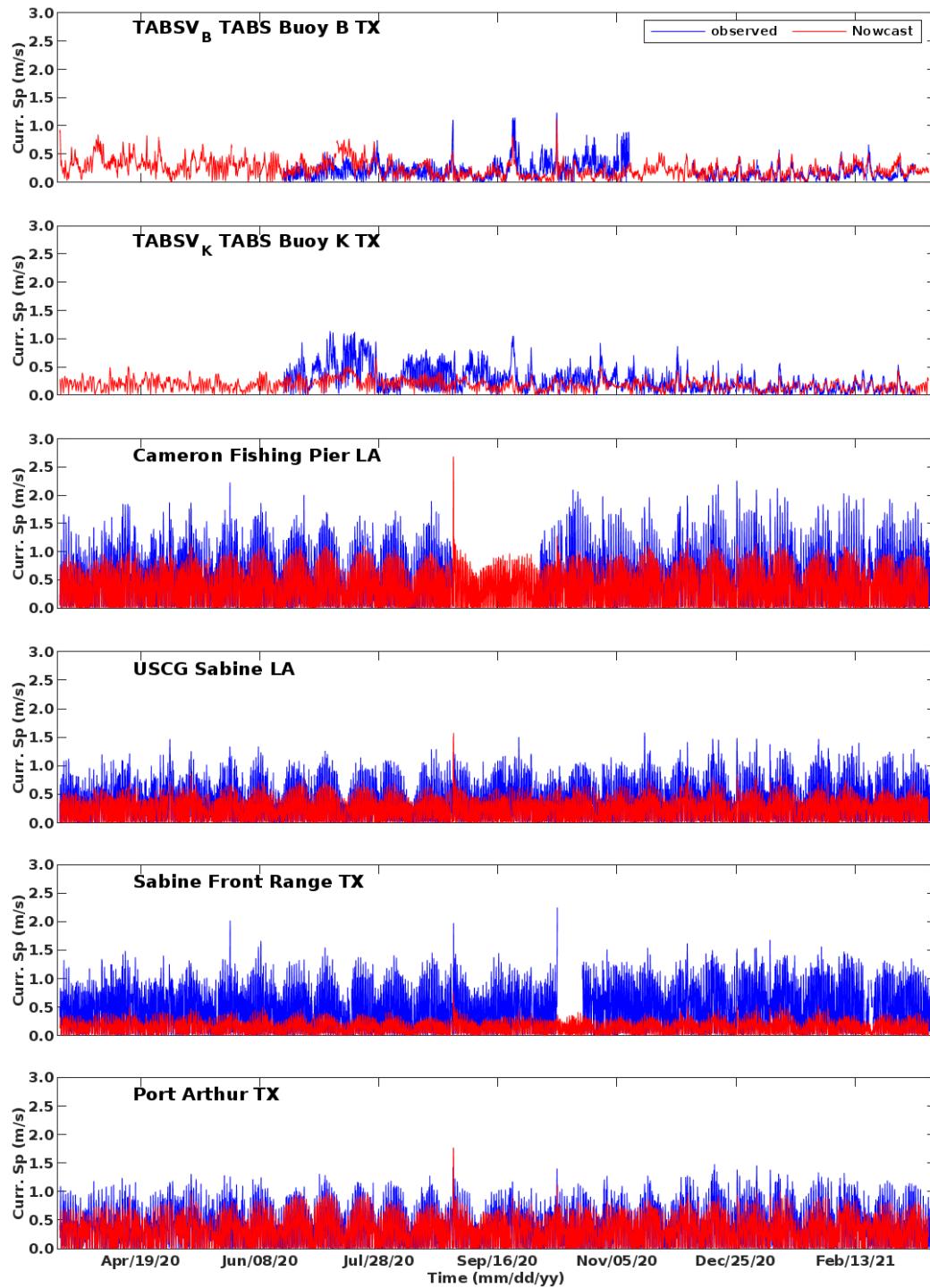

Figure H-1. Time series of modeled (red) versus observed (blue) water current speeds at stations (from upper to lower): TABS Buoy B, TX; TABS Buoy K, TX; Cameron Fishing Pier, LA; USCG Sabine, LA; Sabine Front Range, TX; and Port Arthur, TX.
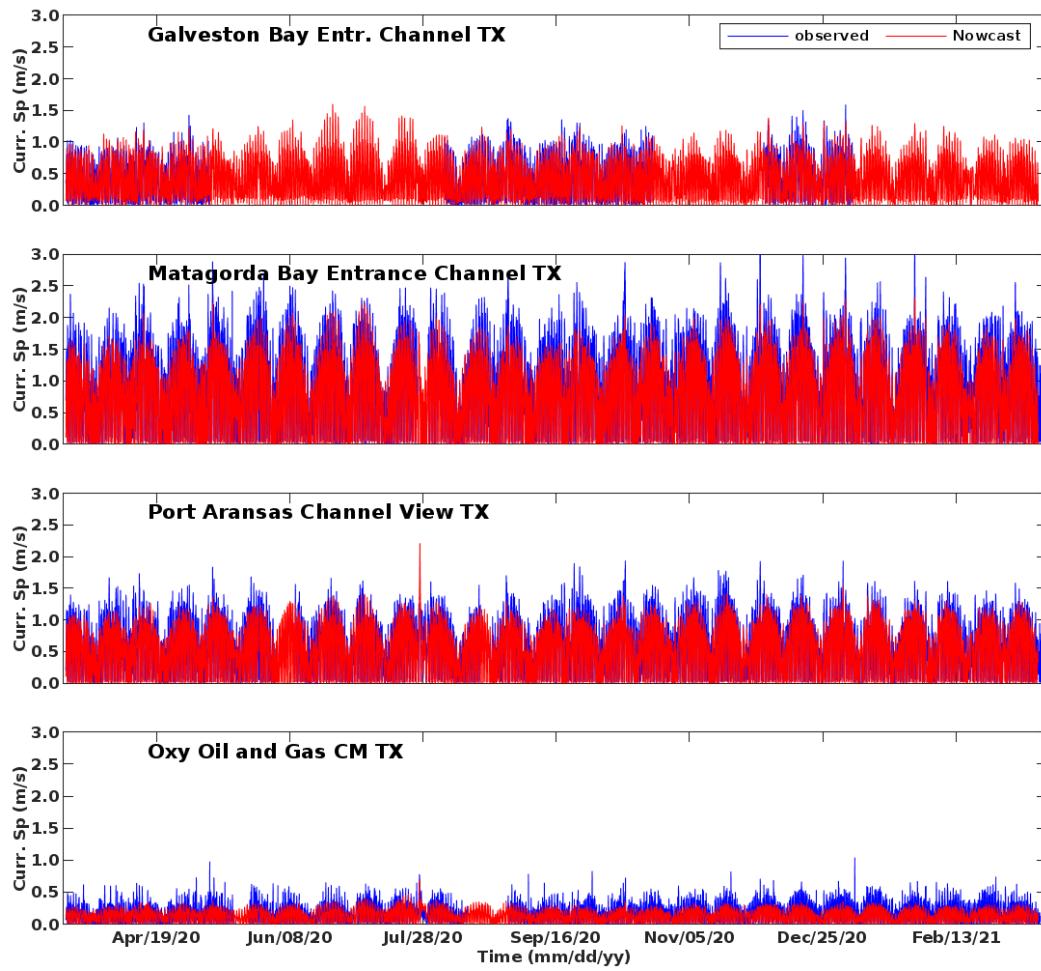
Figure H-2. Time series of modeled (red) versus observed (blue) water current speeds at stations (from upper to lower): Galveston Bay Entrance Channel, TX; Matagorda Bay Entrance Channel, TX; Port Aransas Channel View, TX; and Oxy Oil and Gas CM, TX.

ACRONYMS

ADCIRC	ADvanced CIRCulation model
CF	Central Frequency
COMF	Coastal Ocean Modeling Framework
CO-OPS	Center for Operational Oceanographic Products and Services
COARE	Coupled Ocean Atmosphere Response Experiment
CSDL	Coast Survey Development Lab
FVCOM	Finite Volume Community Ocean Model
GFS	Global Forecast System
G-RTOFS	Global Real-Time Ocean Forecast System
h	hour
HAB	Harmful Algal Bloom
HPC	High Performance Computing
Km	kilometer
NAM	North American Mesoscale Forecast System
NEGOFS	Northeastern Gulf of Mexico Operational Forecast System
NGOFS	Northern Gulf of Mexico Operational Forecast System
NGOFS2	Upgraded Northern Gulf of Mexico Operational Forecast System
NWGOFS	Northwestern Gulf of Mexico Operational Forecast System
m/s	meter per second
m	meter
MDPO	Maximum Duration of Positive Outliers
MDNO	Maximum Duration of Negative Outliers
NCEP	National Centers for Environmental Prediction
NDBC	National Data Buoy Center
N/F	Nowcast/Forecast
NOAA	National Oceanic and Atmospheric Administration
NOF	Negative Outlier Frequency
NOS	National Ocean Service
NWLON	National Water Level Observation Network
NWS	National Weather Service
OFS	Operational Forecast System
POF	Positive Outlier Frequency
POM	Princeton Ocean Model
PORTS	Physical Oceanographic Real-Time System
PSU	Practical Salinity Unit
RMSE	Root Mean Square Error
SM	Series Mean
SVD	Singular Value Decomposition
USCG	U.S. Coast Guard
USGS	U.S. Geological Survey
WCOSS	Weather and Climate Operational Supercomputing System