CO-OPS Storm Summary of the April 29-30 2014 North Central Gulf Coast Event

On April 29, a slow moving cold front produced historical rainfall over the Mobile and Pensacola regions, as a result of two rounds of strong storms overnight on April 28 - 29 (Figure 1, left) and overnight on April 29 - 30 (Figure 1, right). The latter produced greater rainfall totals than the previous storm, at 10-15" over about 9 hours, according to preliminary NWS findings. As a result, widespread flooding caused major damage throughout the area. Calendar day rainfall totals broke records at Mobile and Pensacola airports on April 29, as reported by NWS, of 11.24" and 15.55", respectively. The two day rainfall total at Pensacola was 20.47". See the preliminary NWS report posted by the Mobile/Pensacola Weather Forecast Office.

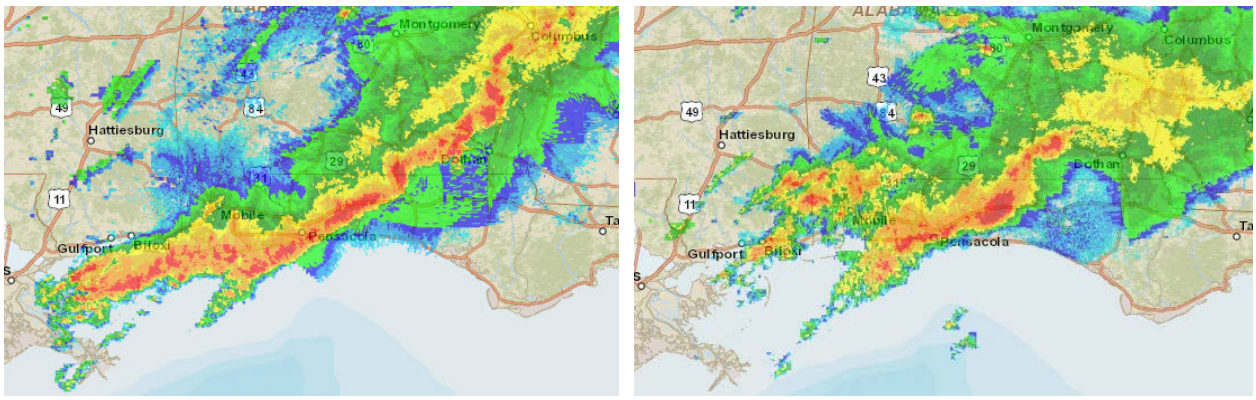


Figure 1. Radar mosaic, courtesy of Iowa Environmental Mesonet (IEM), via the National Climatic Data Center. Left: 4/29/14 9:30 GMT, Right: 4/30/14 03:30 GMT.

The NOS/CO-OPS water level stations located along the Alabama coast and the western Florida panhandle measured elevated water levels resulting from surface runoff as well as storm surge effects from the frontal passage. Several CO-OPS stations in Mobile Bay recorded water levels of about two feet above tidal predictions (astronomical tide).

As seen in Table 1 (and Figure 2), Weeks Bay, AL measured the highest storm tide at 4.33 ft above MLLW (2.75 ft above MHHW), and the highest storm surge of 3.41 ft. Coast Guard Sector Mobile, AL, which is about 3 miles south of Mobile, measured the second highest water levels, at 3.82 ft above MLLW (2.2 ft above MHHW), and Chickasaw Creek, AL measured 3.76 ft above MLLW (2.09 ft above MHHW). Weeks Bay and Chickasaw Creek are located on Fish River, and Tensaw River, respectively, and therefore were likely affected mostly by surface runoff. A USGS river gage, located on Chickasaw Creek about 3 miles upstream from the CO-OPS station, also measured a sharp 13-ft increase in gage height (Figure 3). None of these stations' data exceeded historical maximum water levels, but Weeks Bay did come within 0.07 ft of the maximum measured in 2012 (2.82 ft above MHHW), over the seven-year period of record.

The Pensacola water level station is located in the region that received the most rainfall. Water levels began rising the day before due to prolonged southerly flow pushing water towards the shore. However, the storm was not severe enough to cause extreme elevated water levels due to wind-driven waters, and because of its location on an open area of Pensacola Bay rather than a river, it was not affected by runoff as much as Weeks Bay or Chickasaw Creek (Figure 4).

Station	Station Name	Maximum Storm Tide Date & Time (GMT)	Storm Tide (ft, MHHW)	Predicted (ft, MHHW)	Storm Tide (ft, MLLW)	Predicted (ft, MLLW)	Maximum Storm Surge Date & Time (GMT)	Maximum Storm Surge (ft)	Historical Maximum Water Level Date & Time (GMT)	Historical Maximum Water Level (ft, MHHW)	Station Installation date
8729210	Panama City Beach, FL	4/30/2014 15:06	1.52	0.03	2.9	1.41	4/29/2014 19:30	1.8	10/04/1995 23:12	6.84	9/18/1989
8729840	Pensacola, FL	4/30/2014 15:48	1.72	0.23	2.97	1.49	4/30/2014 4:18	2.33	09/18/1926 12:00	7.41	4/30/1923
8732828	Weeks Bay, AL	4/30/2014 12:18	2.75	-0.53	4.33	1.05	4/30/2014 10:54	3.41	08/29/2012 16:18	2.82	8/23/2007
8735180	Dauphin Island, AL	4/29/2014 18:00	1.46	-0.1	2.66	1.1	4/30/2014 6:24	2.21	09/16/2004 04:06	5.94	03/30/1966
8735391	Dog River Bridge, AL	4/29/2014 18:36	1.7	-0.21	3.28	1.37	4/30/2014 6:42	2.45	08/29/2012 17:18	3.64	06/01/2011
8735523	East Fowl River Bridge, AL	4/29/2014 19:54	1.75	-0.26	3.13	1.13	4/30/2014 3:18	2.38	08/29/2012 16:30	3.72	06/01/2011
8736897	Coast Guard Sector Mobile, AL	4/29/2014 18:48	2.2	-0.15	3.82	1.46	4/30/2014 7:06	2.6	09/01/2008 18:00	3.8	08/3/2007
8737048	Mobile State Docks, AL	4/29 2014 19:00	2.08	0.00	3.67	1.61	4/30/2014 7:30	2.45	08/29/2012	3.67	3/24/1980
8737138	Chickasaw Creek, AL	4/29/2014 20:00	2.09	-0.17	3.76	1.5	4/30/2014 2:00	2.77	N/A	N/A	11/21/2011
8738043	West Fowl River Bridge, AL	4/29/2014 17:06	1.61	-0.15	3.22	1.46	4/30/2014 6:36	2.41	08/29/2012 14:30	3.36	06/01/2011
8739803	Bayou La Batre Bridge, AL	4/29/2014 16:18	1.88	-0.01	3.49	1.6	4/30/2014 5:06	2.63	N/A	N/A	11/17/2011

Table 1. Maximum recorded water levels in geographic order (by Station ID) referenced to Mean Higher High Water (MHHW) and Mean Lower Low Water (MLLW). Storm tide is the total observed water level. Storm surge is the difference between total water level and tidal predictions. None of these data exceeded historical maximum water levels.

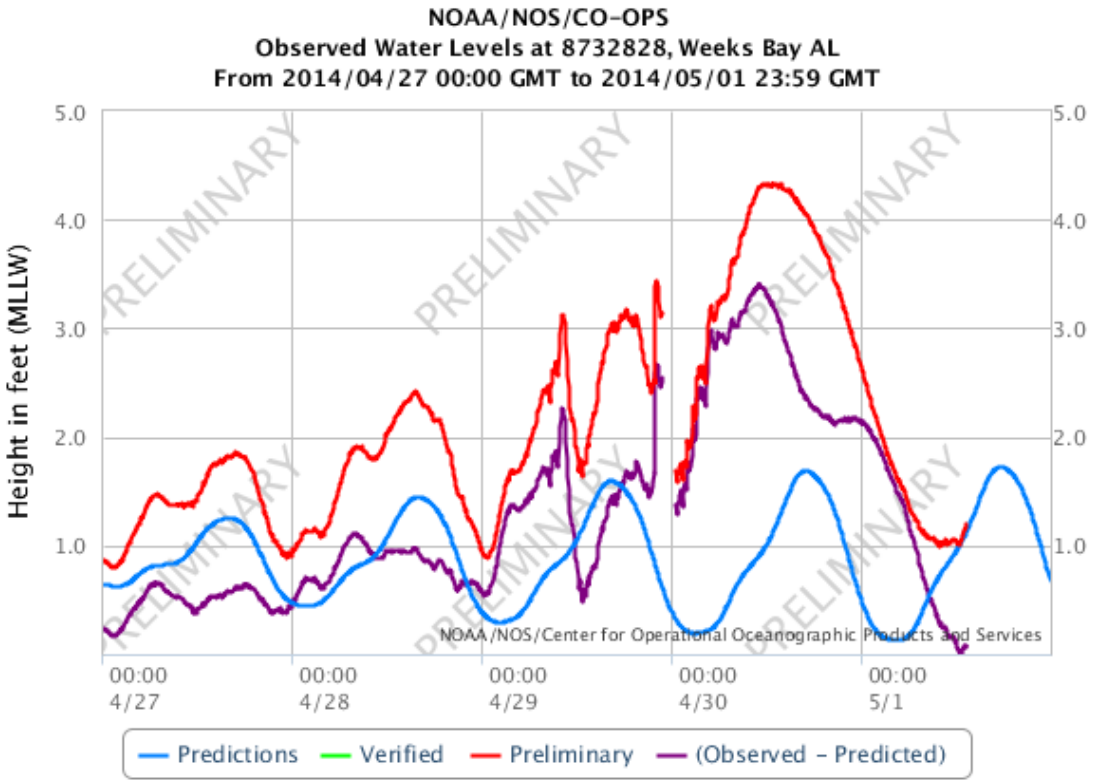


Figure 2. Weeks Bay, AL observed water levels

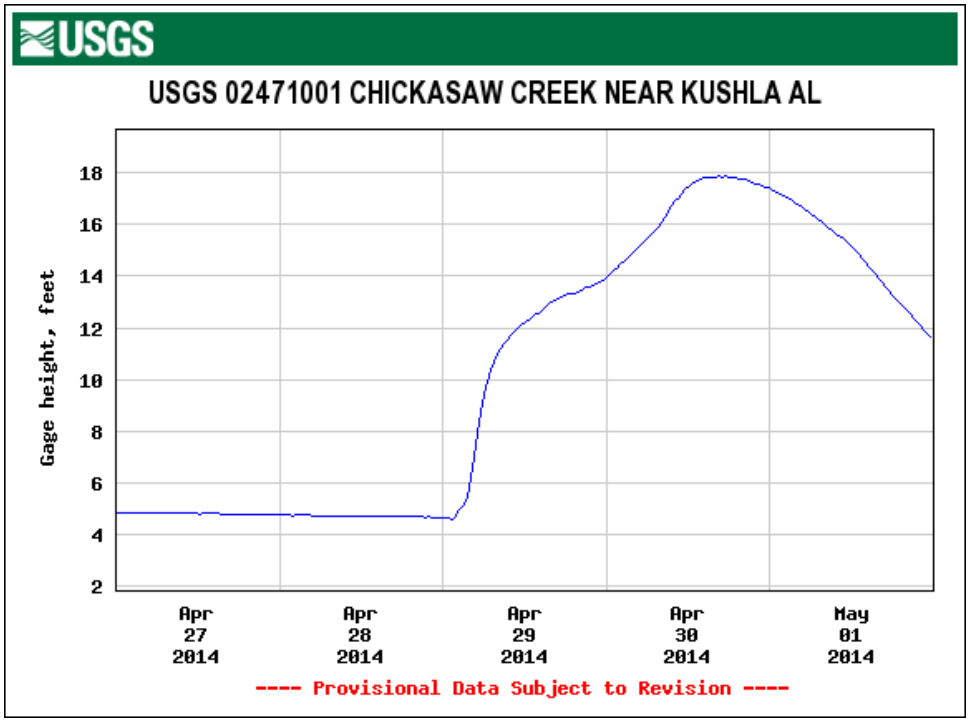
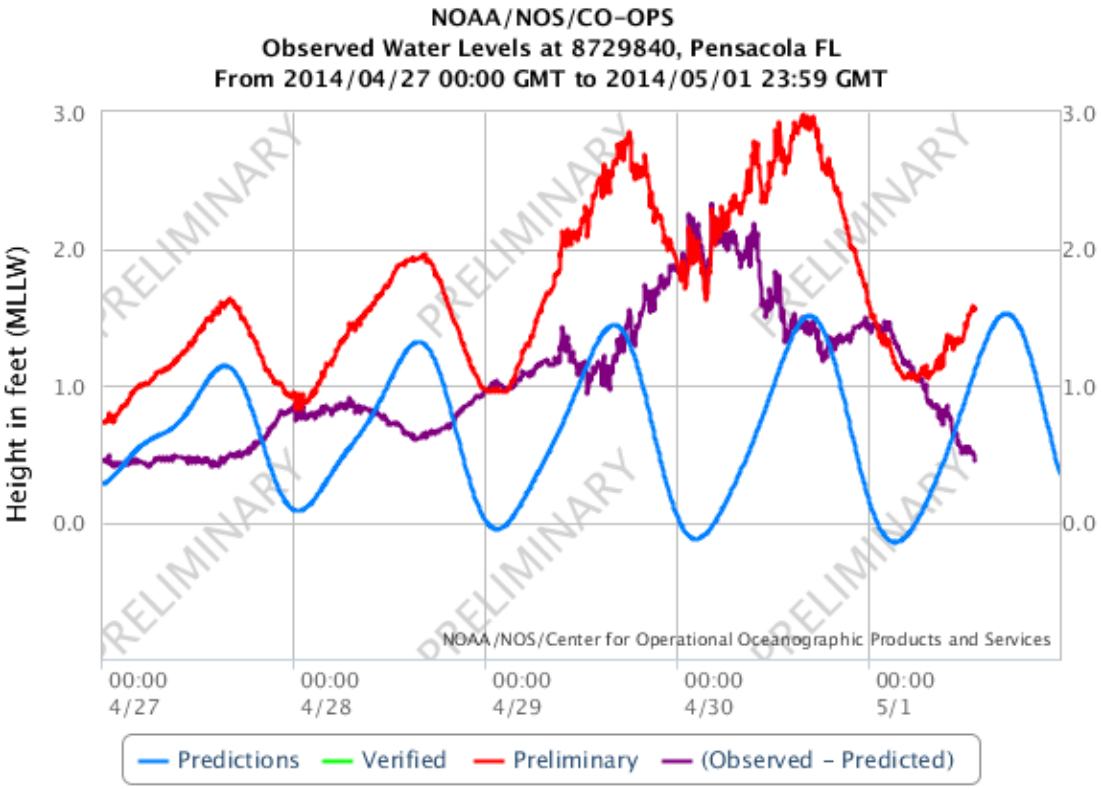


Figure 3. USGS river gage at Chickasaw Creek, AL, about 3 mi upstream of the CO-OPS Chickasaw Creek station (8737138), measured a sudden increase in river levels. At the time that this station's river levels rose (~18:30 GMT), the water levels at 8737138 were only about 2.0 to 2.5 ft above MLLW.



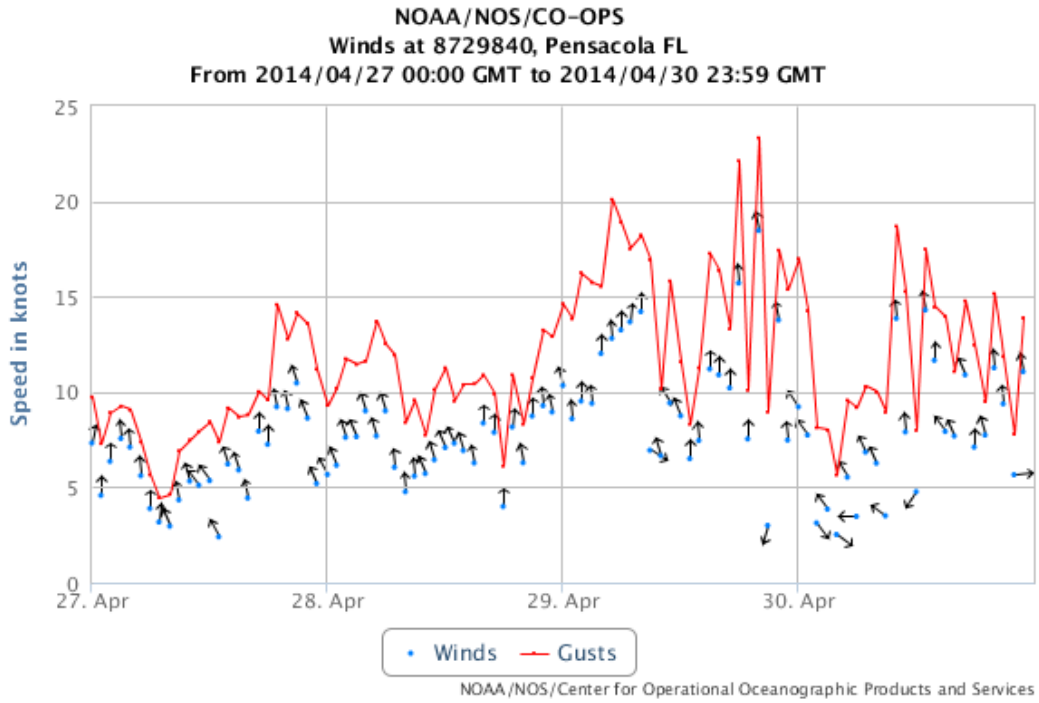


Figure 4. Pensacola, FL observed water level and winds.