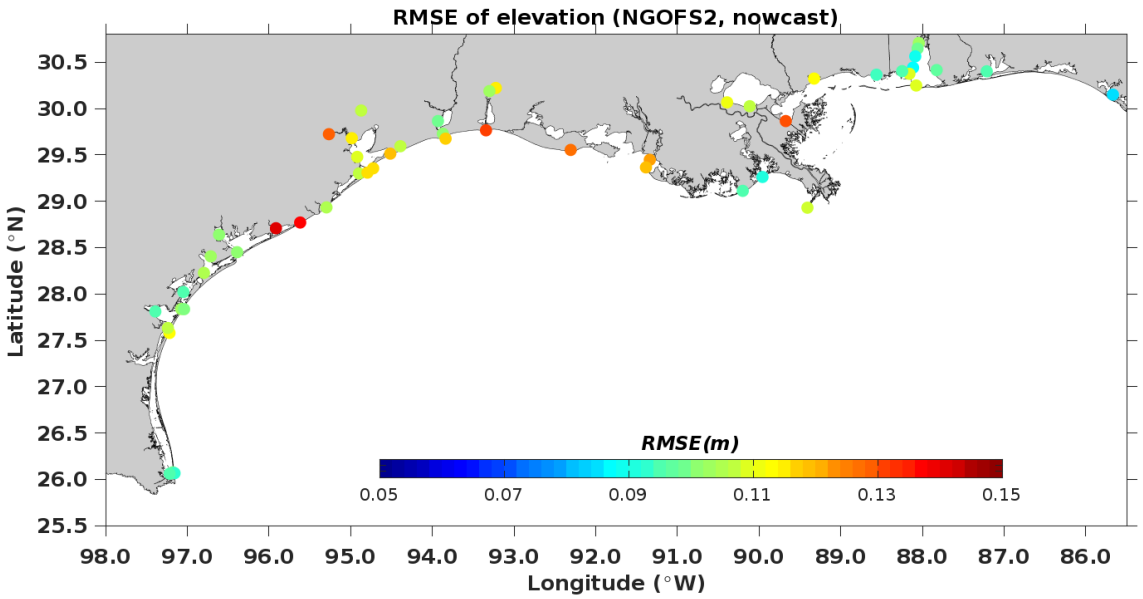
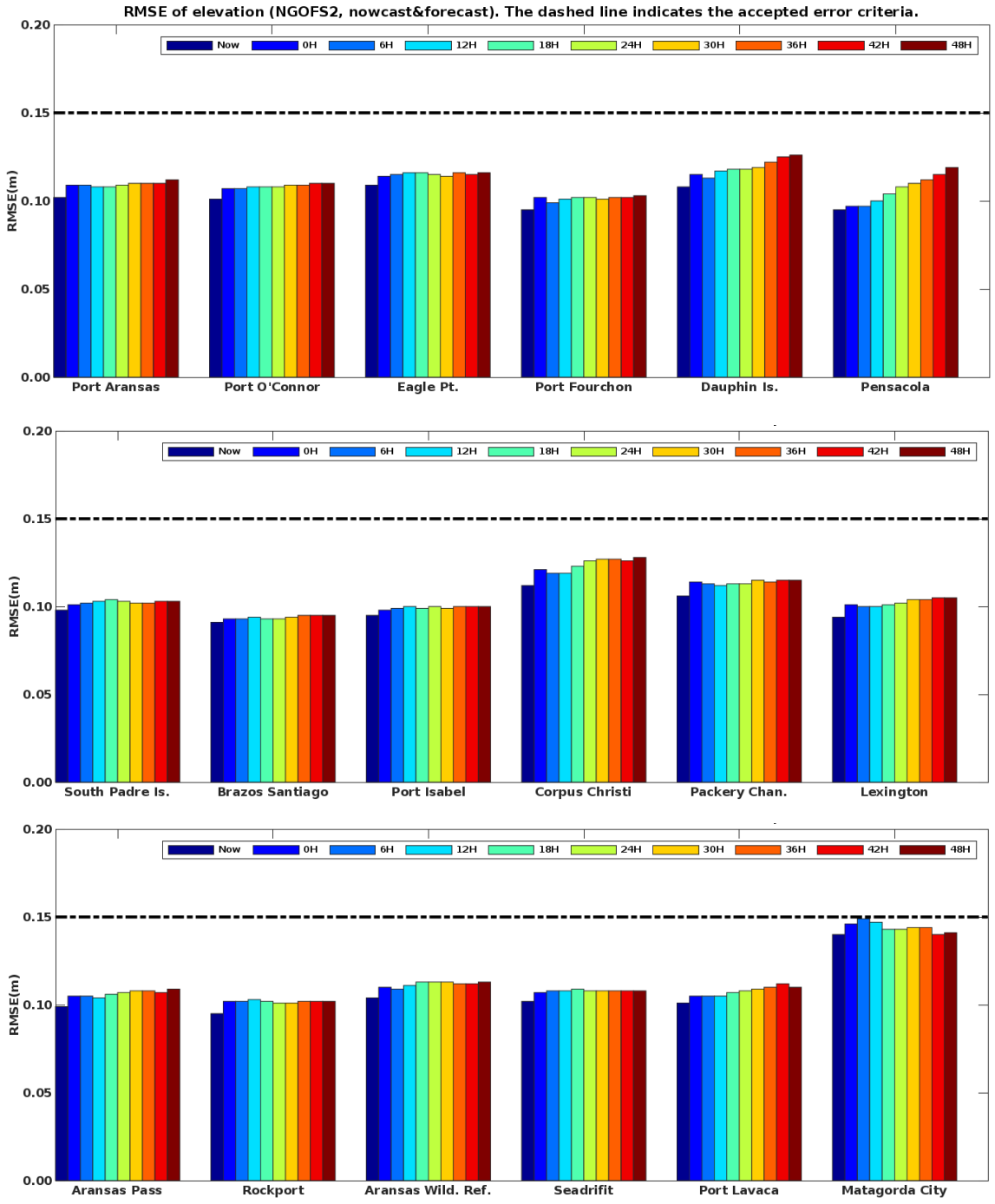
The upgraded Northern Gulf of Mexico Operational Forecast System (NGOFS2) uses the Finite Volume Community Ocean Model (FVCOM), developed by University of Massachusetts at Dartmouth, as its core hydrodynamic model. NGOFS2 model domain combines the previous Northern Gulf of Mexico (NGOFS), Northeastern Gulf of Mexico (NEGOFS) and Northwestern Gulf of Mexico (NWGOFS), and extends into the Mississippi River up to Baton Rouge, Lake Pontchartrain, Barataria Bay, the Corpus Christi Bay intracoastal waterways, and along about 450 km Mexican coast. It became operational in March 2021 to provide nowcast and forecast guidance of water levels, currents, water temperature and salinity four times per day. CO-OPS produced NGOFS2 uncertainty estimates by running NOS standard skill assessment tools (Hess et al., 2003; Zhang et al. 2009) from NGOFS2 quasi-operational run output. The accepted error criteria for skill assessment are 0.15 m for water level, 0.26 m/s for current speed, 22.5 degree for current direction, 3.0 °C for water temperature, and 3.5 psu for water salinity.

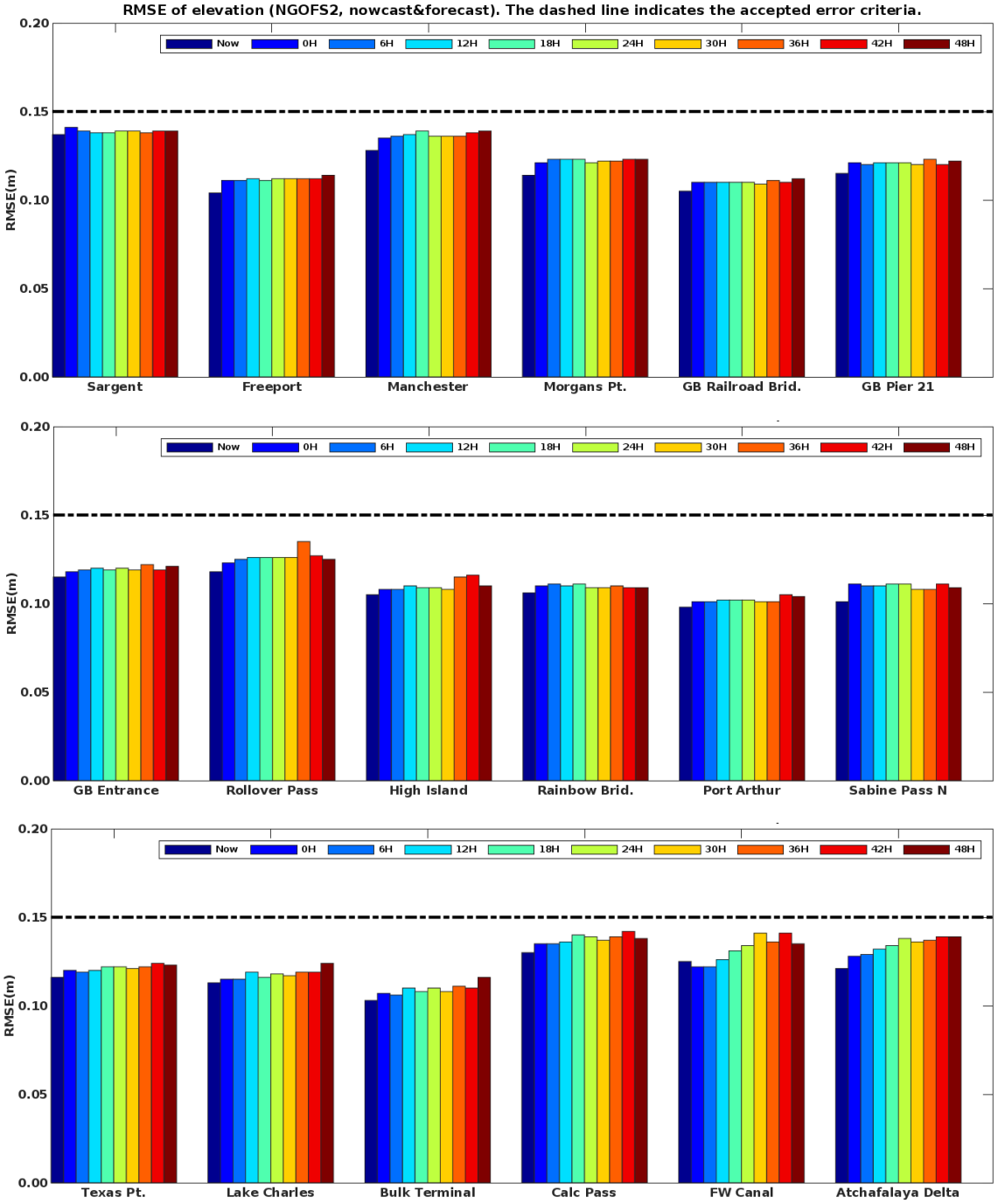
The figures below show the Root Mean Square Error (RMSE) of the NGOFS2 water levels, currents, water temperature, and salinity of the quasi-operational nowcast and forecast runs from 1/1/2020 through 12/31/2020. (It should be noted that in 2020, the Hurricanes Hannah, Laura, Sally, and Zeta and tropical storms Cristobal, Marco, Beta, and Delta made landfall in NGOFS2 model domain coastline.). More details about NGOFS2 are described in NOAA Technical Report (xxxx).

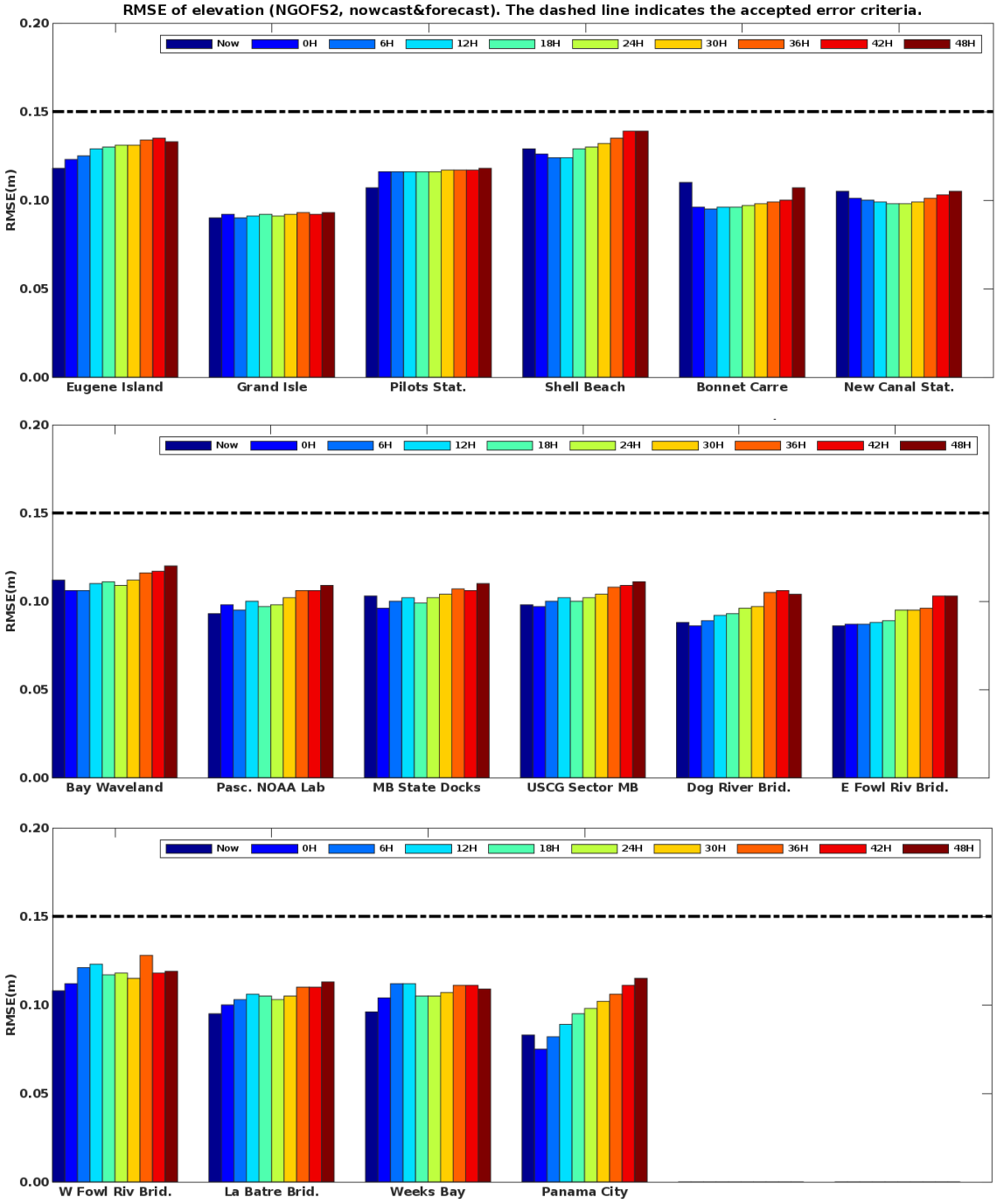
Nowcast Water Level



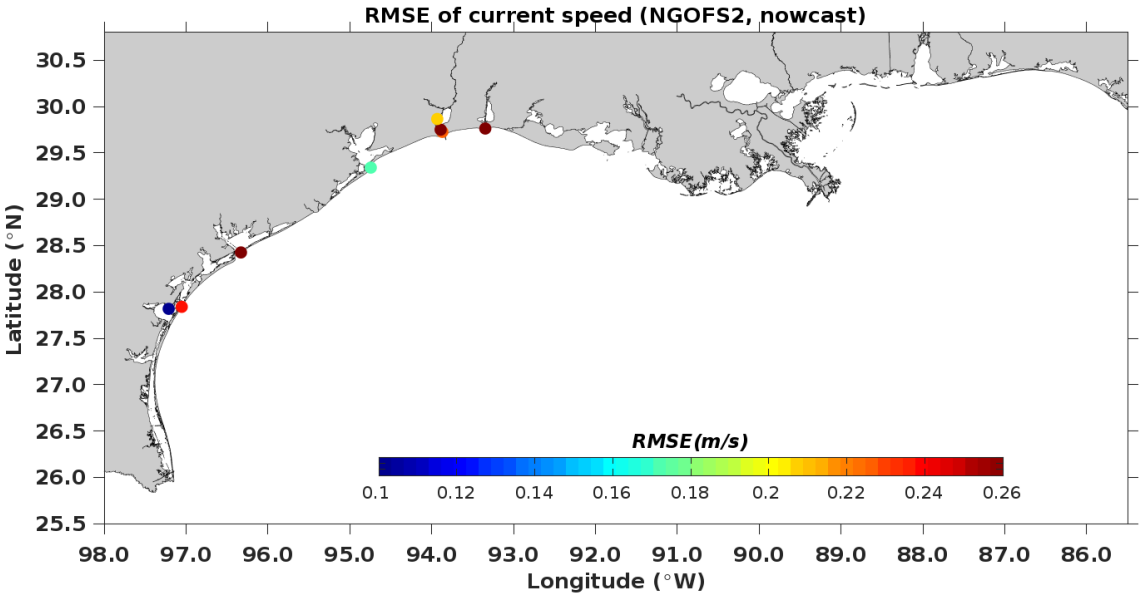
Nowcast and Forecast Water Level



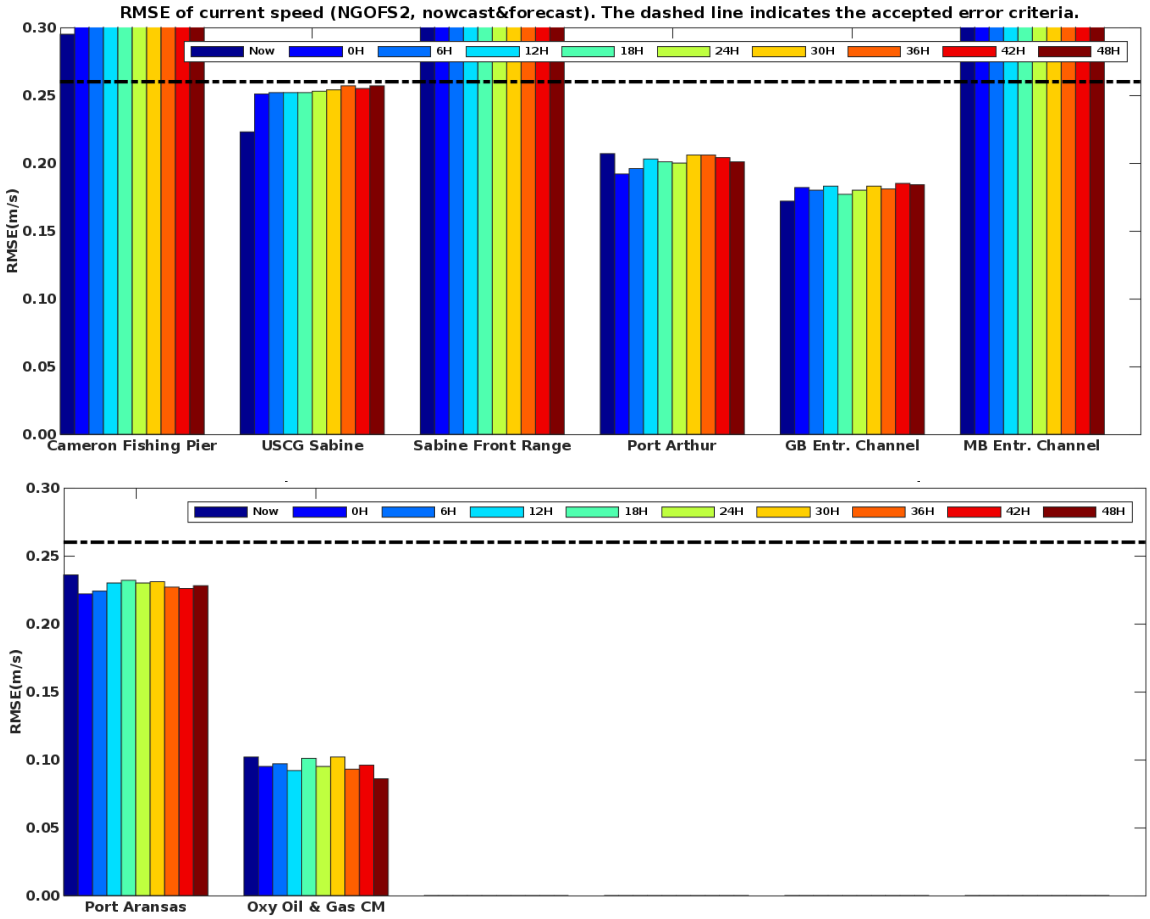

RMSE of elevation (NGOFS2, nowcast&forecast). The dashed line indicates the accepted error criteria.
Now
0H
6H
12H
18H
24H
30H
36H
42H
48H
RMSE(m)
0.20
0.15
0.10
0.05
0.00
Sargent
Freeport
Manchester
Morgans Pt.
GB Railroad Brid.
GB Pier 21
GB Entrance
Rollover Pass
High Island
Rainbow Brid.
Port Arthur
Sabine Pass N
Texas Pt.
Lake Charles
Bulk Terminal
Calc Pass
FW Canal
Atchafalaya Delta


RMSE of elevation (NGOFS2, nowcast&forecast). The dashed line indicates the accepted error criteria.
Now
0H
6H
12H
18H
24H
30H
36H
42H
48H
RMSE(m)
0.20
0.15
0.10
0.05
0.00
Eugene Island
Grand Isle
Pilots Stat.
Shell Beach
Bonnet Carre
New Canal Stat.
Bay Waveland
Pasc. NOAA Lab
MB State Docks
USCG Sector MB
Dog River Brid.
E Fowl Riv Brid.
W Fowl Riv Brid.
La Batre Brid.
Weeks Bay
Panama City

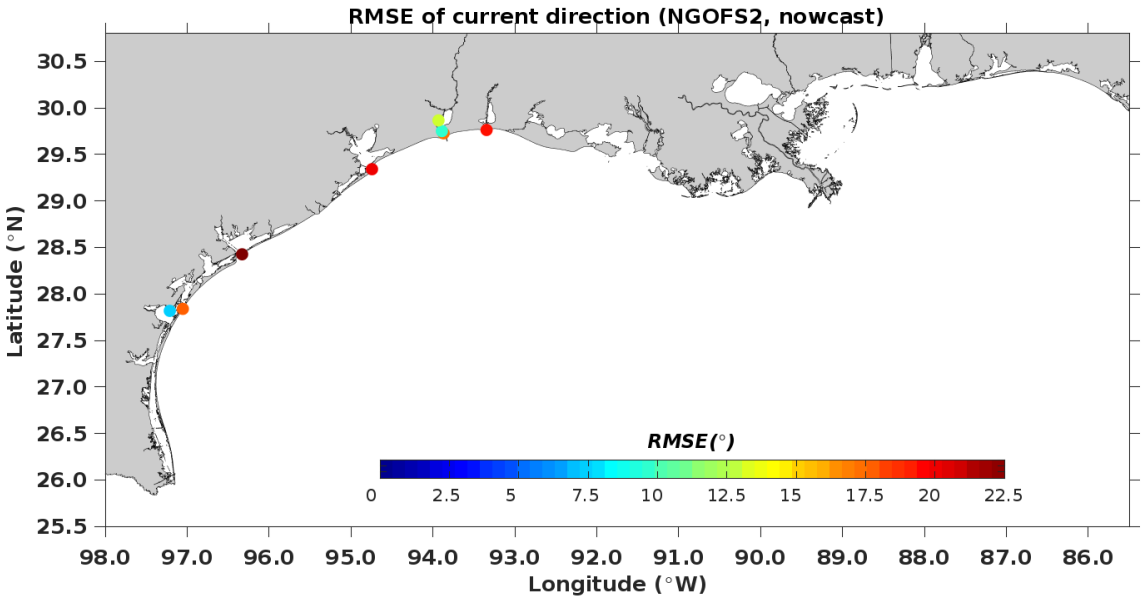
Nowcast Surface Current Speed



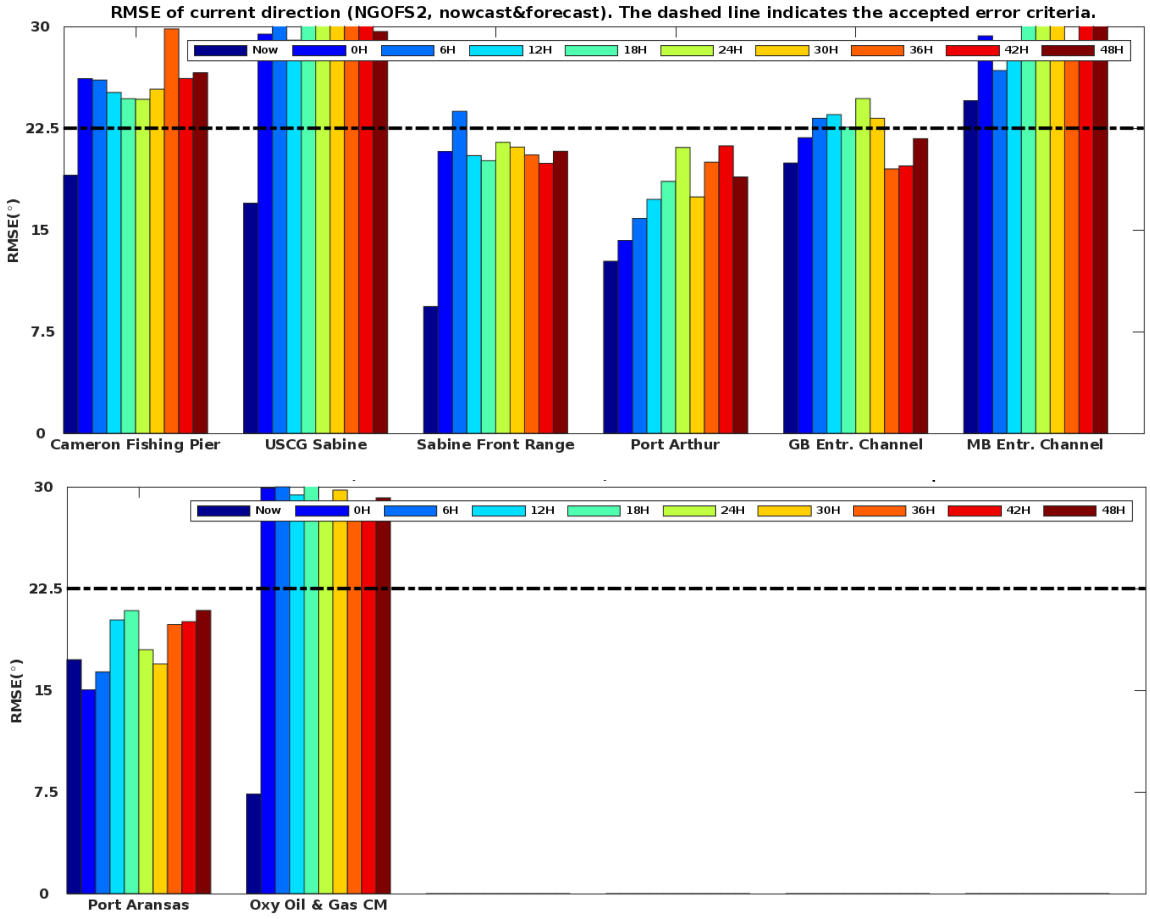
Nowcast and Forecast Surface Current Speed



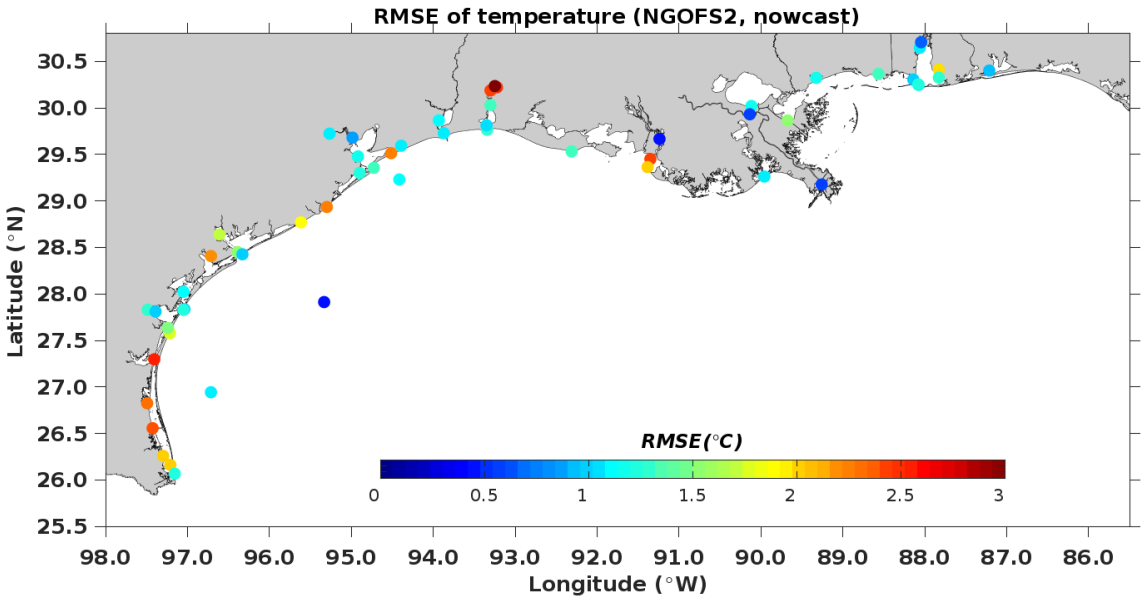
Nowcast Surface Current Direction



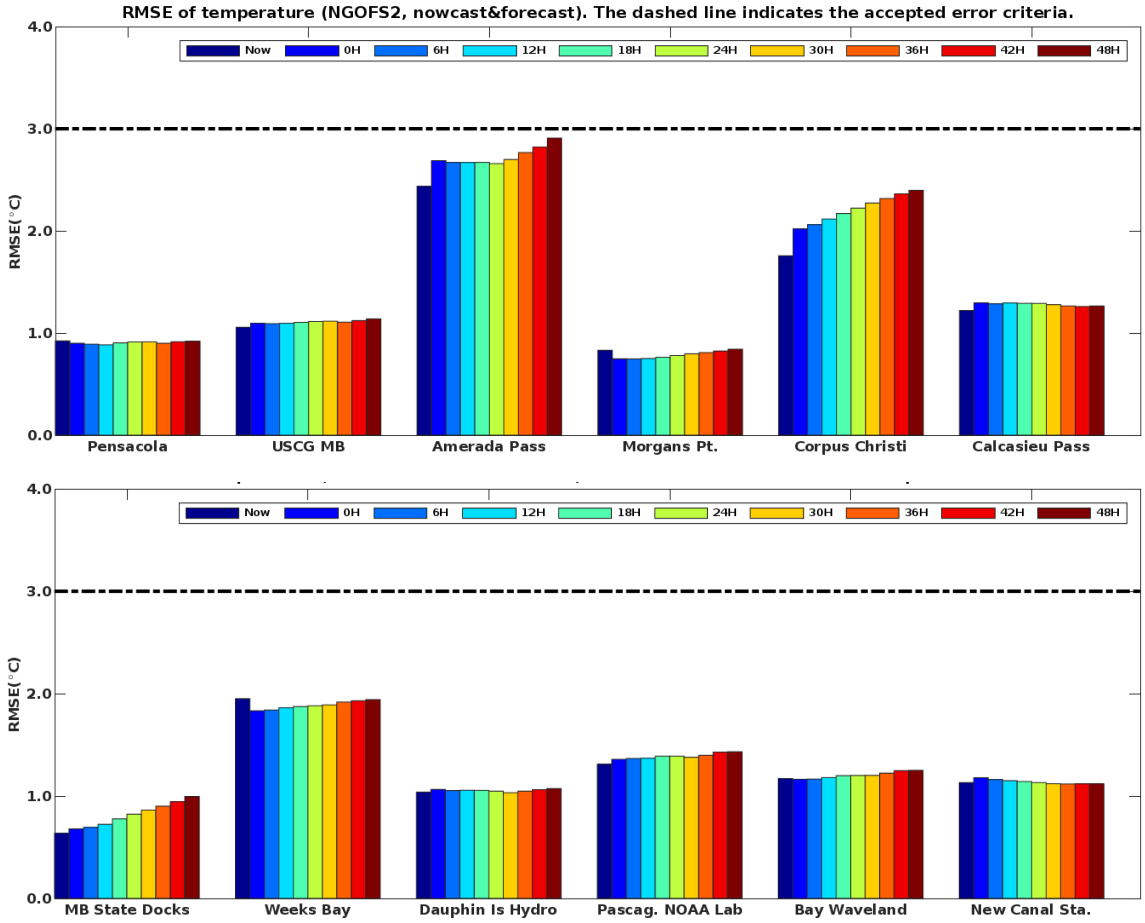
Nowcast and Forecast Current Direction

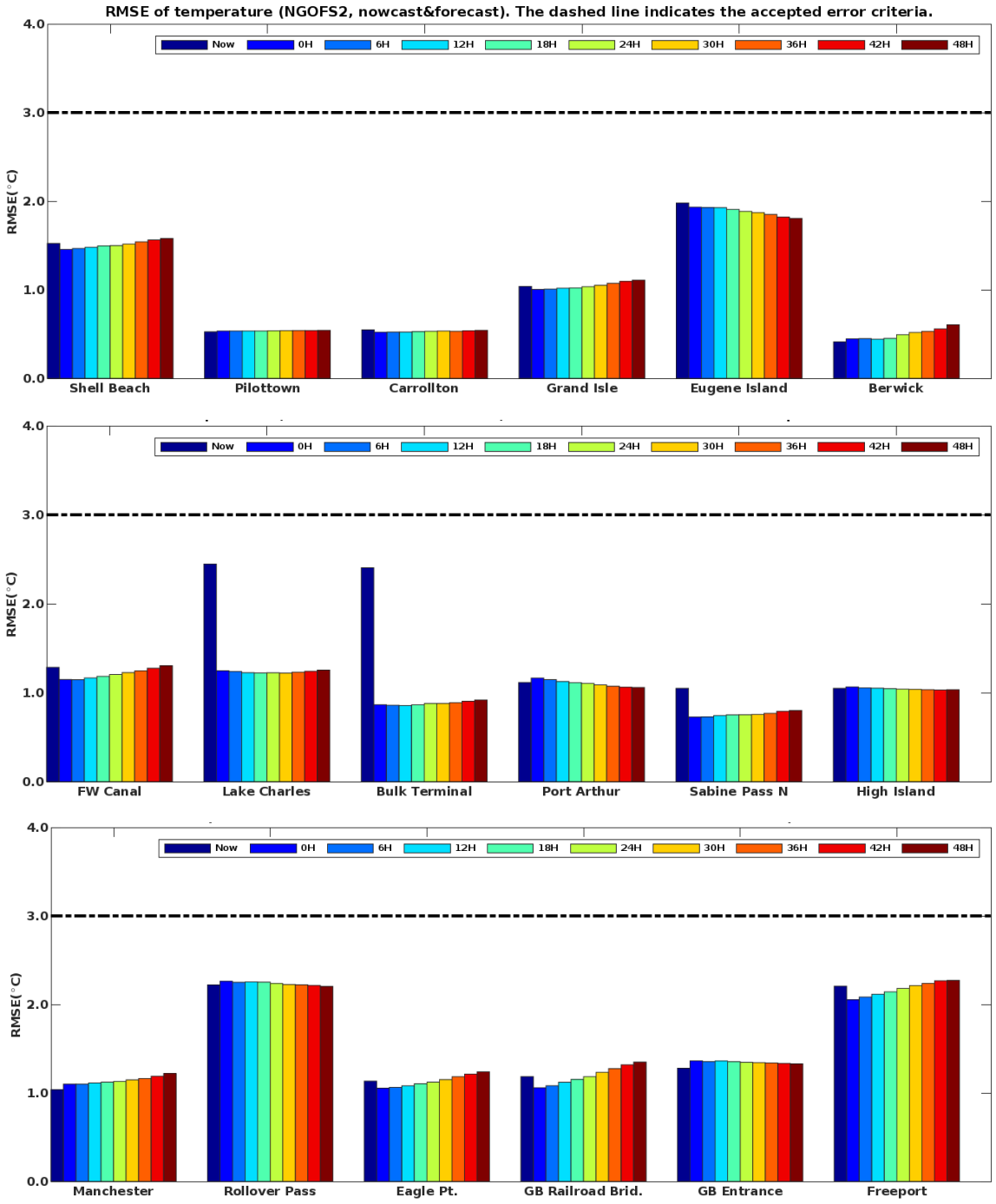


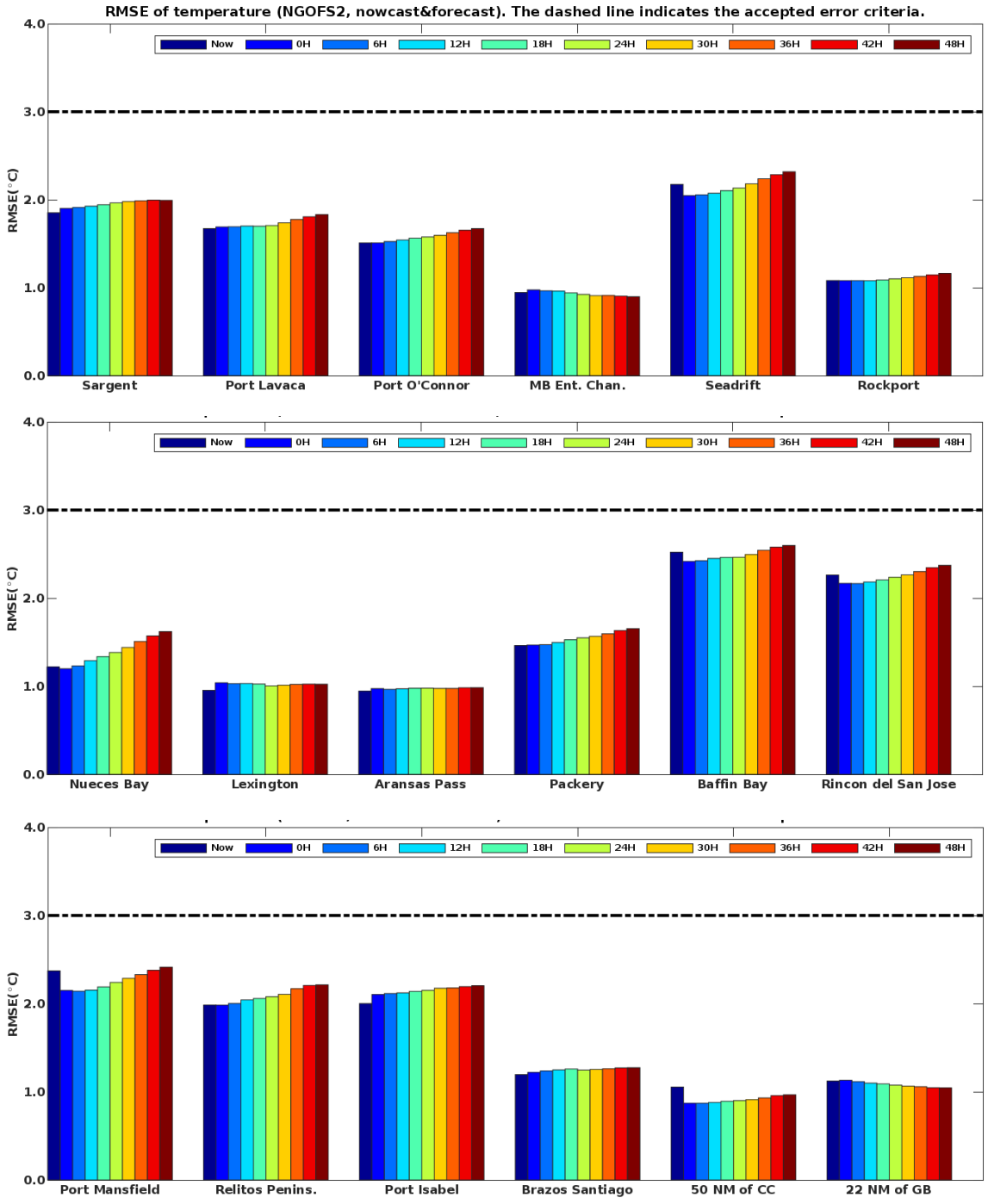
Nowcast Surface Water Temperature

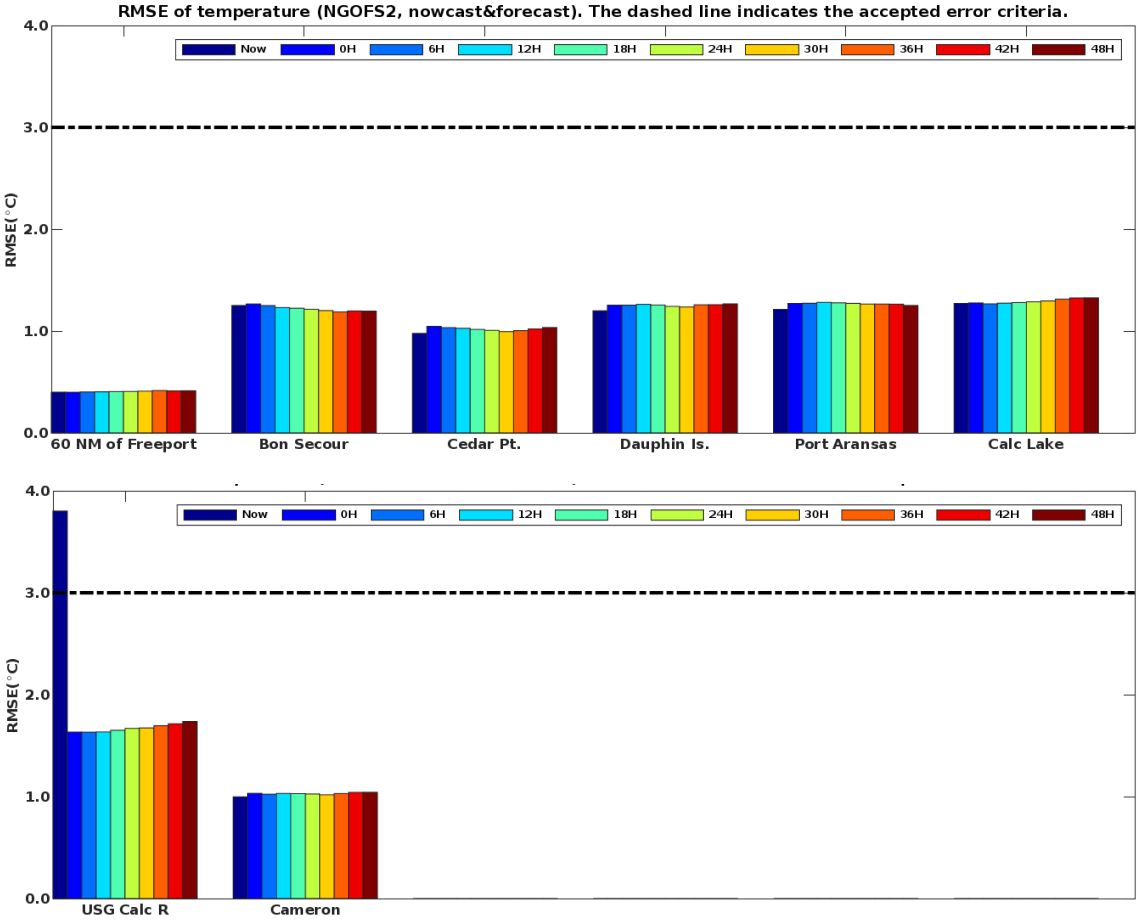


Nowcast and Forecast Surface Water Temperature

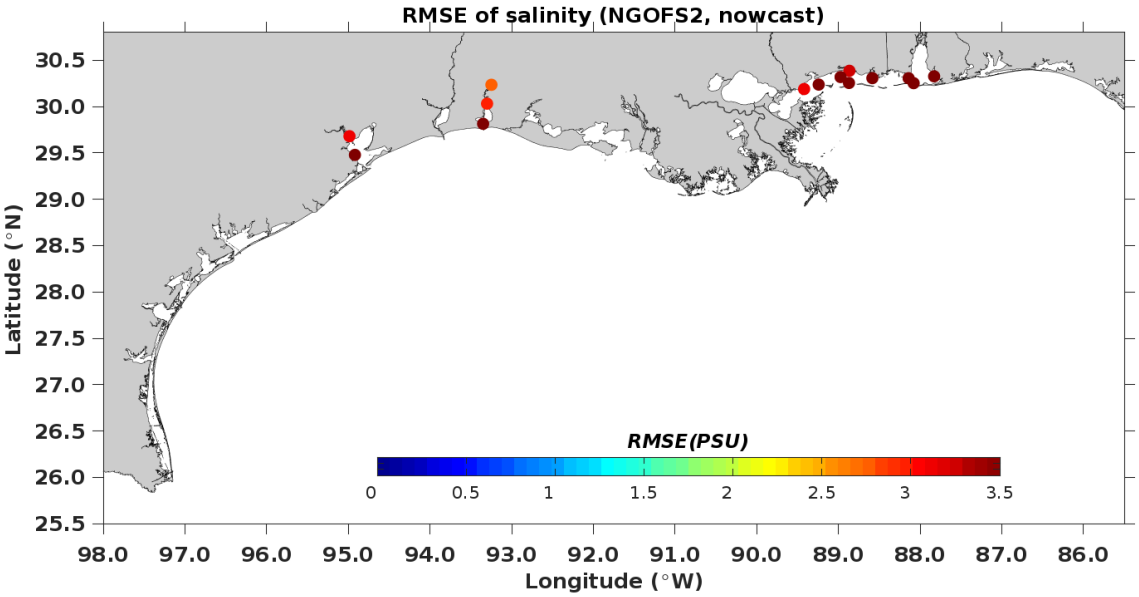



RMSE of temperature (NGOFS2, nowcast&forecast). The dashed line indicates the accepted error criteria.
Now
0H
6H
12H
18H
24H
30H
36H
42H
48H
RMSE(°C)
4.0
3.0
2.0
1.0
0.0
Shell Beach
Pilottown
Carrollton
Grand Isle
Eugene Island
Berwick
FW Canal
Lake Charles
Bulk Terminal
Port Arthur
Sabine Pass N
High Island
Manchester
Rollover Pass
Eagle Pt.
GB Railroad Brid.
GB Entrance
Freeport

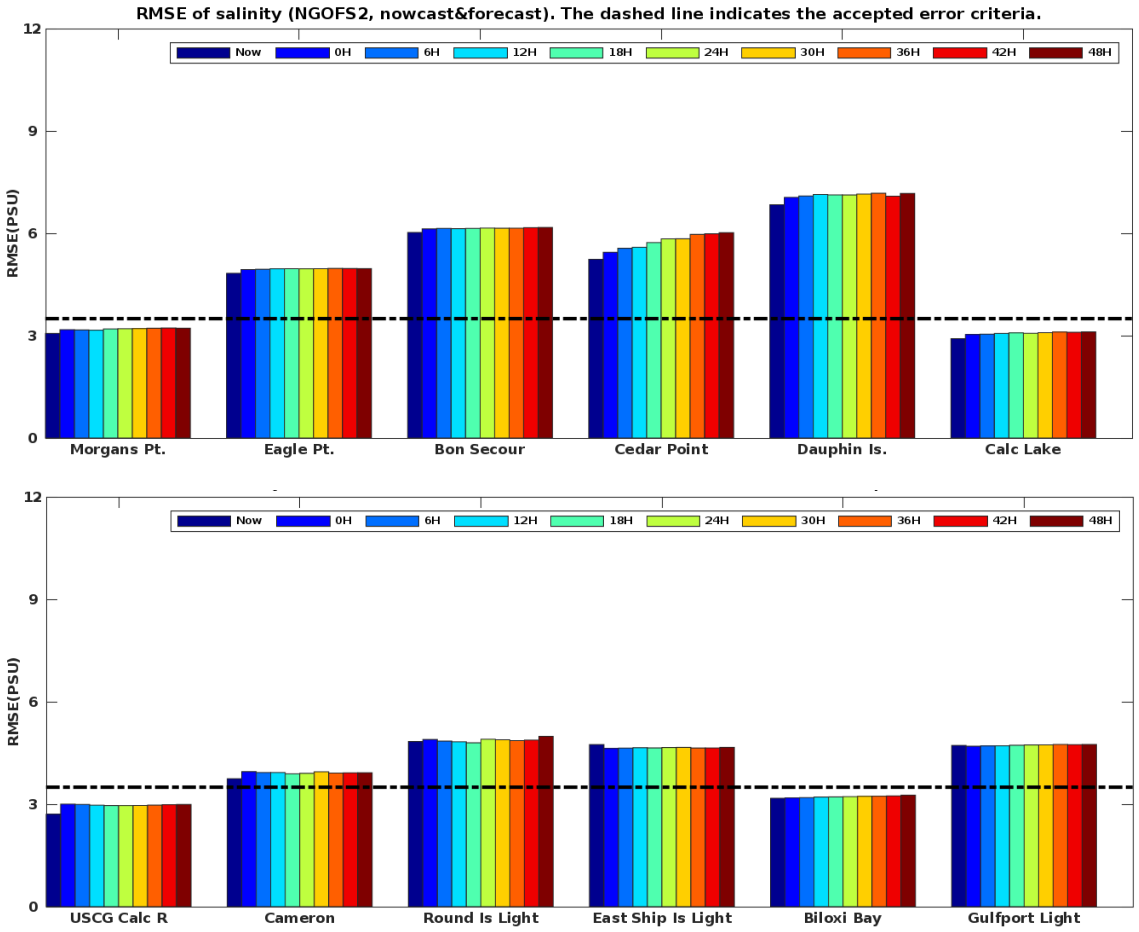

RMSE of temperature (NGOFS2, nowcast&forecast). The dashed line indicates the accepted error criteria.
Now
0H
6H
12H
18H
24H
30H
36H
42H
48H
RMSE(°C)
4.0
3.0
2.0
1.0
0.0
Sargent
Port Lavaca
Port O'Connor
MB Ent. Chan.
Seadrift
Rockport
Nueces Bay
Lexington
Aransas Pass
Packery
Baffin Bay
Rincon del San Jose
Port Mansfield
Relitos Penins.
Port Isabel
Brazos Santiago
50 NM of CC
22 NM of GB


RMSE of temperature (NGOFS2, nowcast&forecast). The dashed line indicates the accepted error criteria.
Now
0H
6H
12H
18H
24H
30H
36H
42H
48H
RMSE(°C)
4.0
3.0
2.0
1.0
0.0
60 NM of Freeport
Bon Secour
Cedar Pt.
Dauphin Is.
Port Aransas
Calc Lake
USG Calc R
Cameron

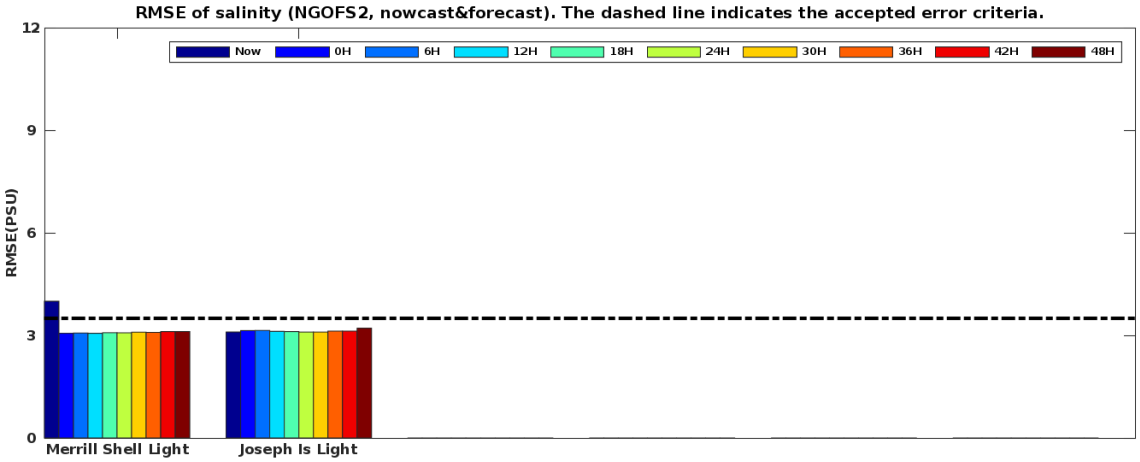
Nowcast Surface Water Salinity



Nowcast and Forecast Surface Water Salinity



Nowcast and Forecast Surface Water Salinity (continued)



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Hess, K.W., T.F. Gross, R.A. Schmalz, J.G.W. Kelley, F. Aikman, F. Wei, and M.S. Vincent, 2003. NOS Standards for Evaluating Operational Nowcast and Forecast Hydrodynamic Model Systems. NOAA Technical Report *NOS CS 17*, National Oceanic and Atmospheric Administration: Silver Spring, MD, USA.

Zhang, A., K. Hess, E. Wei, and E. Myers, 2009. Implementation of model skill assessment software for water level and current in tidal regions, NOAA Technical Report, *NOS CS 24*, National Oceanic and Atmospheric Administration: Silver Spring, MD, USA.