

Comparative Verification of Water Level Guidance Forecasts for the Middle Texas Coast

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Coastal Flooding Impacts

- Spring/Fall peak
- Usually lasts several days
- Restricted beach access
- Flooding of roads/property
- Businesses affected
- Economy/Tourism \$\$



Sandfest 2016
Thursday, April 28th, 2016

High Risk for Rip Currents Today
Coastal Flood Advisory in effect through Midnight Tonight



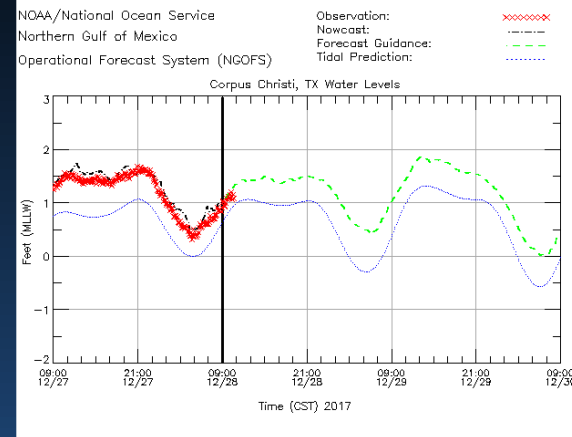
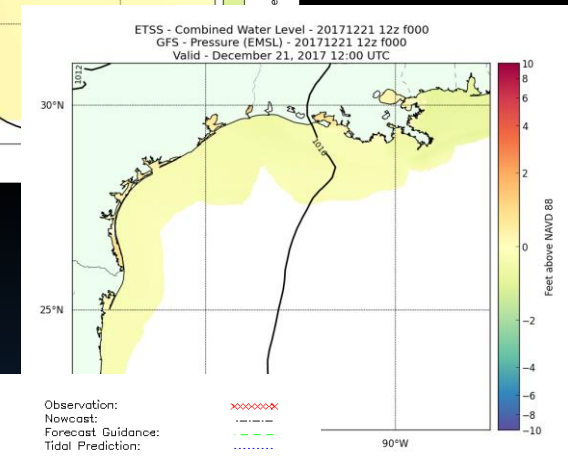
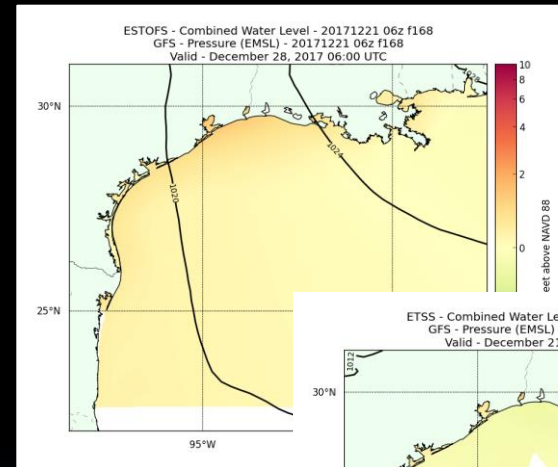
Water up to the Dunes



How “accurate” are NWP water level forecasts during coastal flooding events along the Middle TX Coast?

ESTOFS, ETSS, NGOFS

- **Extratropical Surge and Tide Operational Forecast System**
 - ADCIRC
 - 4 runs/day thru 180 h
- **ExtraTropical Storm Surge model**
 - SLOSH
 - 4 runs/day thru 96 h
- **Northern Gulf of Mexico Operational Forecast System**
 - FVCOM
 - 4 runs/day thru 54 h



Study parameters

- *07/01/2015 – 06/30/2017*

- Surge + Tide

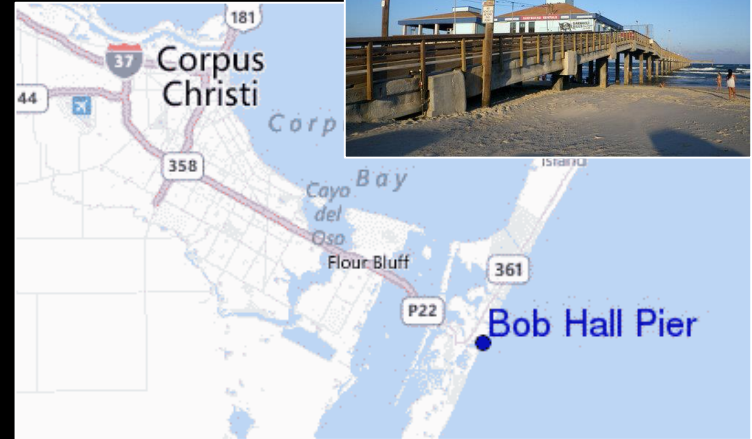
- Bob Hall Pier (NWLON)

- Coastal Flooding events (≥ 2 ft MSL)

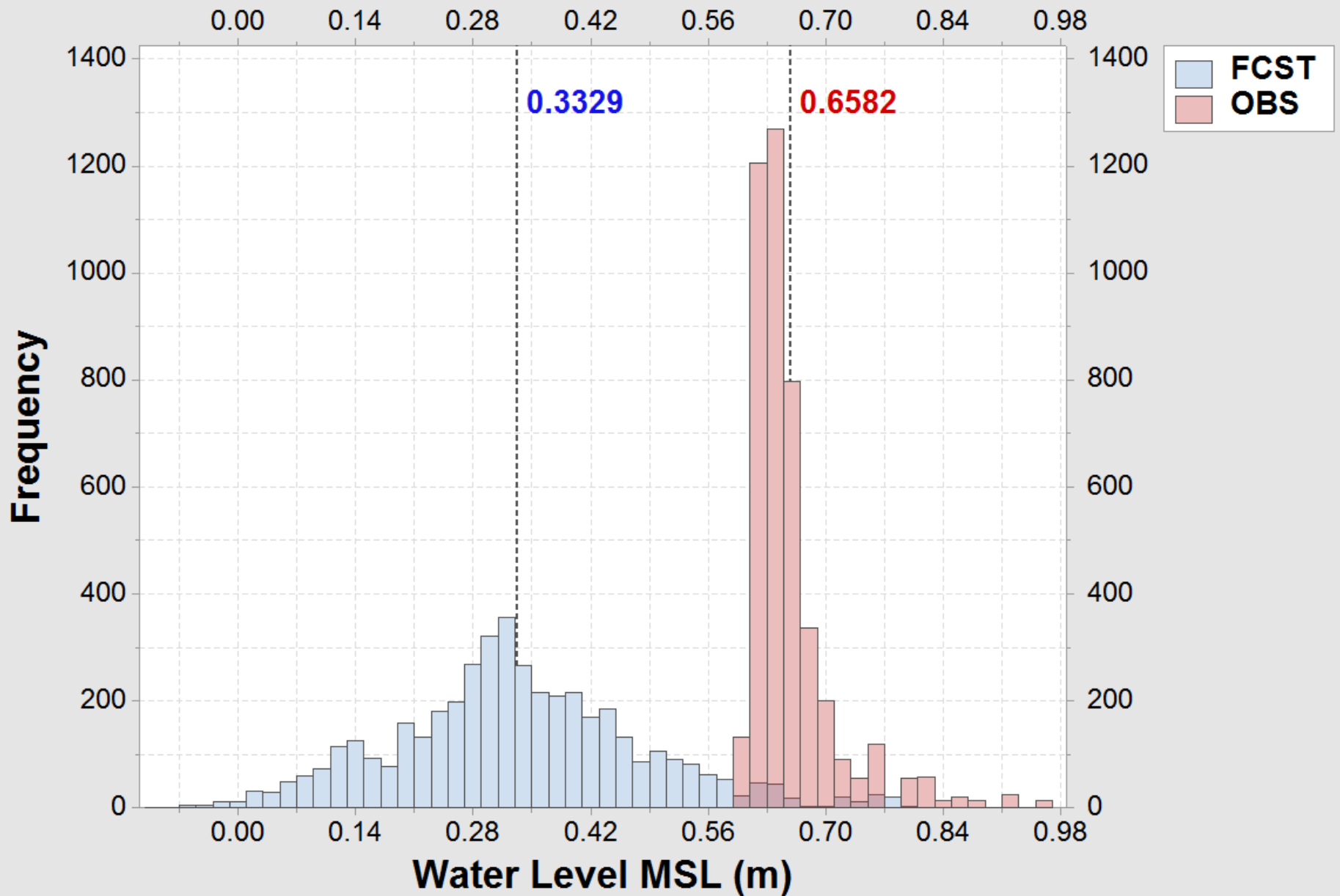
 - 219 hourly obs. (59 days)

- 105 Model Forecast days

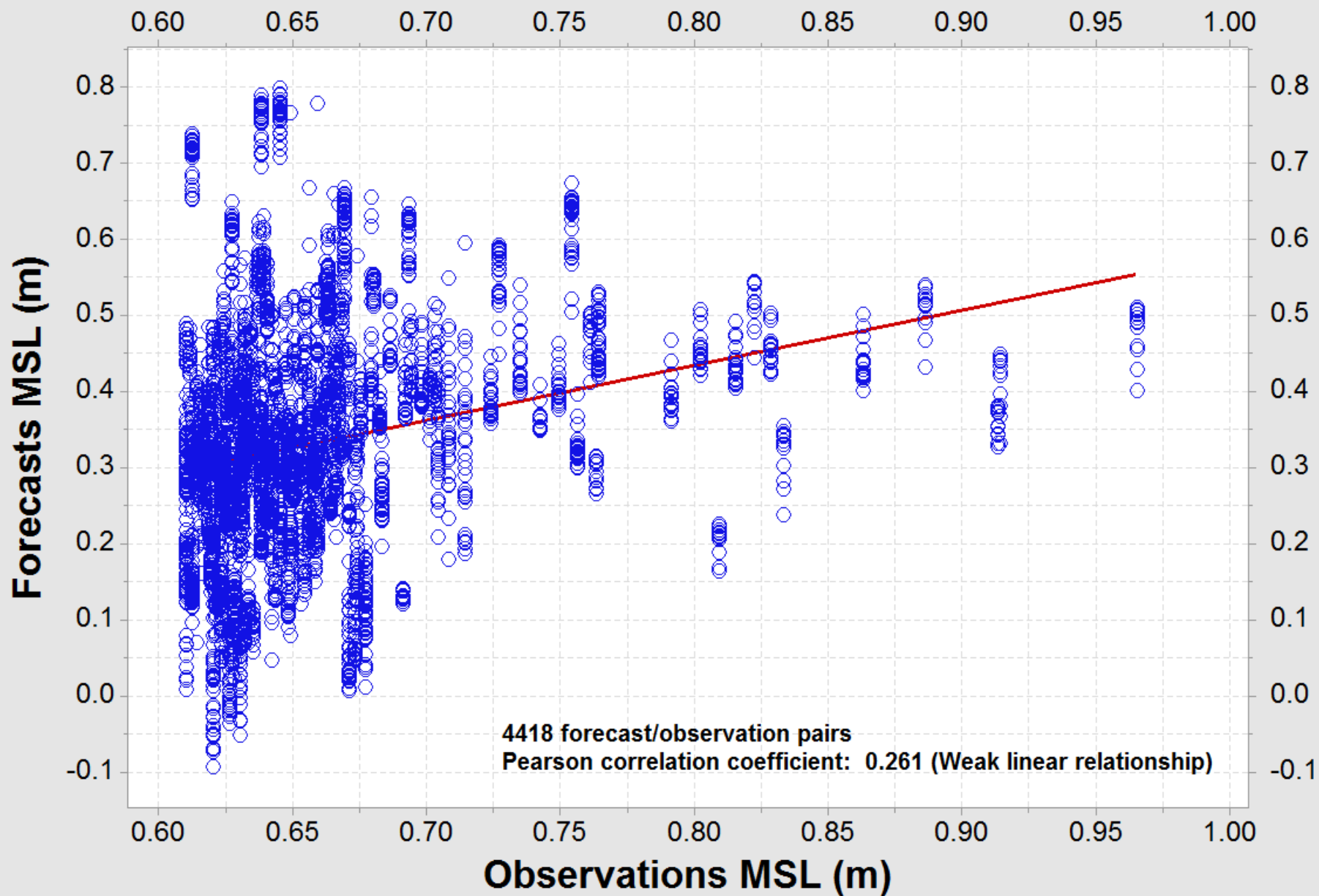
 - 90 for ETSS (Nov 2015 begin)



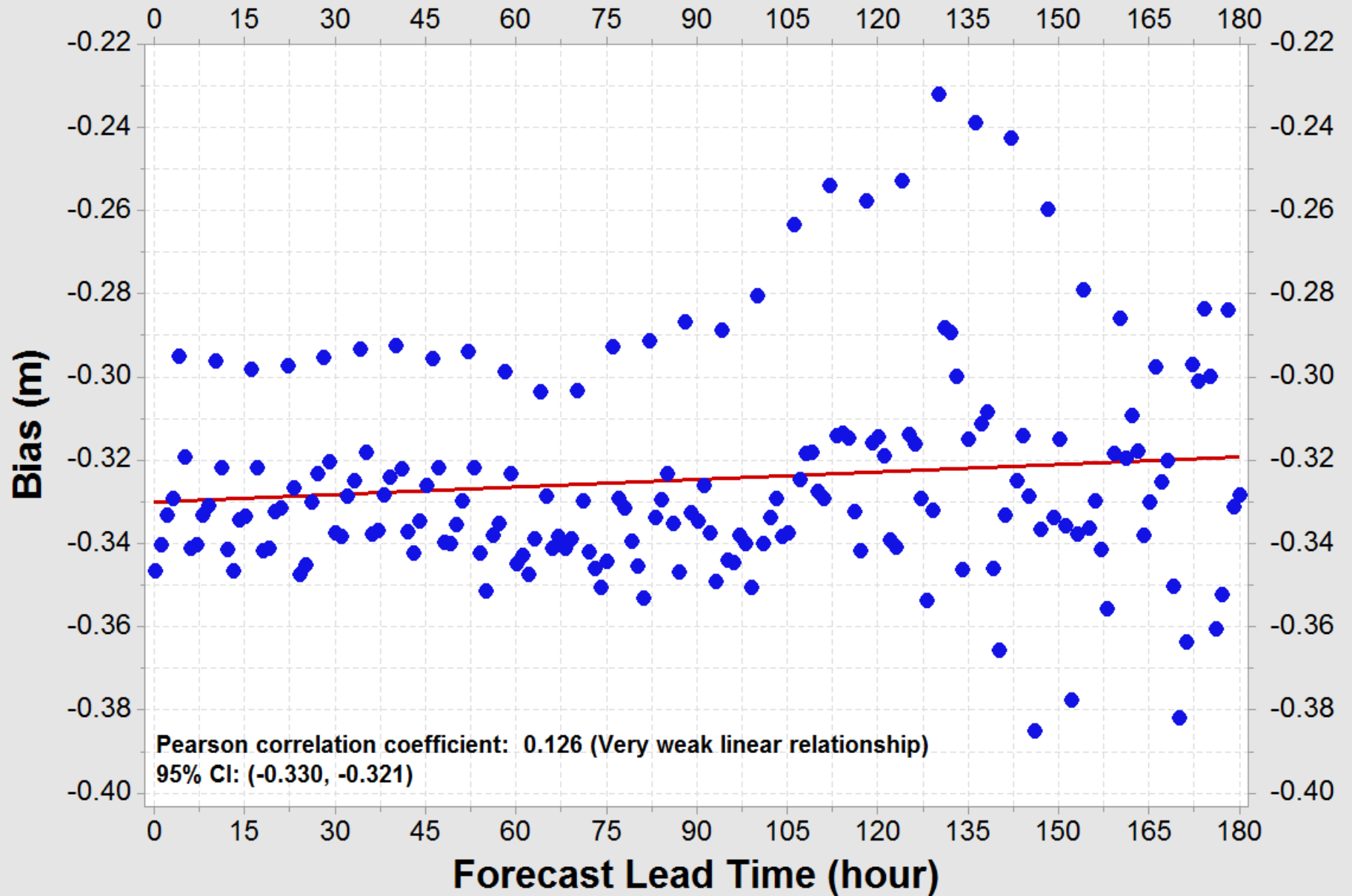
Water Level Observations and ESTOFS Forecasts for Bob Hall Pier



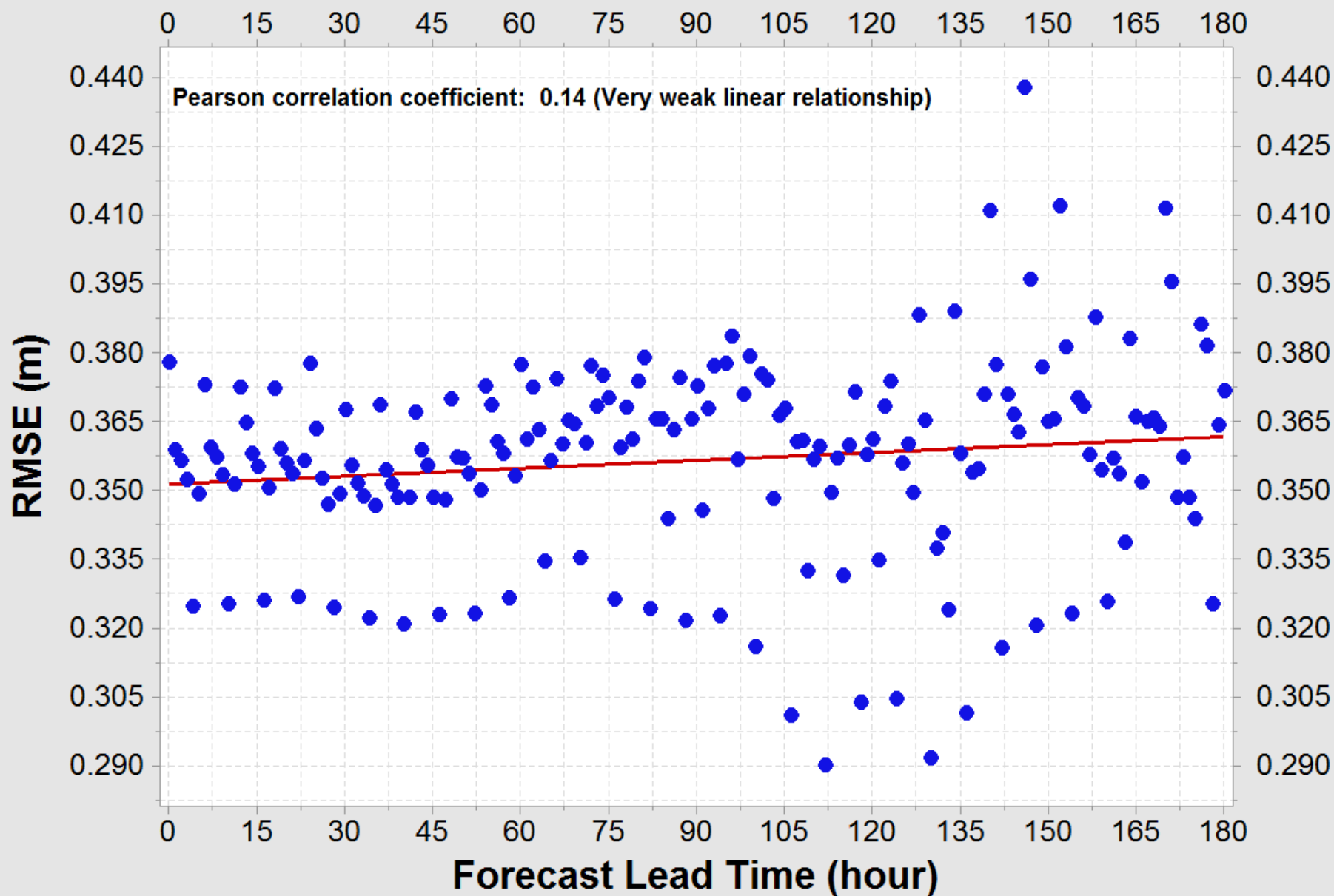
Water Level Observations and ESTOFS Forecasts for Bob Hall Pier



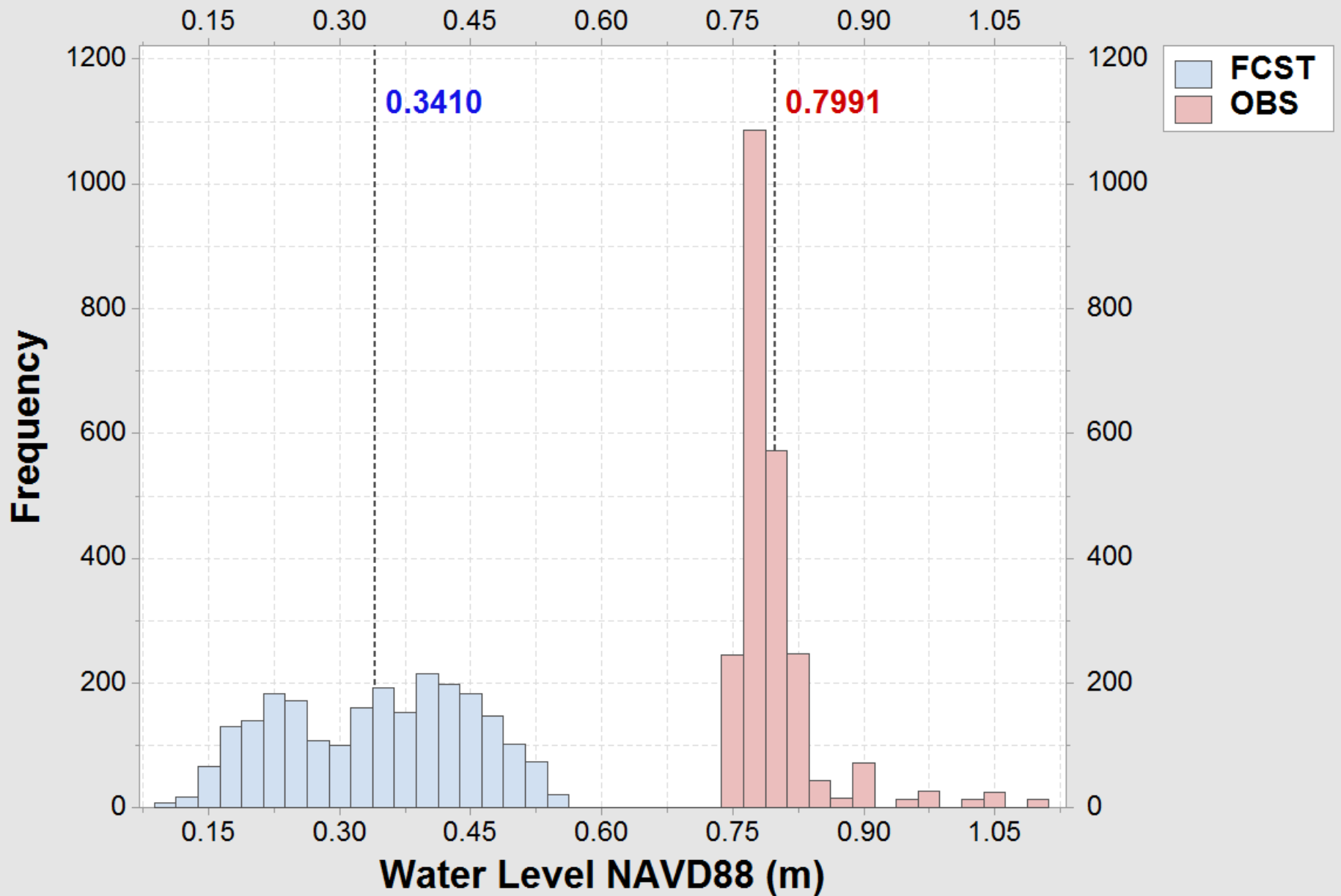
Linear Bias vs Lead Time of ESTOFS Forecasts for Bob Hall Pier



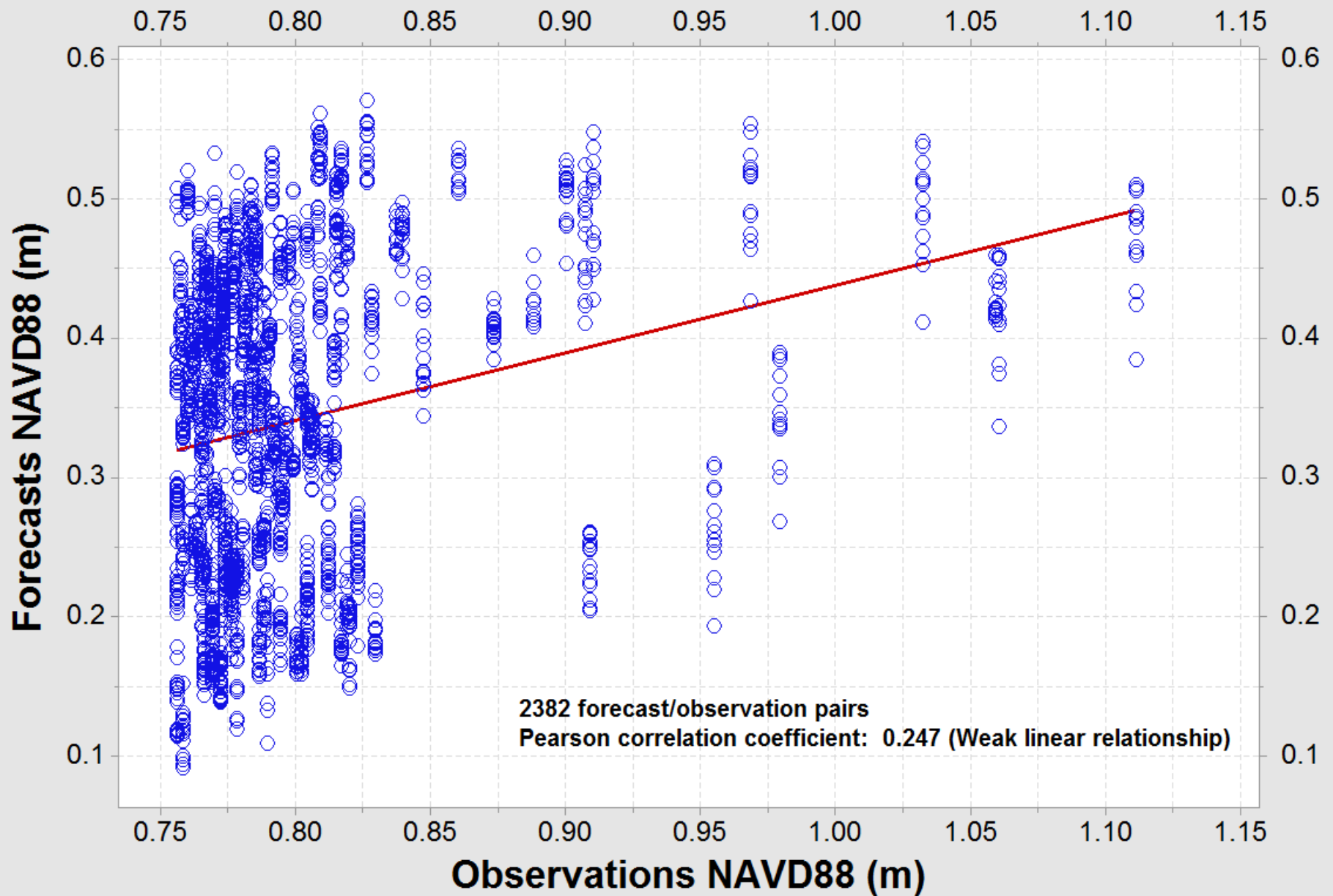
RMSE vs Lead Time of ESTOFS Forecasts for Bob Hall Pier



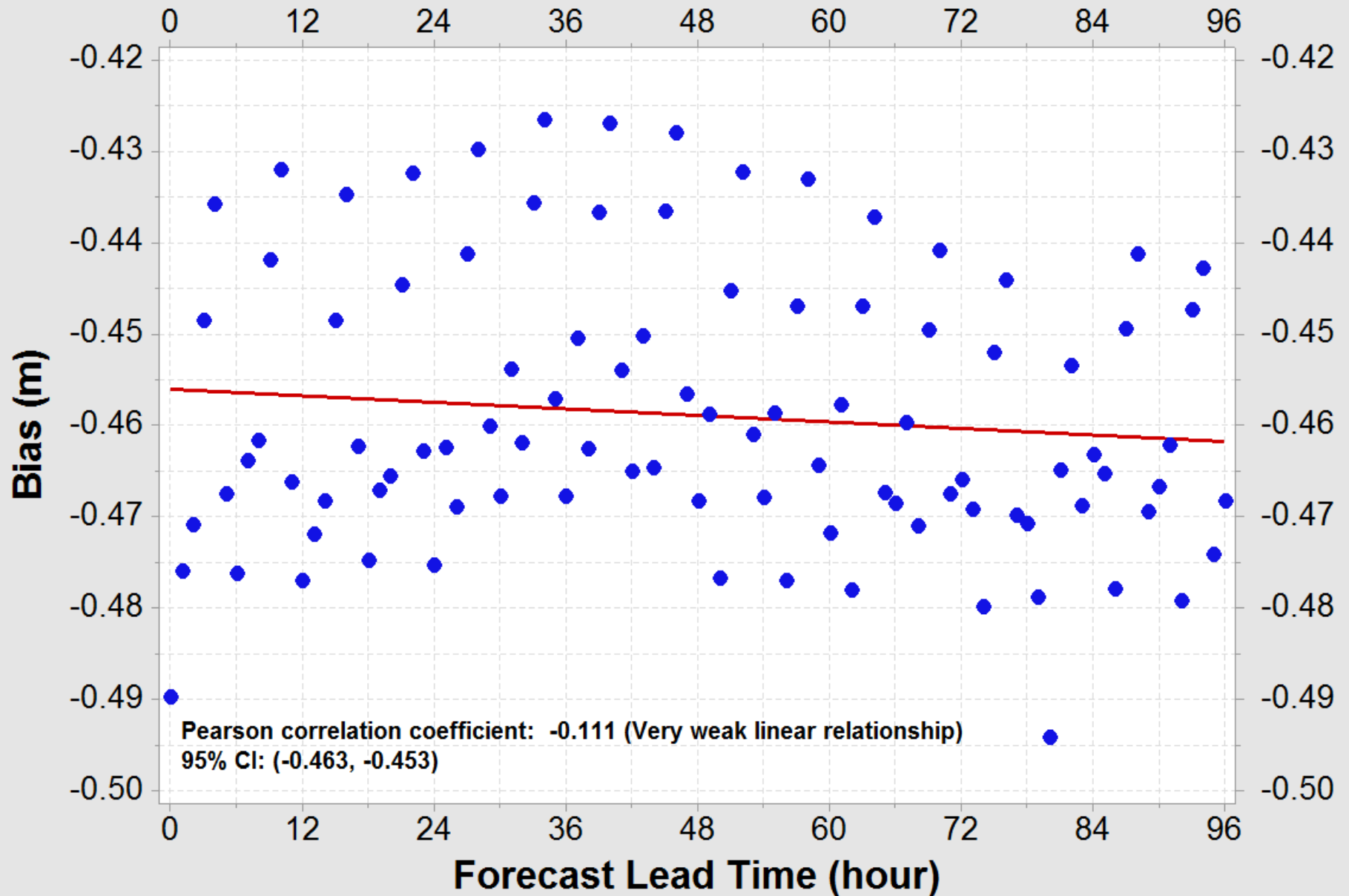
Water Level Observations and ETSS Forecasts for Bob Hall Pier



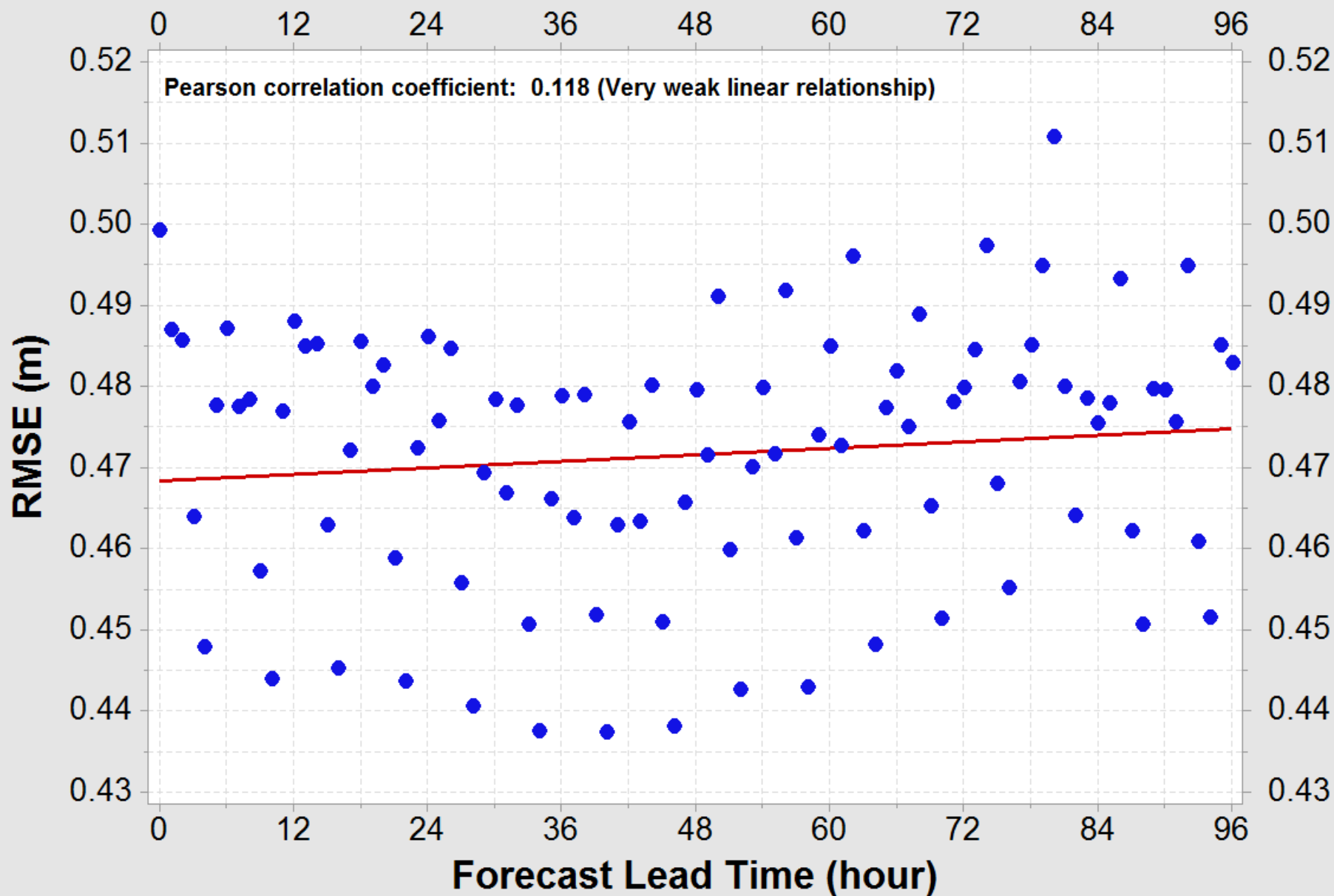
Water Level Observations and ETSS Forecasts for Bob Hall Pier



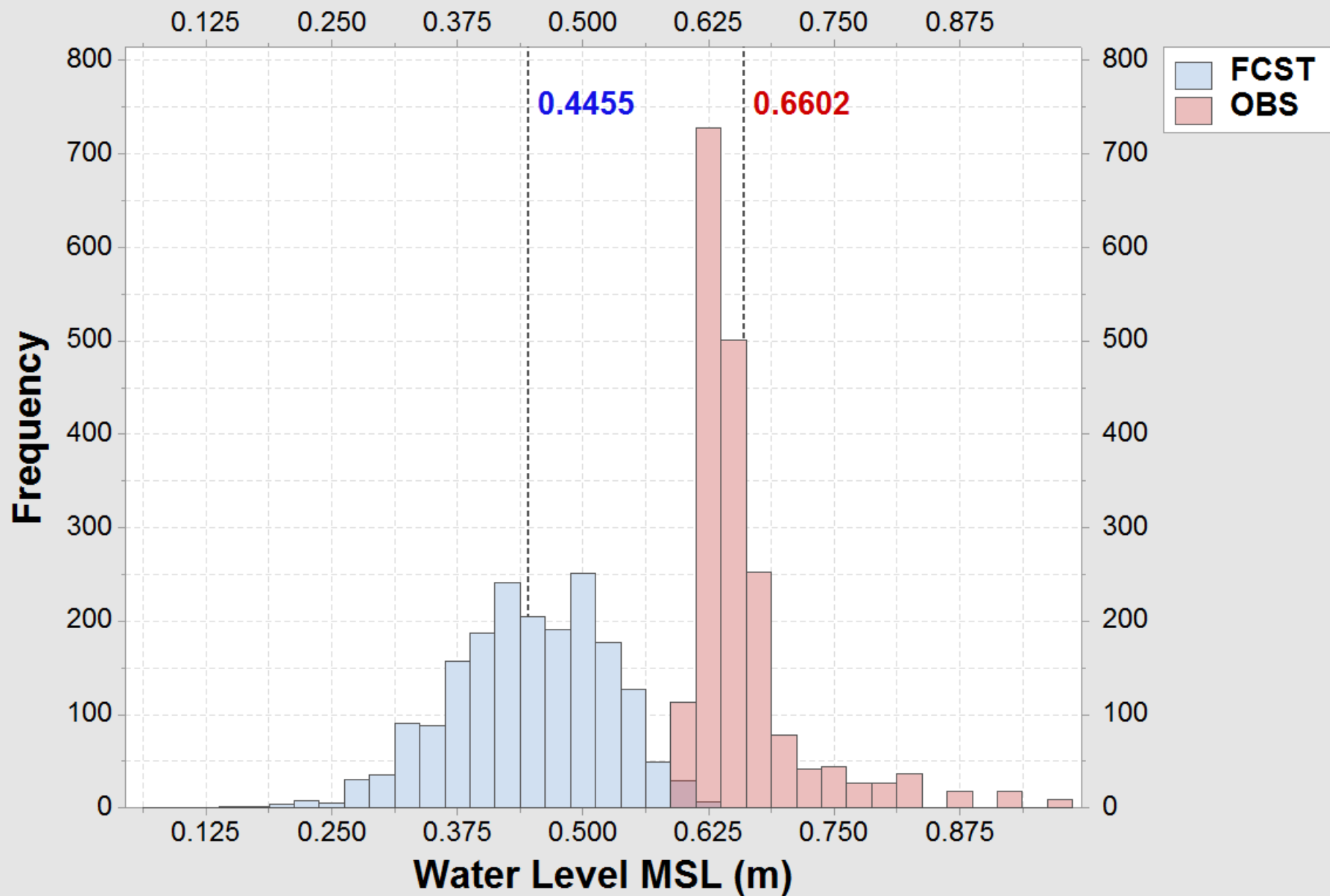
Linear Bias vs Lead Time of ETSS Forecasts for Bob Hall Pier



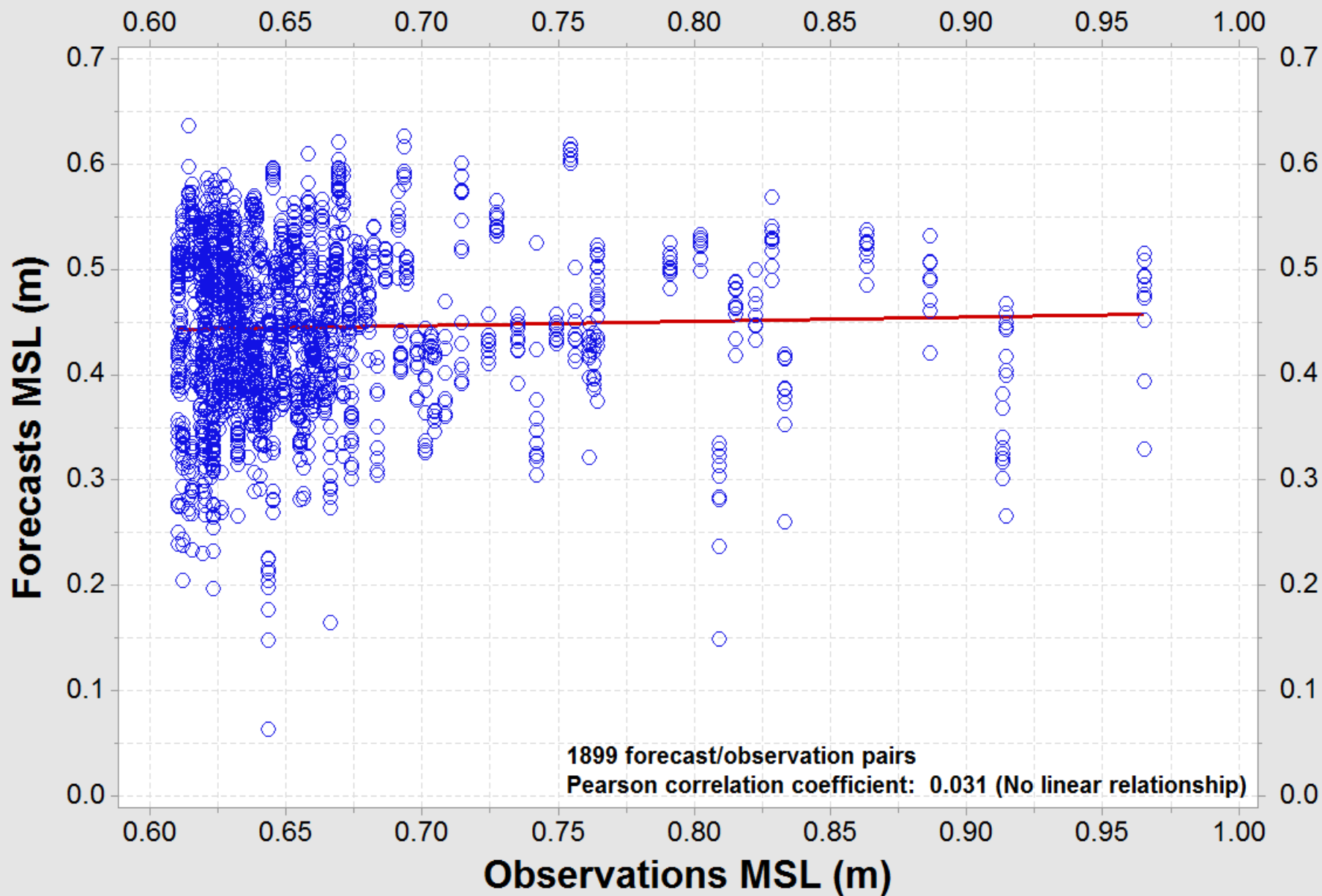
RMSE vs Lead Time of ETSS Forecasts for Bob Hall Pier



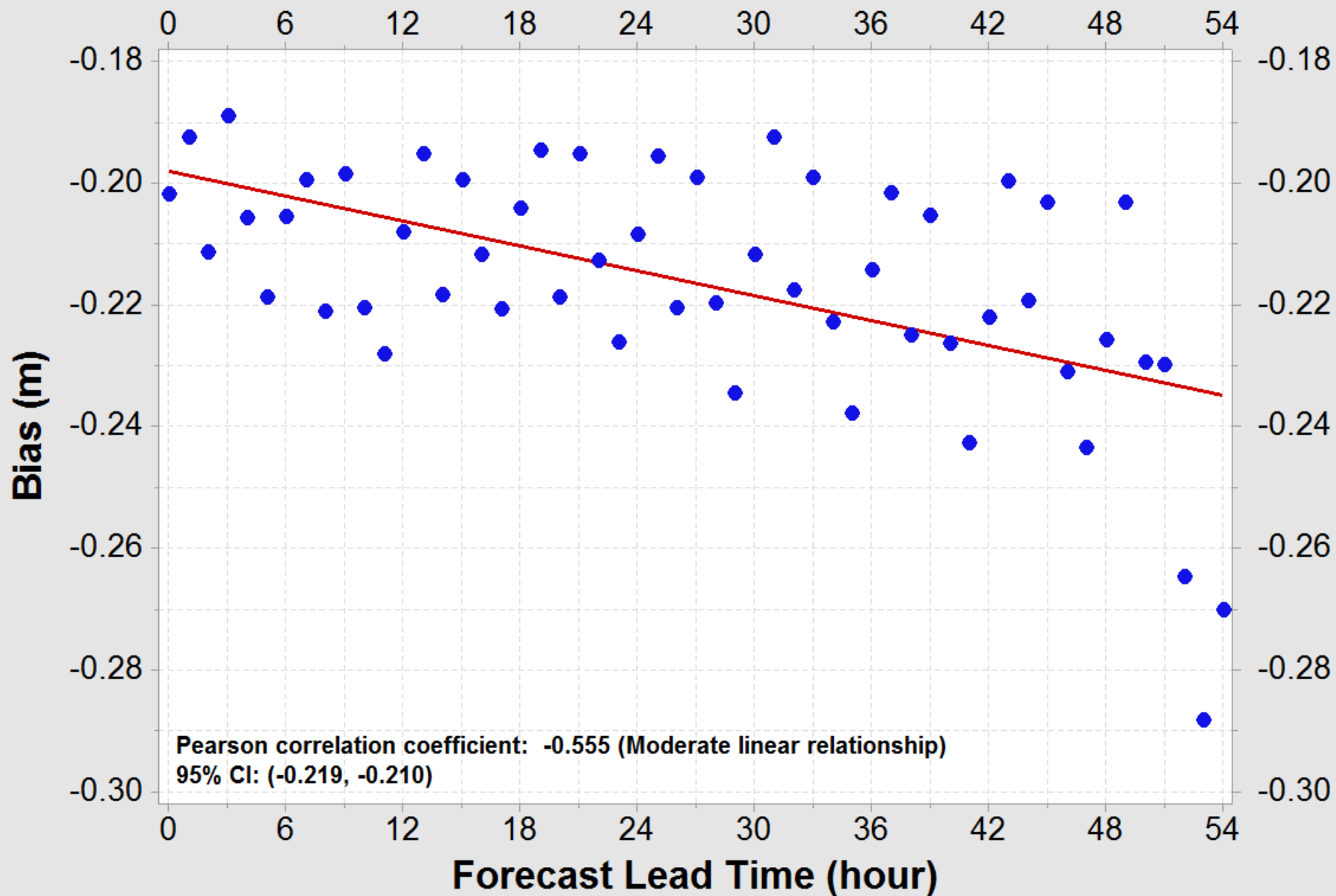
Water Level Observations and NGOFS Forecasts for Bob Hall Pier



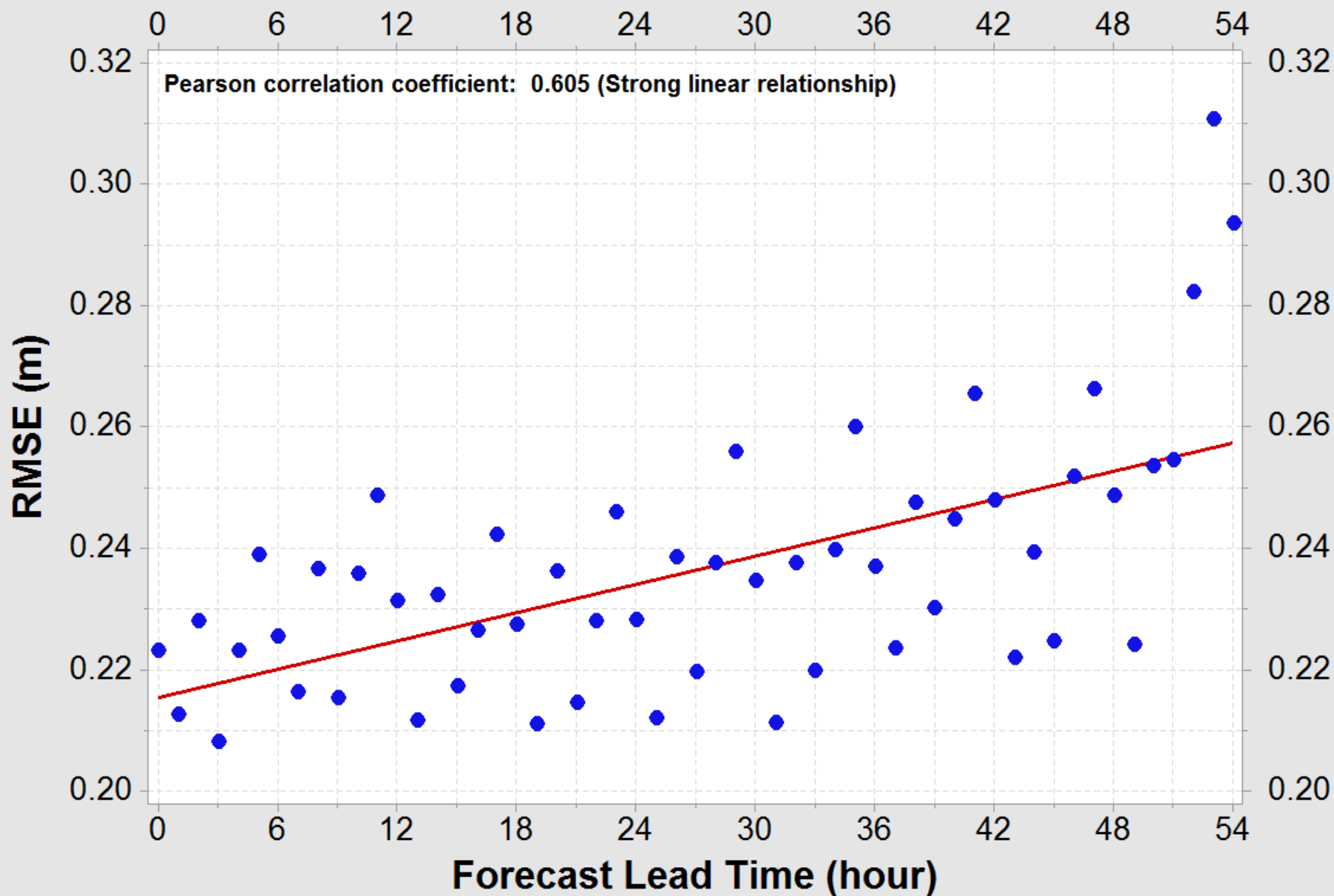
Water Level Observations and NGOFS Forecasts for Bob Hall Pier



Linear Bias vs Lead Time of NGOFS Forecasts for Bob Hall Pier



RMSE vs Lead Time of NGOFS Forecasts for Bob Hall Pier



Summary Stats

NGOFS

- **Bias:** -0.215 m
- **MAE:** 0.215 m
- **RMSE:** 0.235 m
- No linear relationship
- Not in AWIPS

ESTOFS

- **Bias:** -0.325 m
- **MAE:** 0.330 m
- **RMSE:** 0.356 m
- Strongest linear relationship

ETSS

- **Bias:** -0.458 m
- **MAE:** 0.458 m
- **RMSE:** 0.471 m
- Weak linear relationship

Questions

