

## Forecasting Great Lakes Water Levels Across Multiple Time Scales

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Department of Earth and Environmental Sciences

June 2020

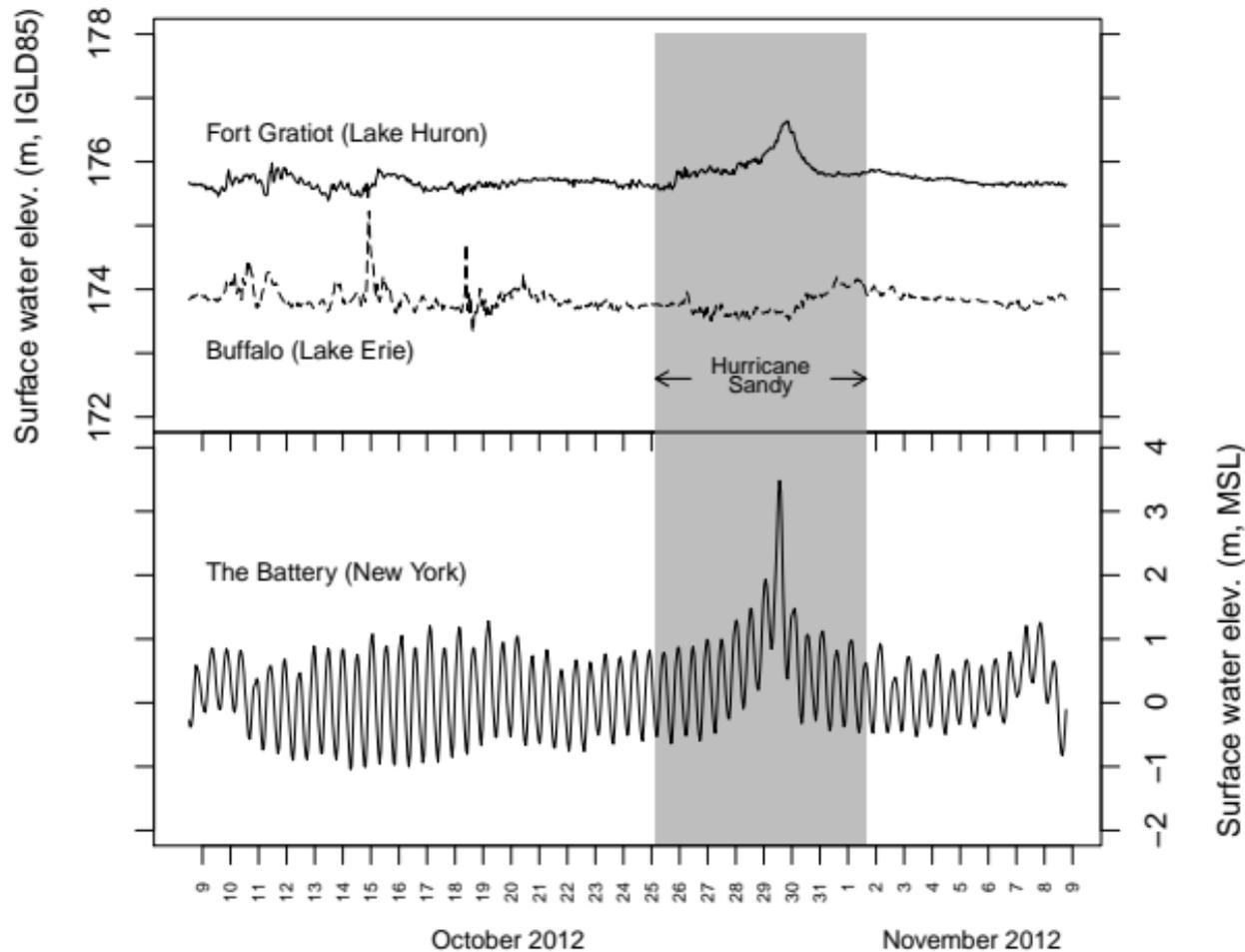


# Outline

- 1 Overview
- 2 Seasonal forecasting
- 3 Final thoughts

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To feet

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Contacts

About

?

Superior  Michigan-Huron  St. Clair  Erie  Ontario

Surface water elevation (meters: IGLD 85)

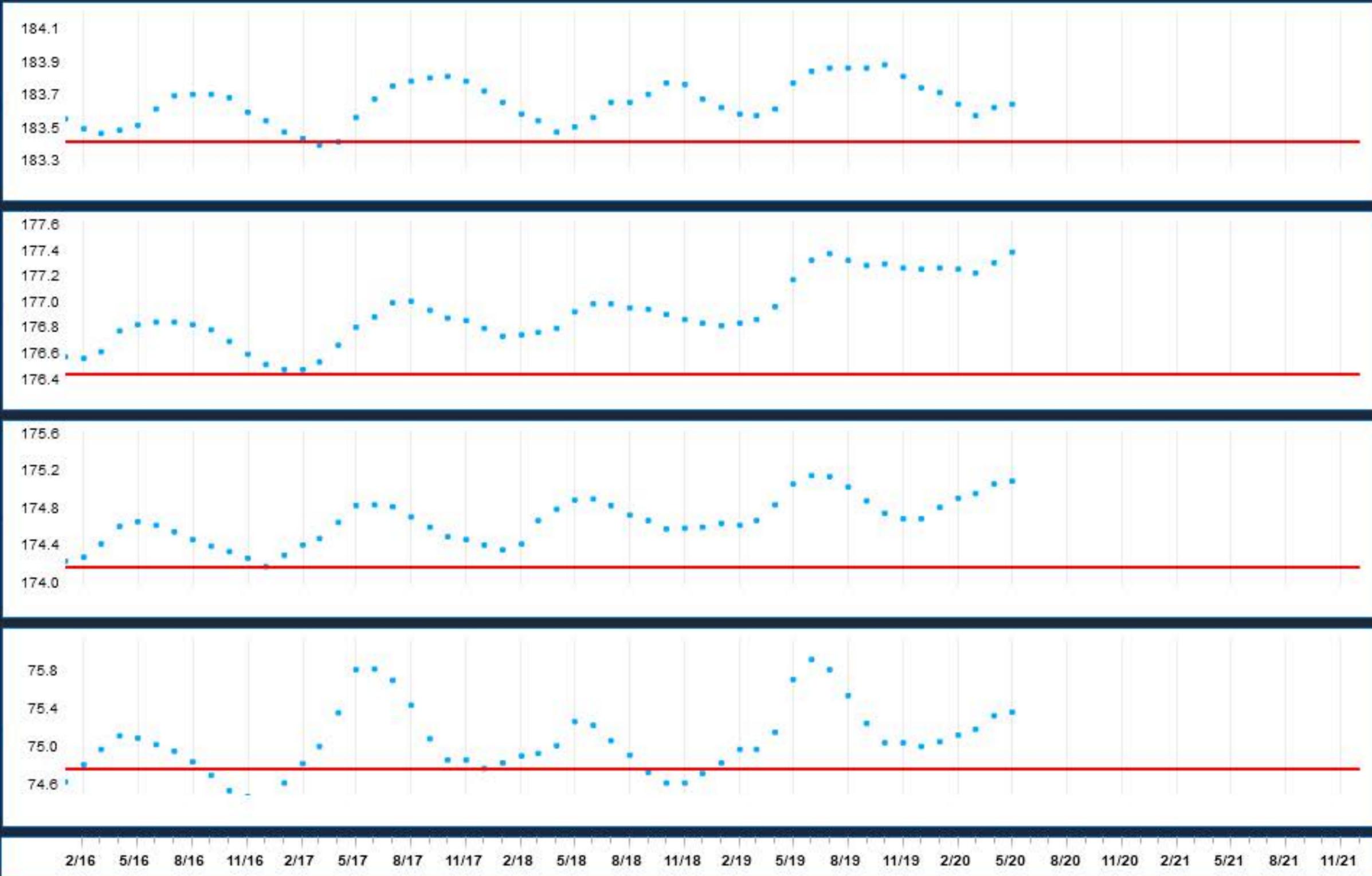
Superior

Michigan-Huron

Erie

Ontario

Zoom  
Pan



### Legend and menu

Clear all

#### Observations

- Lake-wide monthly average (1918-present)
- Provisional coordinated daily avgs (this month)
- Provisional coordinated avg for month to date
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- Average for period of record (1918-present)
- Month's average (1918-2016)
- Record highs (1918-2016)

#### Monthly level forecasts

Forecasts (multi-decadal)

Paleoclimate reconstructor

Default colors  Flip series

Chart background color

Timespan

2017 2021

Wed Jun 17 2020 07:17:25 AM

3  
Equalize vertical scale

[www.glerl.noaa.gov/data/dashboard/GLWLD.html](http://www.glerl.noaa.gov/data/dashboard/GLWLD.html)  
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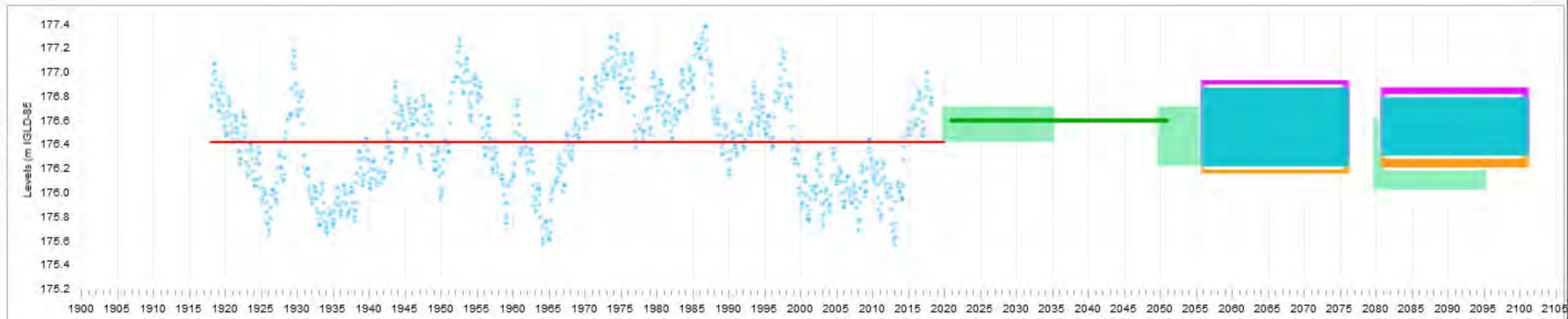




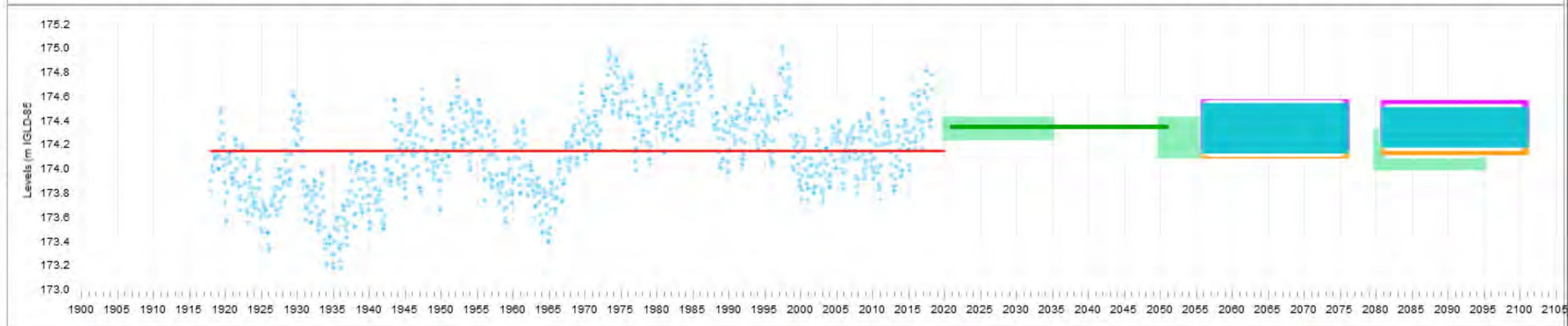
# Water Level Forecasting (multi-decadal)

## Lakes Michigan-Huron and Erie

Michigan-Huron



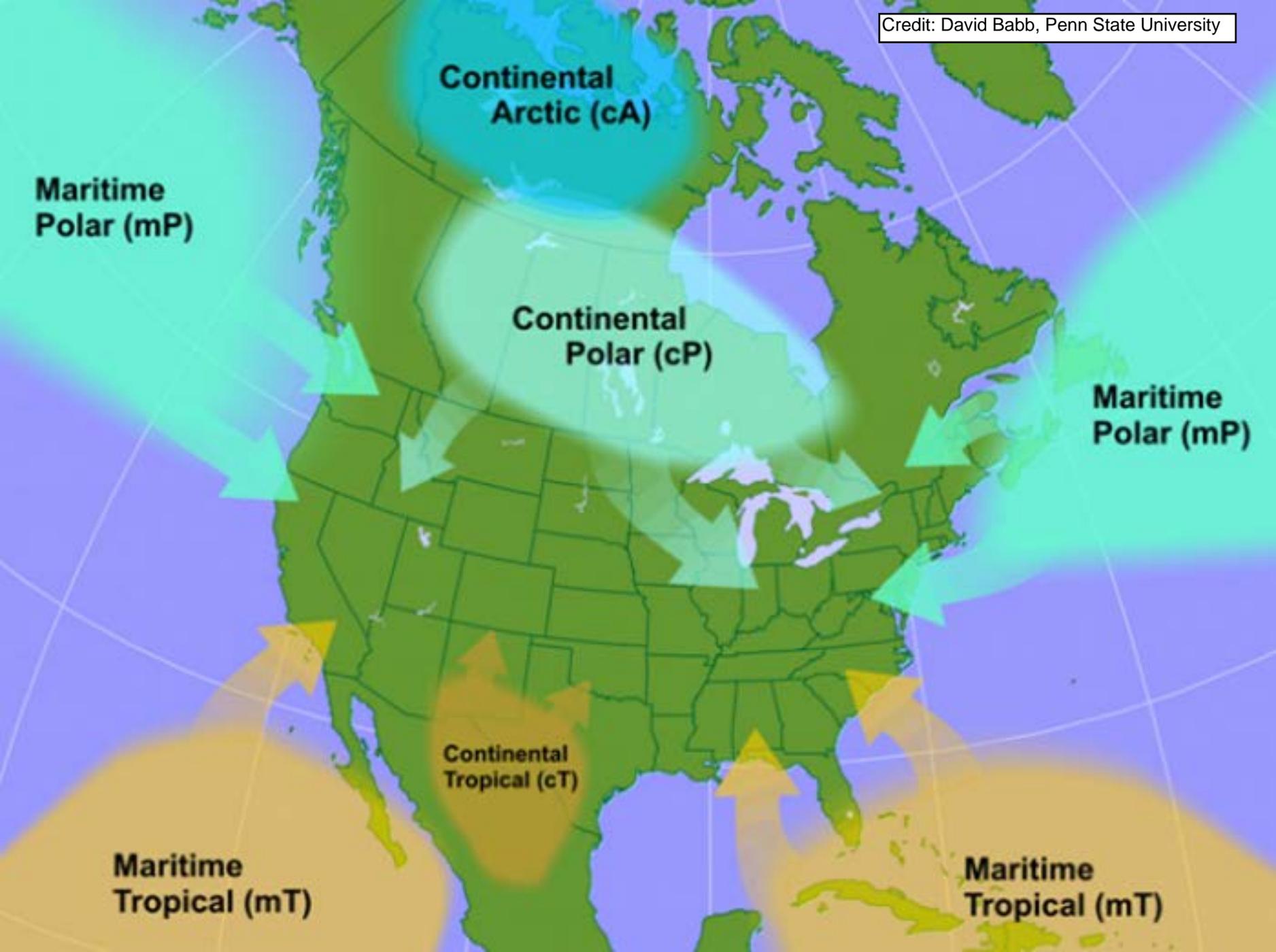
Erie



- Lake-wide monthly average (1918-present)
- Provisional avg for month to date from coordinated gauges
- Angel et al. (2010) A2 - multi-GCM
- Mackay and Seglenieks (2012): A2 - CGCM3
- Lofgren and Rouhana (2015): Clausius-Clapeyron
- Lofgren and Rouhana (2015): Energy Adjustment
- Lofgren and Rouhana (2015): Priestley-Taylor
- Lake-wide period of record average (1918-present)

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**Maritime  
Polar (mP)**

**Continental  
Arctic (cA)**

**Continental  
Polar (cP)**

**Maritime  
Polar (mP)**

**Continental  
Tropical (cT)**

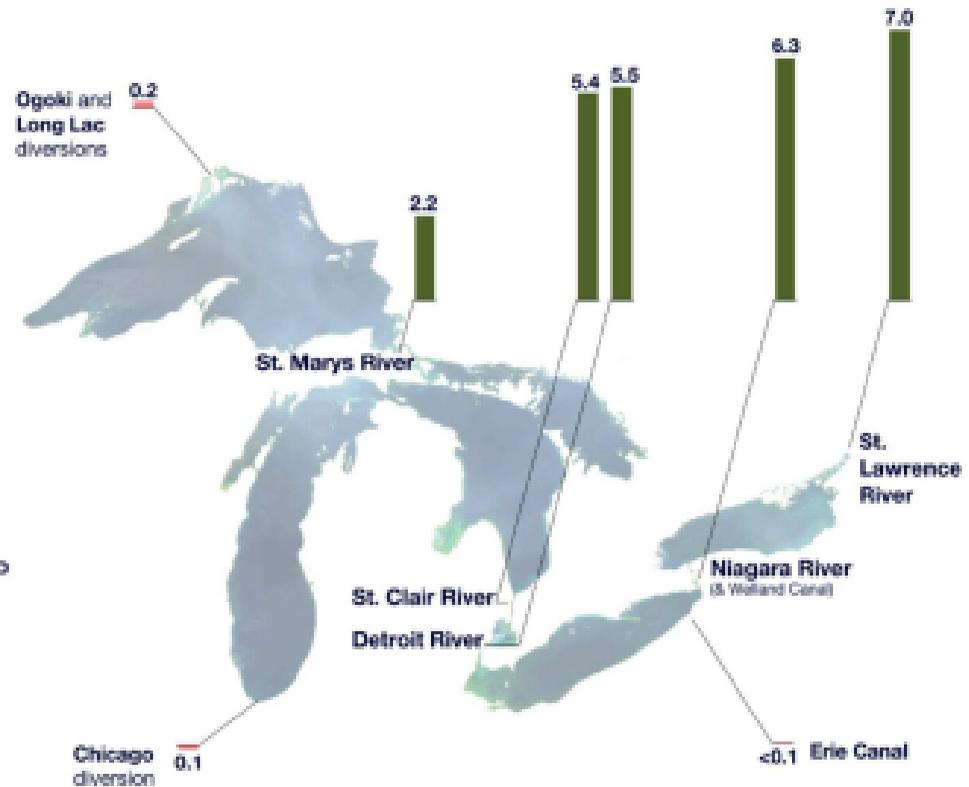
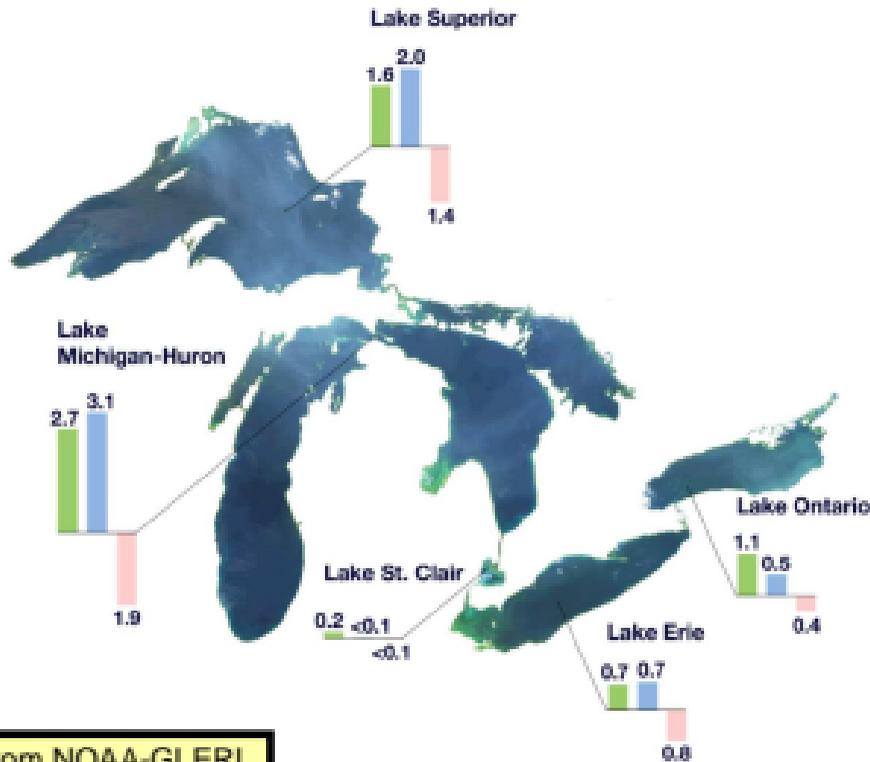
**Maritime  
Tropical (mT)**

**Maritime  
Tropical (mT)**

- Runoff
- Overlake Precipitation
- Overlake Evaporation

- Flow Between Lakes
- Diversions

All values are averaged over the period 1950-2010 and are in thousands of cubic meters per second.



From NOAA-GLERL

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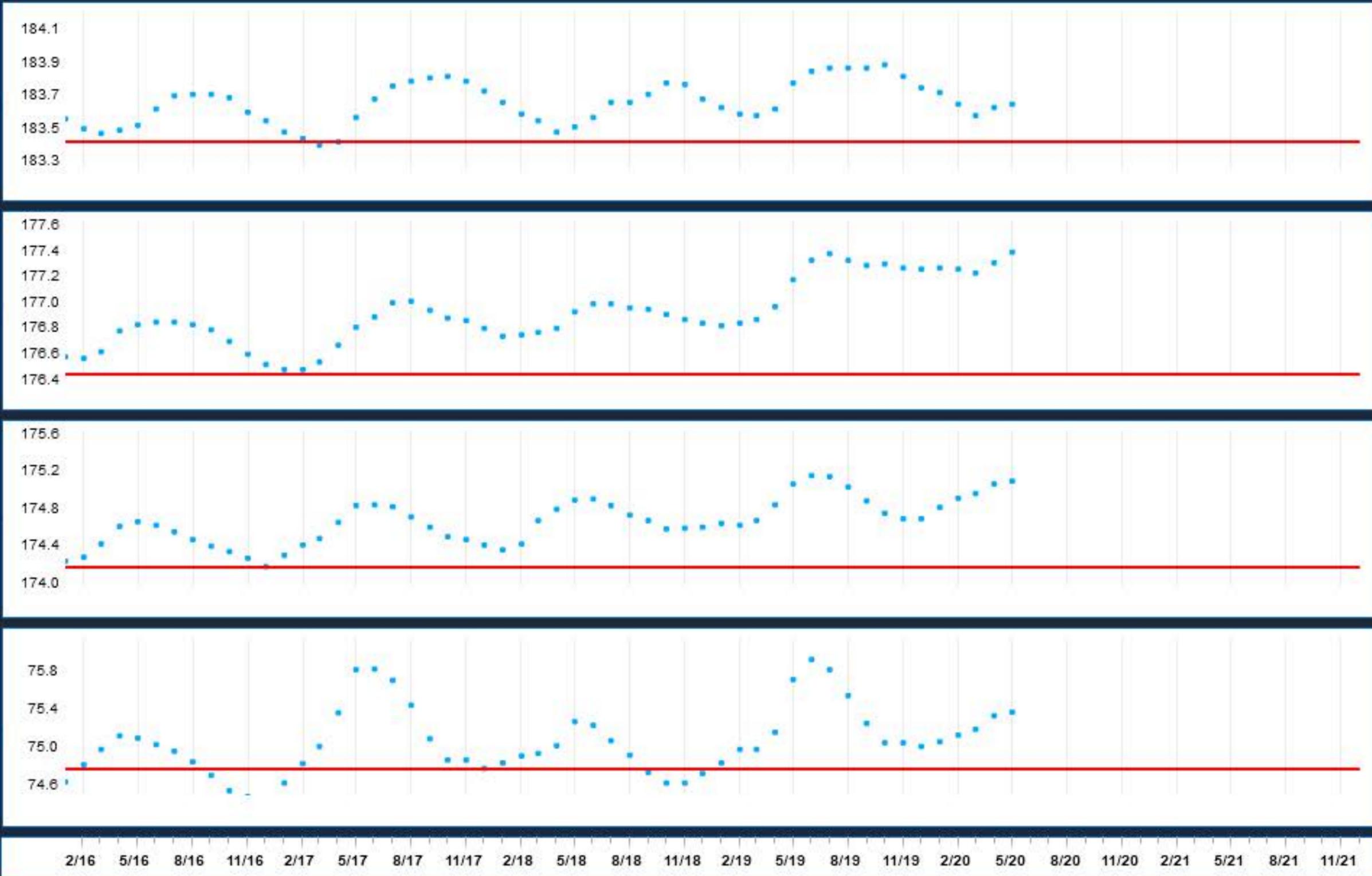
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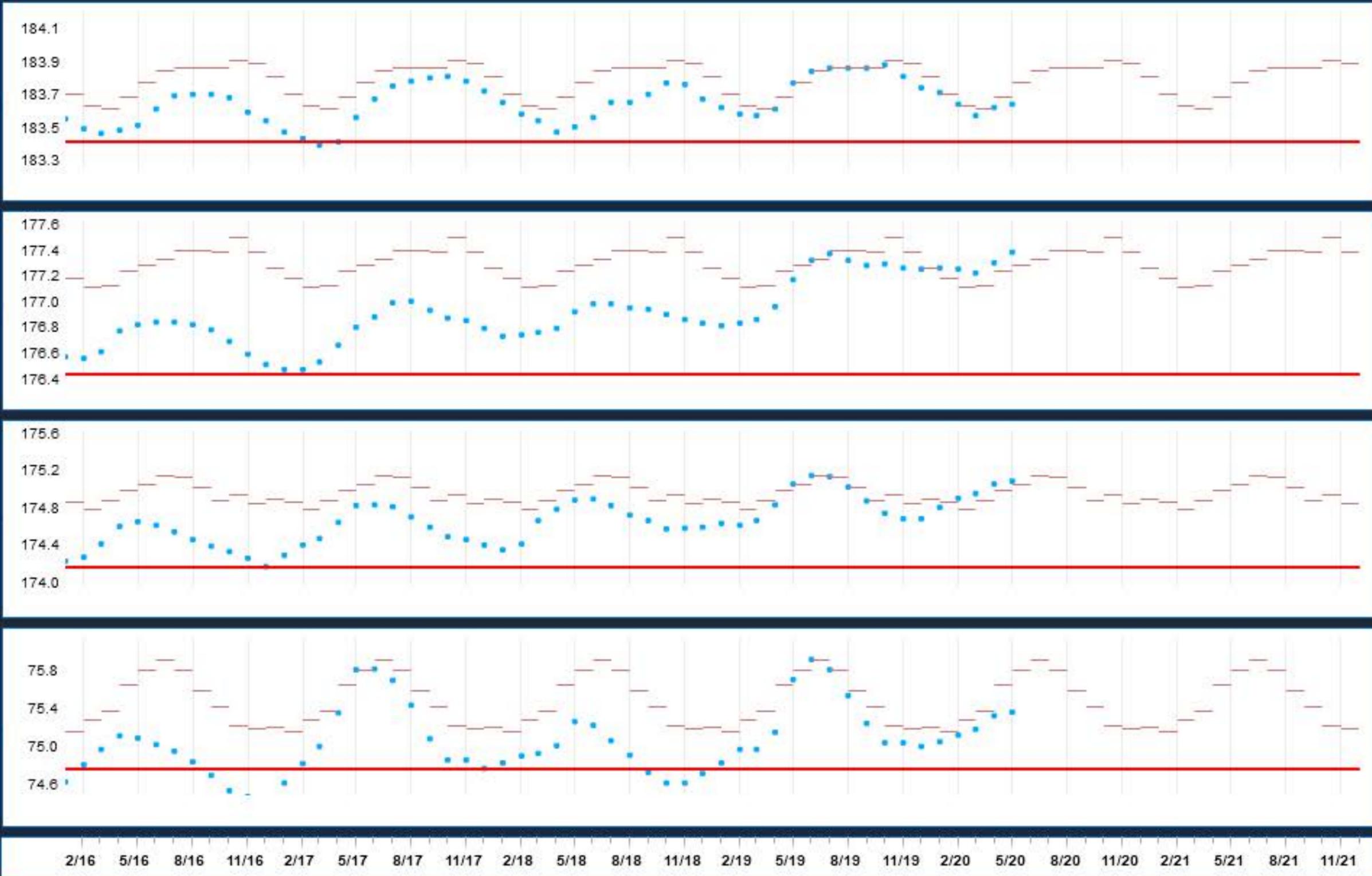
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Observations

Monthly level forecasts

**COORDINATED FORECASTS**

Current forecasts

- 6 month forecast (coordinated)

Archived forecasts

- 3 month out forecast (coordinated)
- 6 month out forecast (coordinated)

**EXPERIMENTAL AHPS FORECASTS**

Current forecasts

- 10 month forecast (AHPS - experimental)

Archived forecasts

- 3 month out forecast (AHPS - experimental)
- 6 month out forecast (AHPS - experimental)

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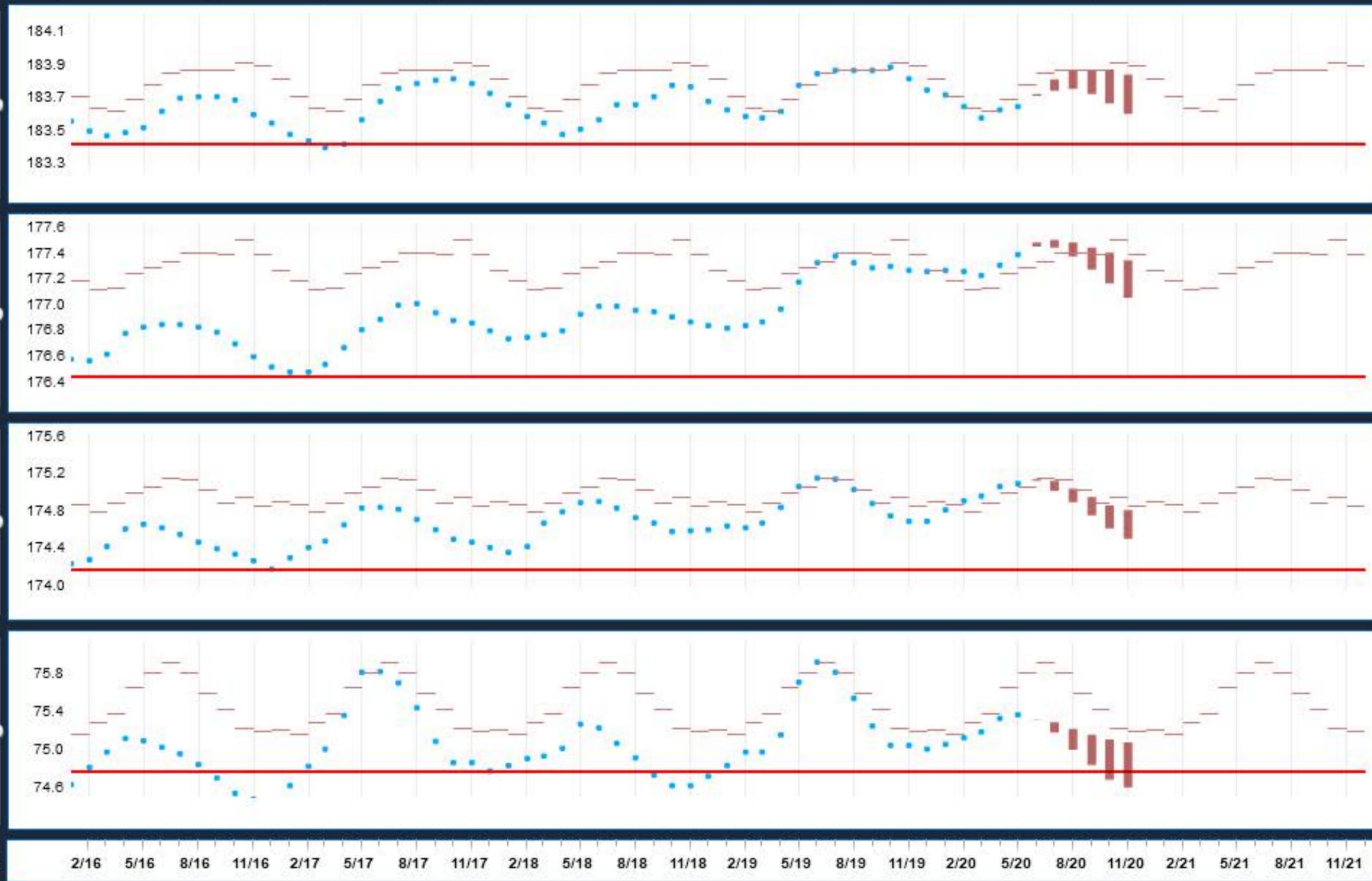
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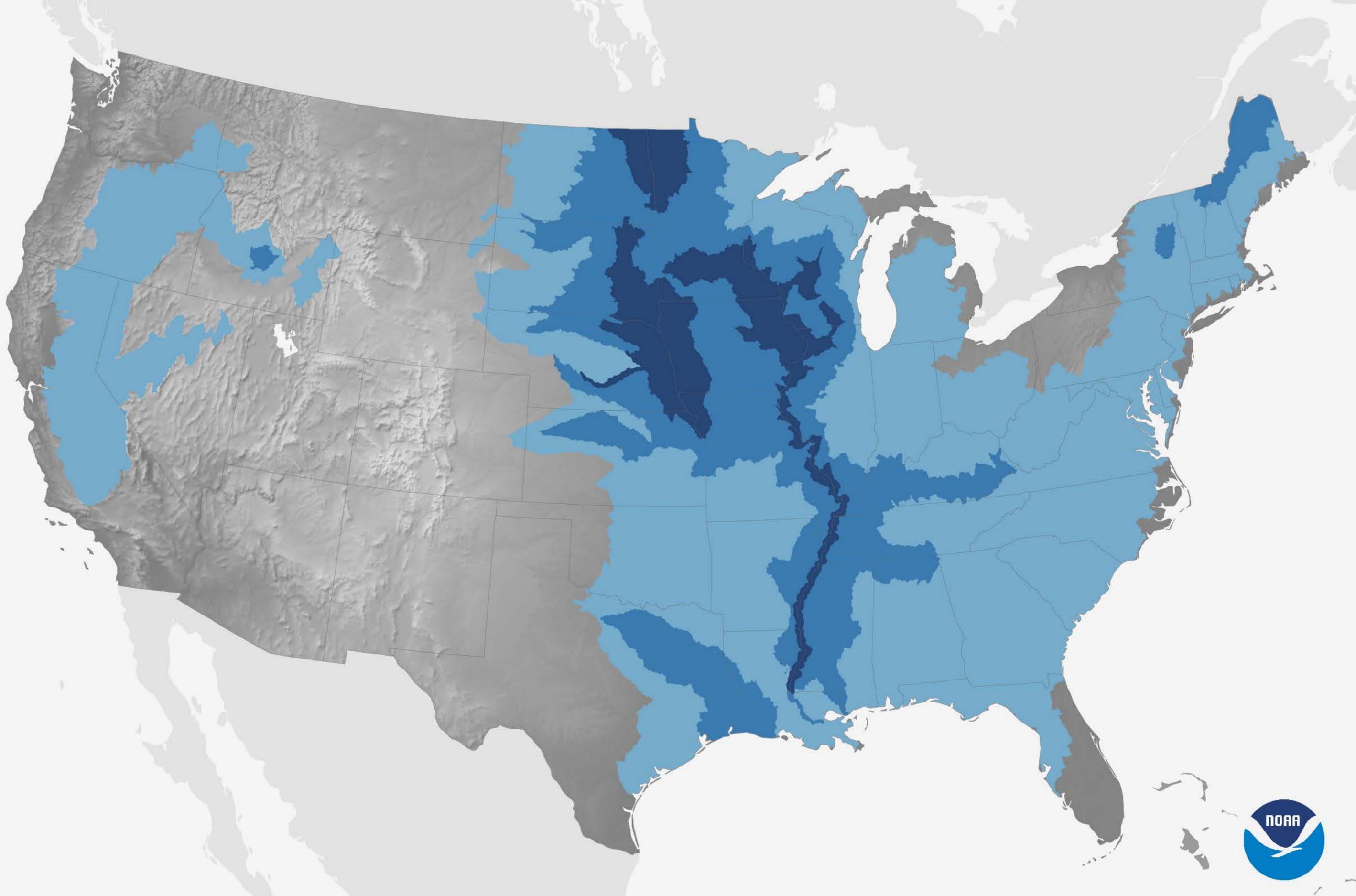
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Climate.gov  
Data: OWP

### Spring flood risk potential



minor

moderate

major

Flood Outlook  
for March - May  
Issued 2019 Mar 21



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