

# Record Water Levels on Lake Ontario and the NWS WFO Buffalo IDSS Response

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WFO Buffalo NY

# Lake Ontario



# Lake Ontario - St. Lawrence River Local Drainage Basins to Trois-Rivières



# International Joint Commission (IJC)

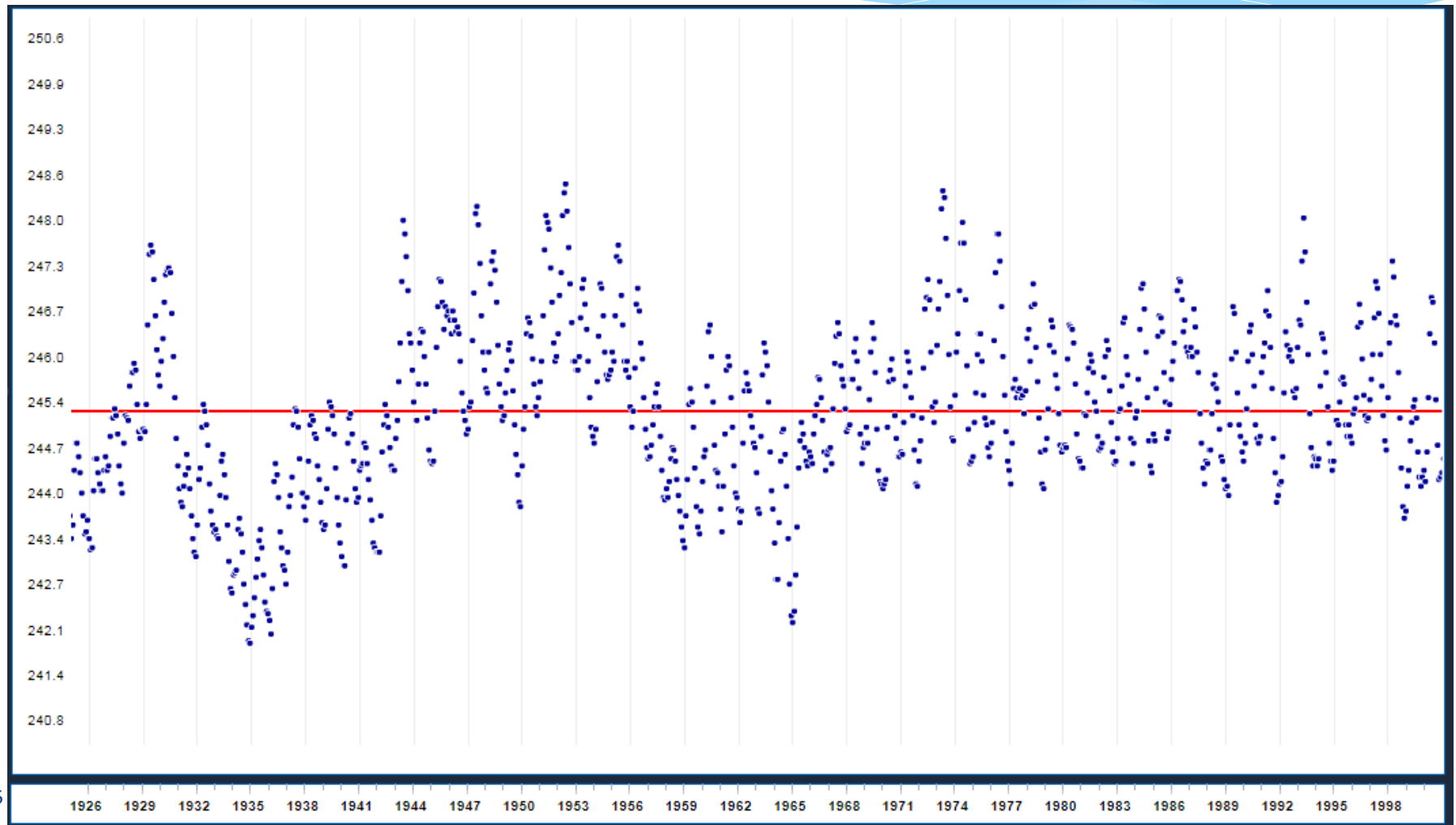


- \* An international organization created by the Boundary Waters Treaty

- \* Signed by Canada and the United States in 1909

- \* Created the International Lake Ontario – St. Lawrence Board (formerly St. Lawrence River Board of Control) in 1952
  - \* The Board's main duty is to ensure that outflows from Lake Ontario meet the requirements of the IJC order.
  - \* The Board also has responsibilities to communicate with the public about water levels and flow regulation, and monitor and assess the performance of the regulation plan.

# Lake Ontario Water Levels (GLERL Dashboard)



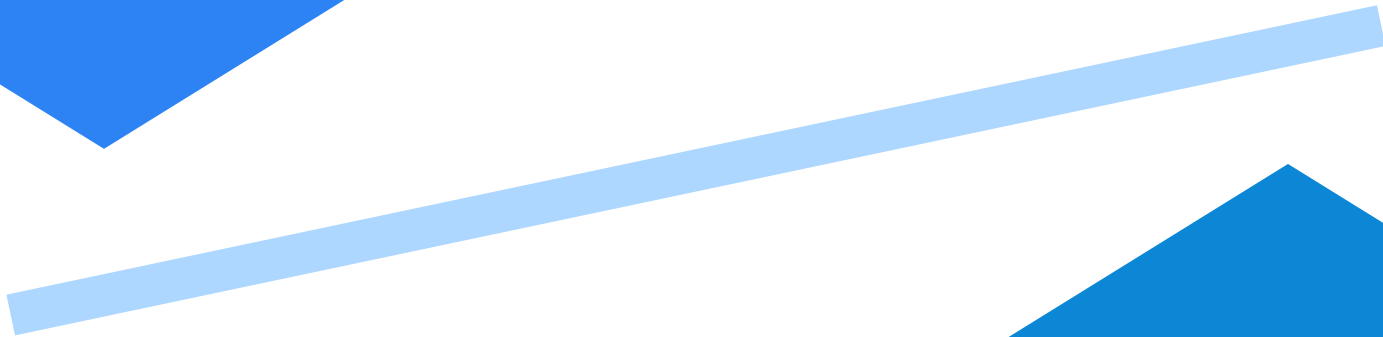
# Plan 2014

- \* Plan 2014 sets a new standard for managing water levels and flows that is based on careful consideration of the needs of all interests the basin – now and in the future.
- \* Variable ice cover, increased storm intensity and warmer temperatures are changing how water levels and flows impact coastal communities, recreational boating and commercial navigation, drinking water, hydropower production, and the system's ecological health.
- \* Allowing more natural variations in water levels, while moderating extreme levels, can help restore a healthy wetland ecosystem on the lake and upper river.

# Water Level Balancing Act



1. Evaporation
2. Outflow into the St. Lawrence River



1. Inflow from Lake Erie
2. Precipitation on Lake
3. Runoff into Lake



# And don't forget the wind and waves

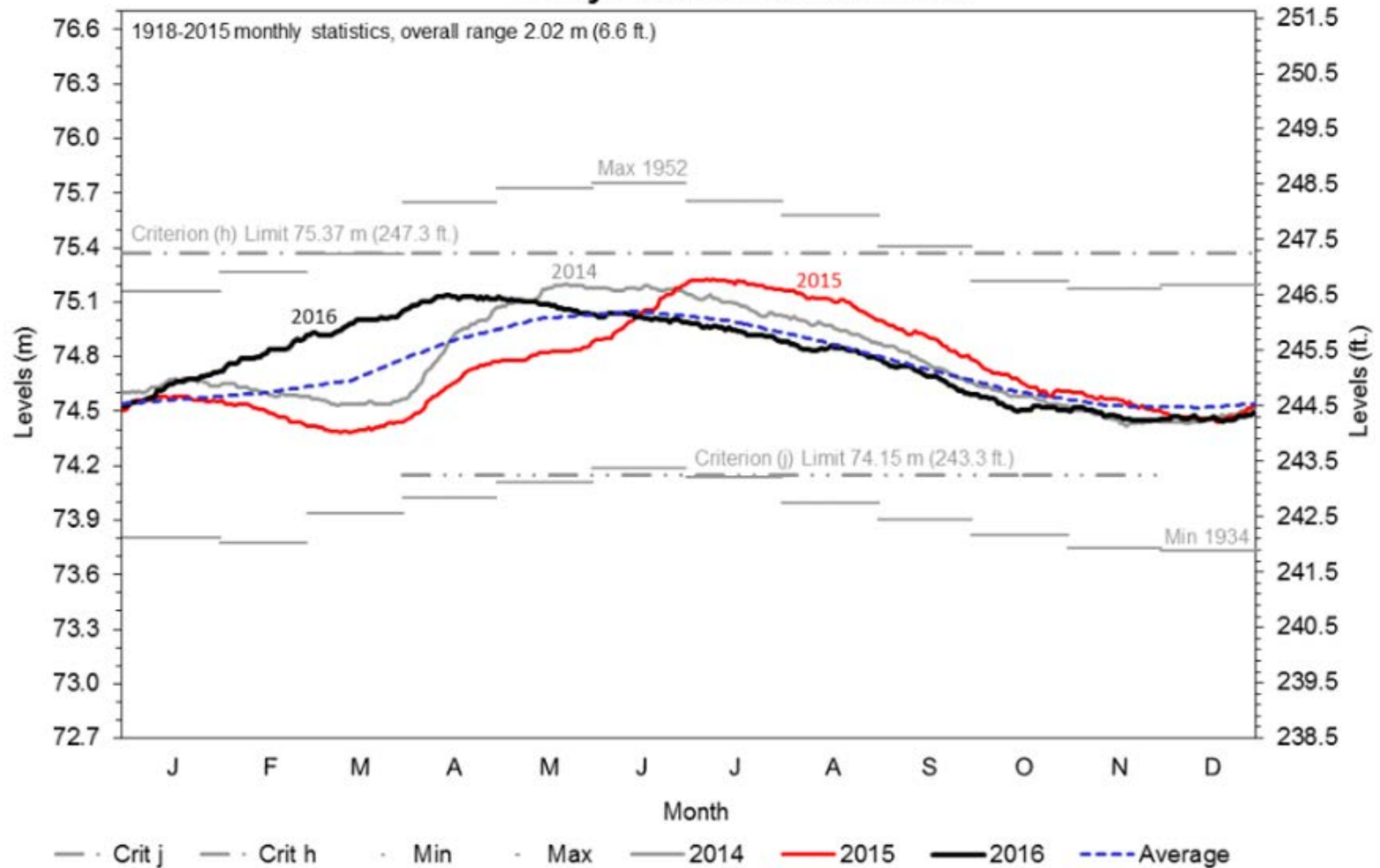
- \* Winds produce surge of water at downwind
- \* Once winds subside, seiche occurs until water levels itself
- \* Waves exacerbate flooding and erosion



# Leading Up to the Flooding

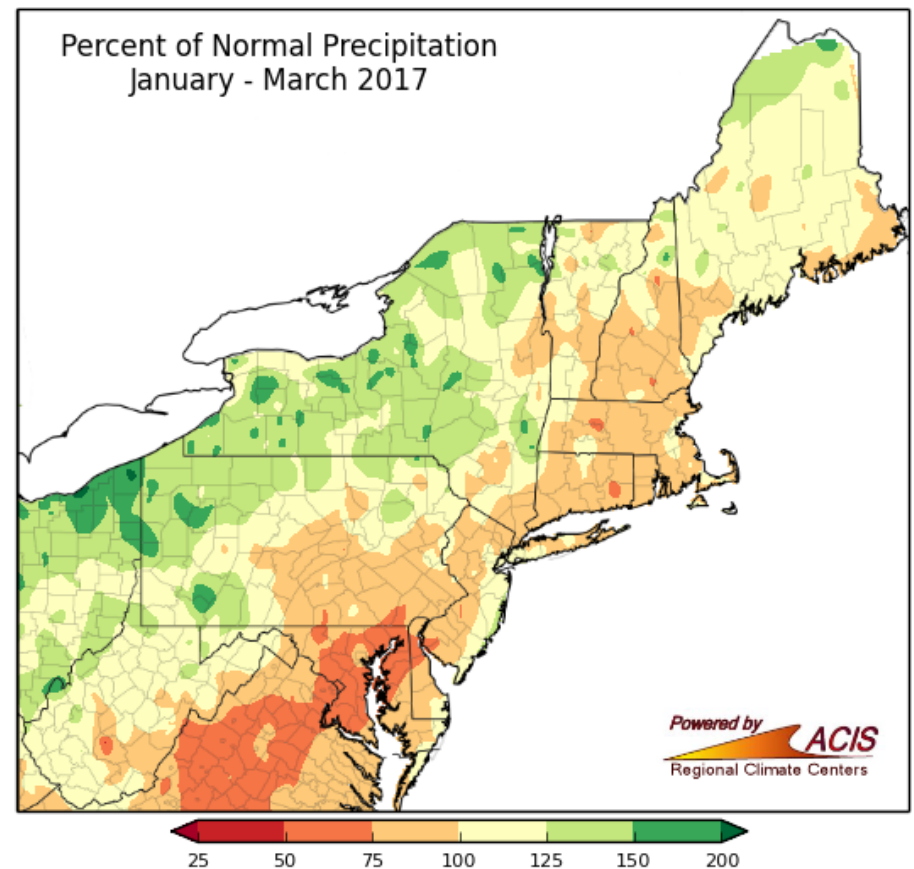
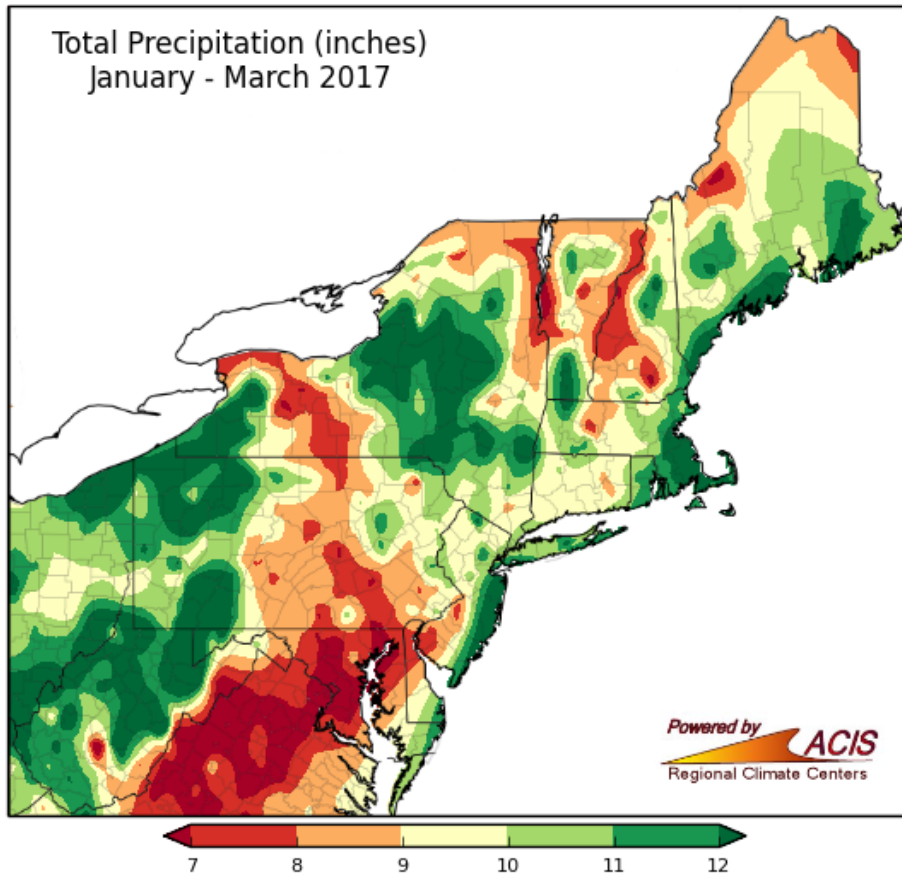
# 2016

## Daily Lake Ontario Levels

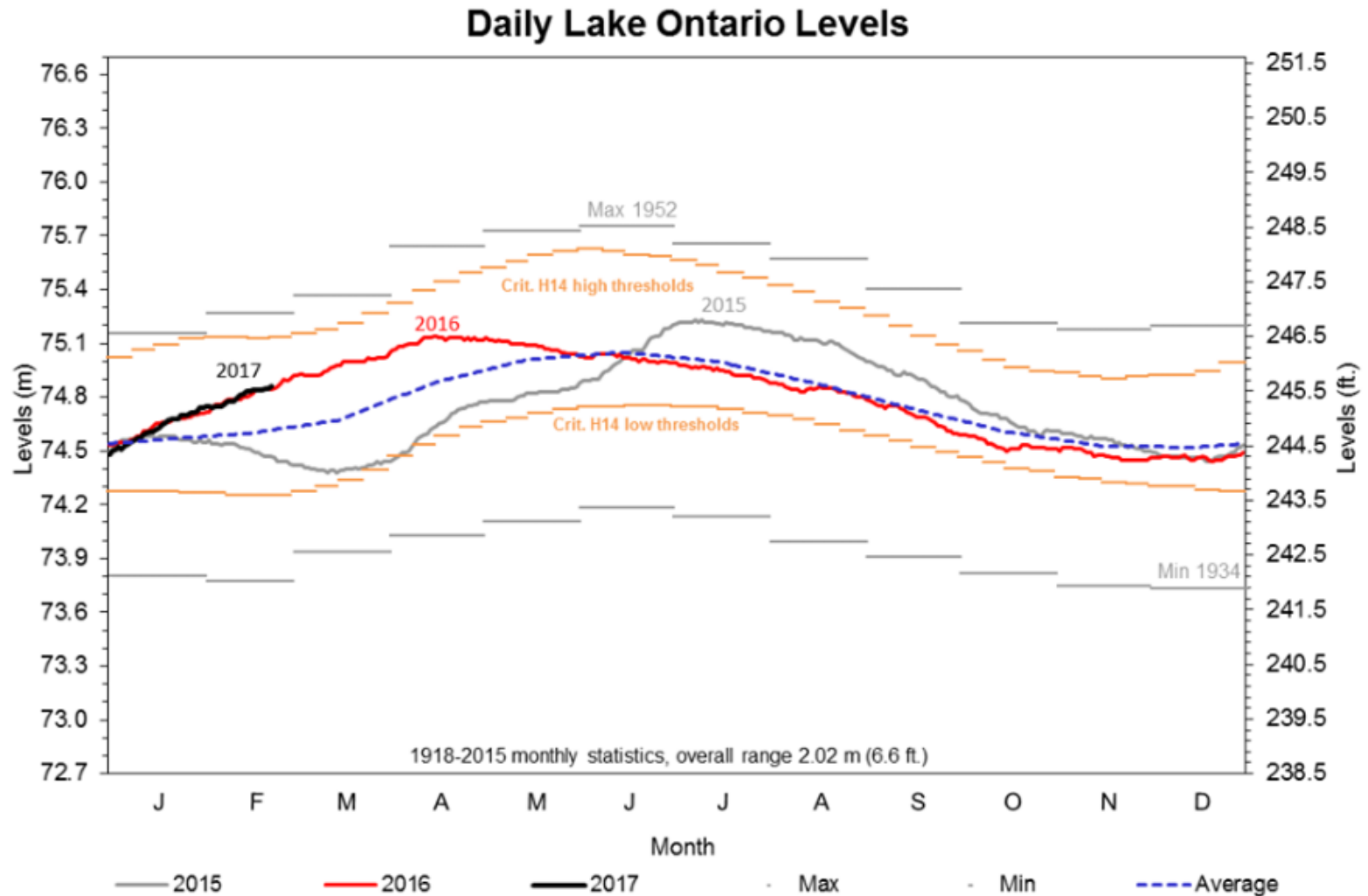


# Precipitation

## January through March

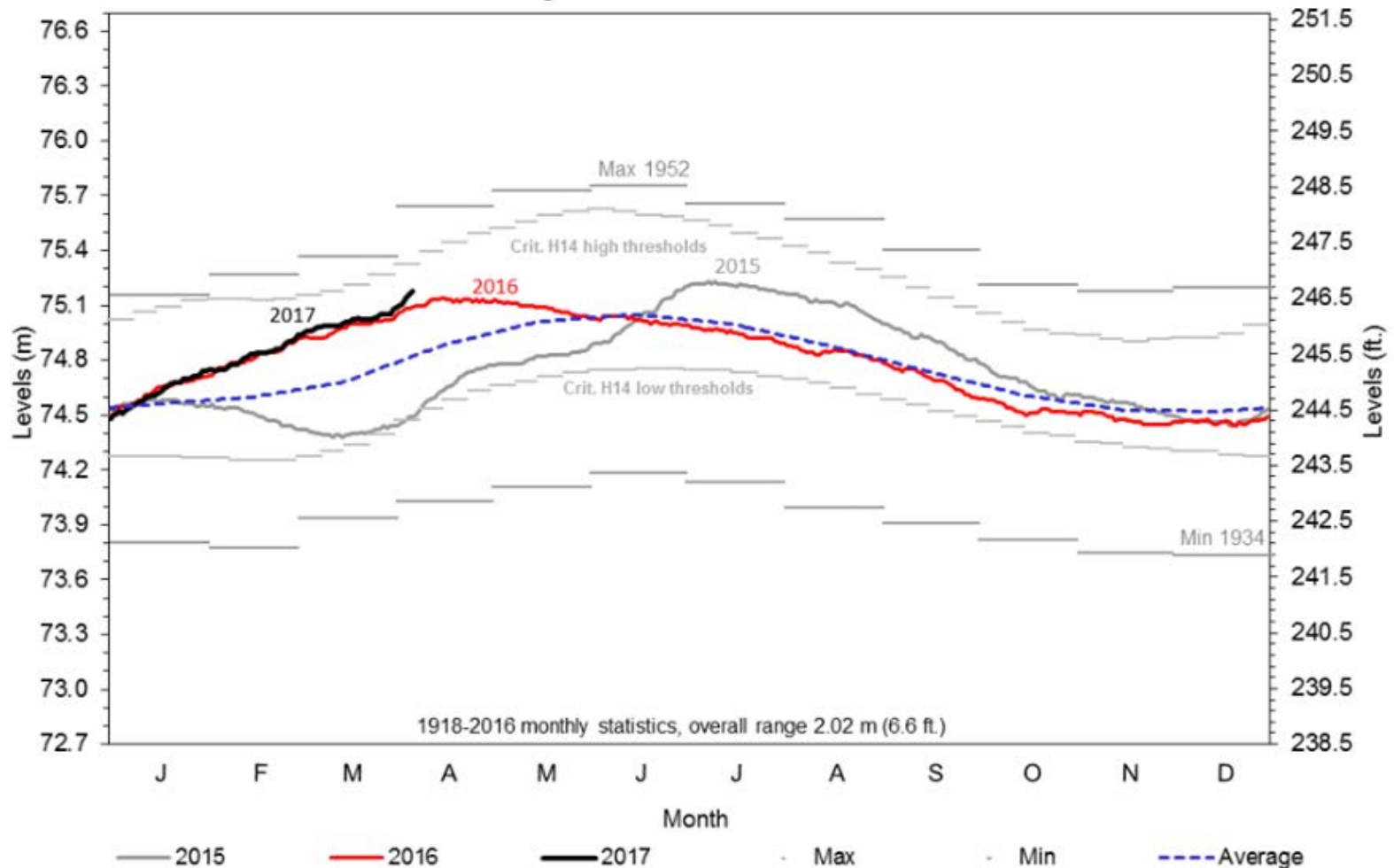


# End of February 2017

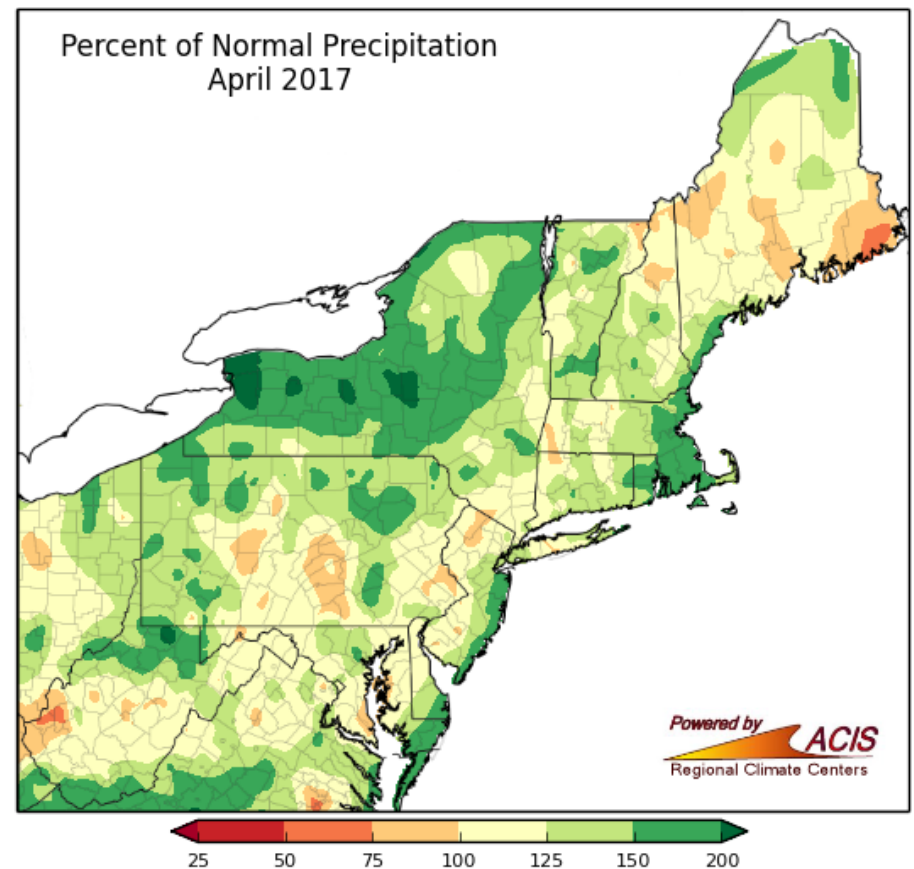
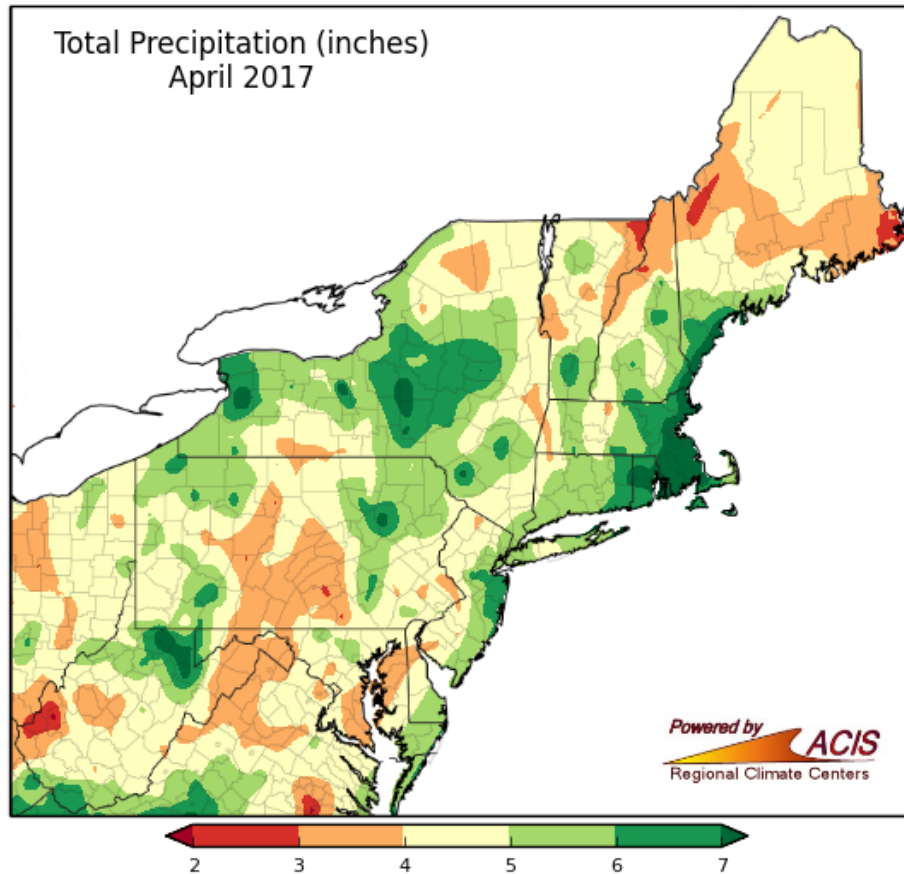


# End of March 2017

## Daily Lake Ontario Levels

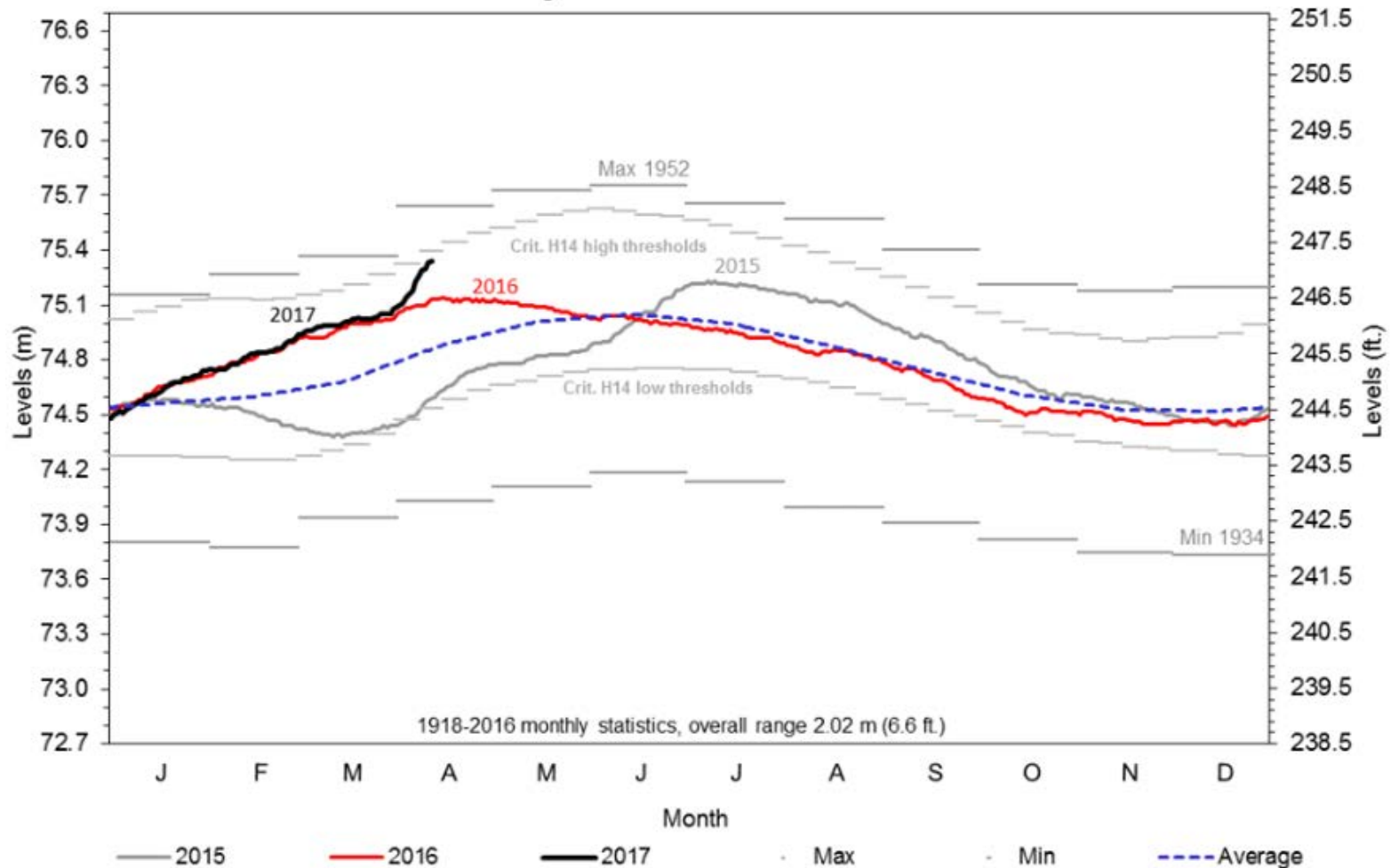


# Precipitation April



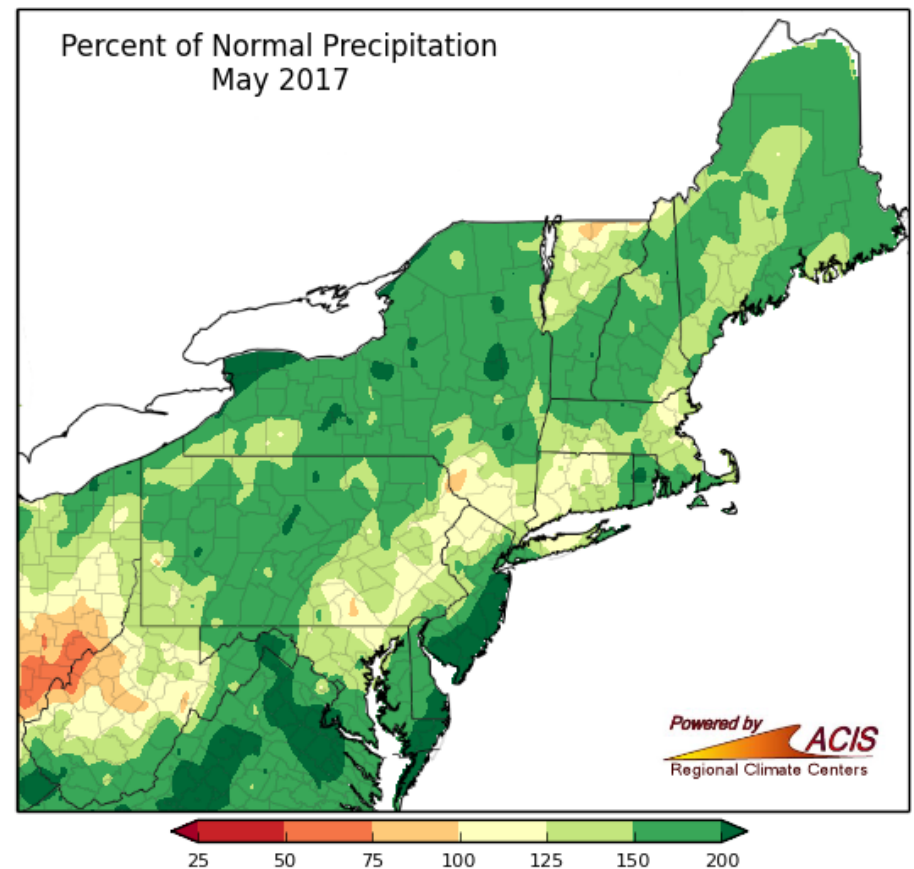
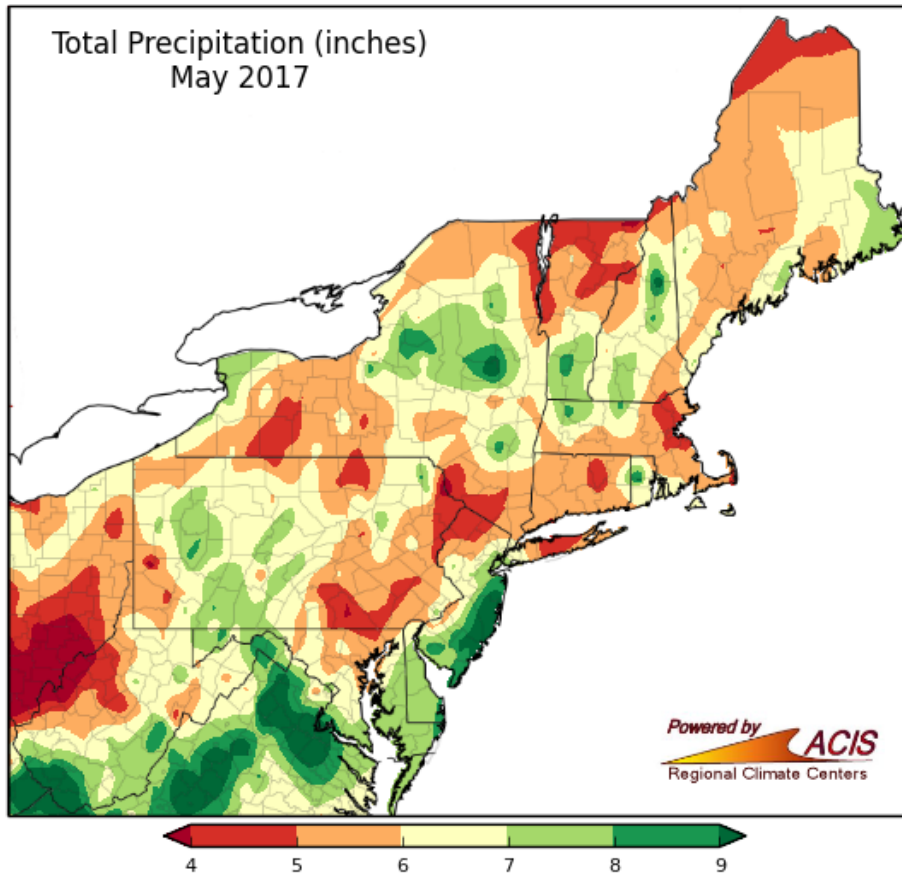
# Mid April 2017

## Daily Lake Ontario Levels





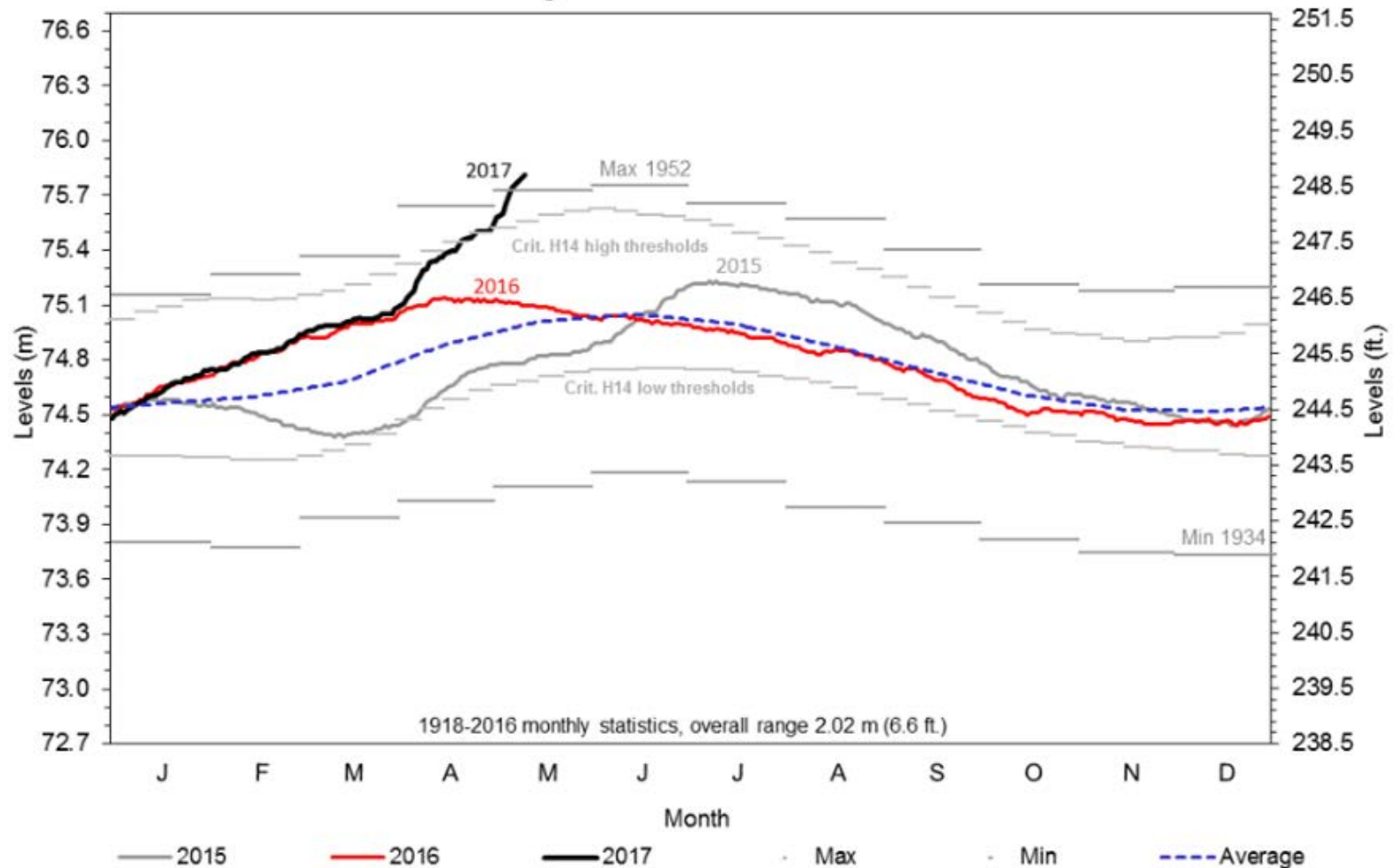
# Precipitation May





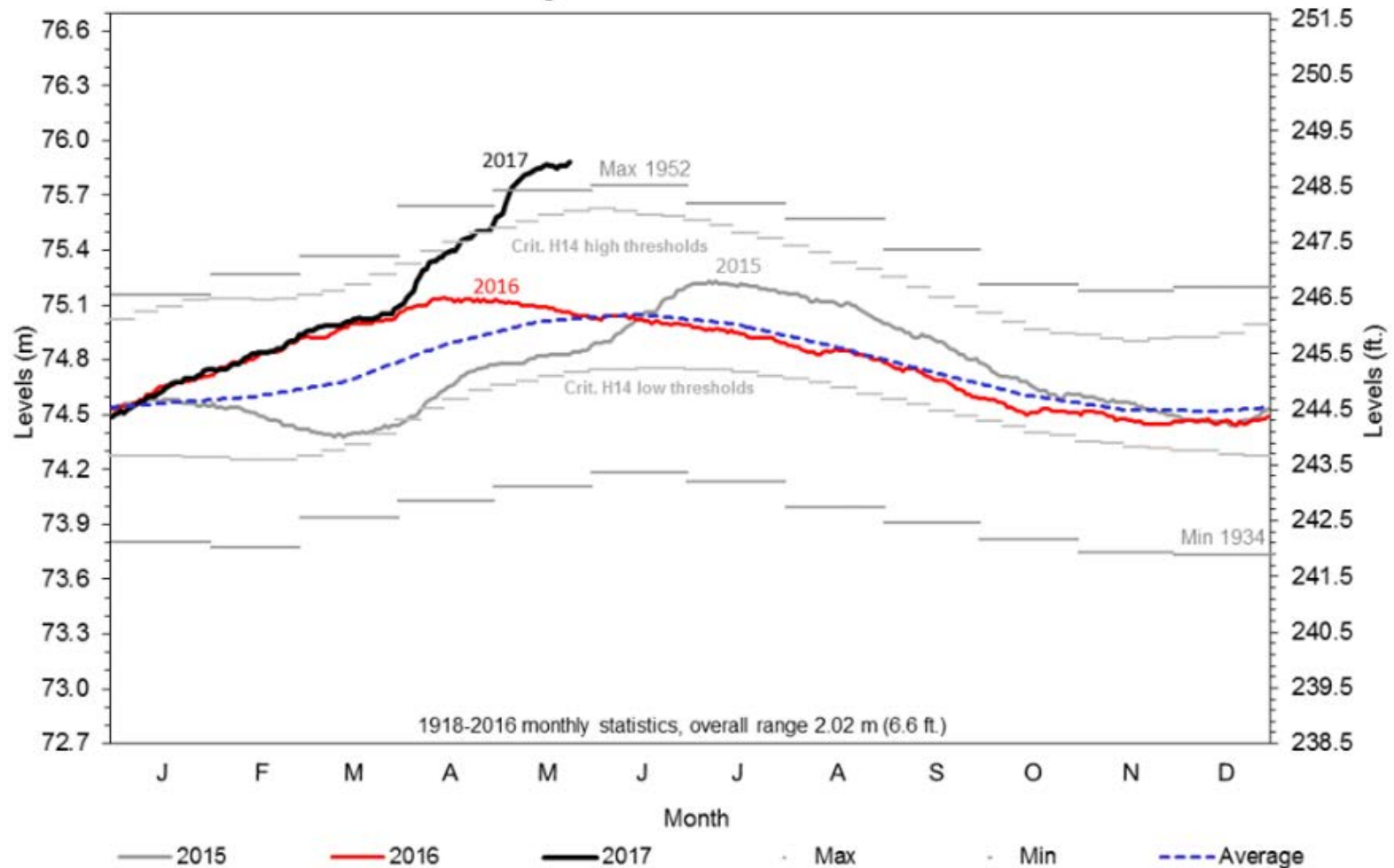
# Mid May 2017

## Daily Lake Ontario Levels



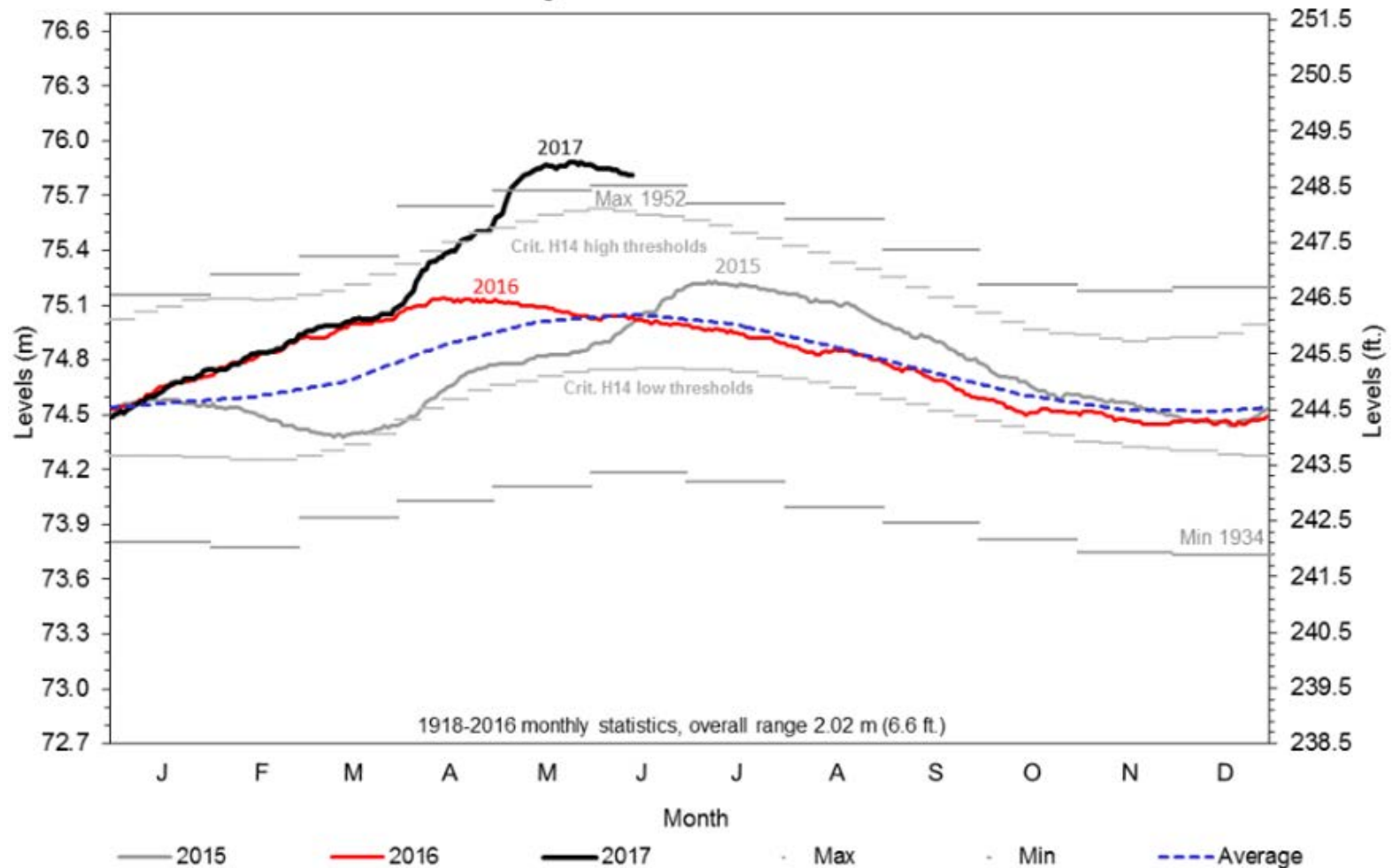
# End of May

## Daily Lake Ontario Levels



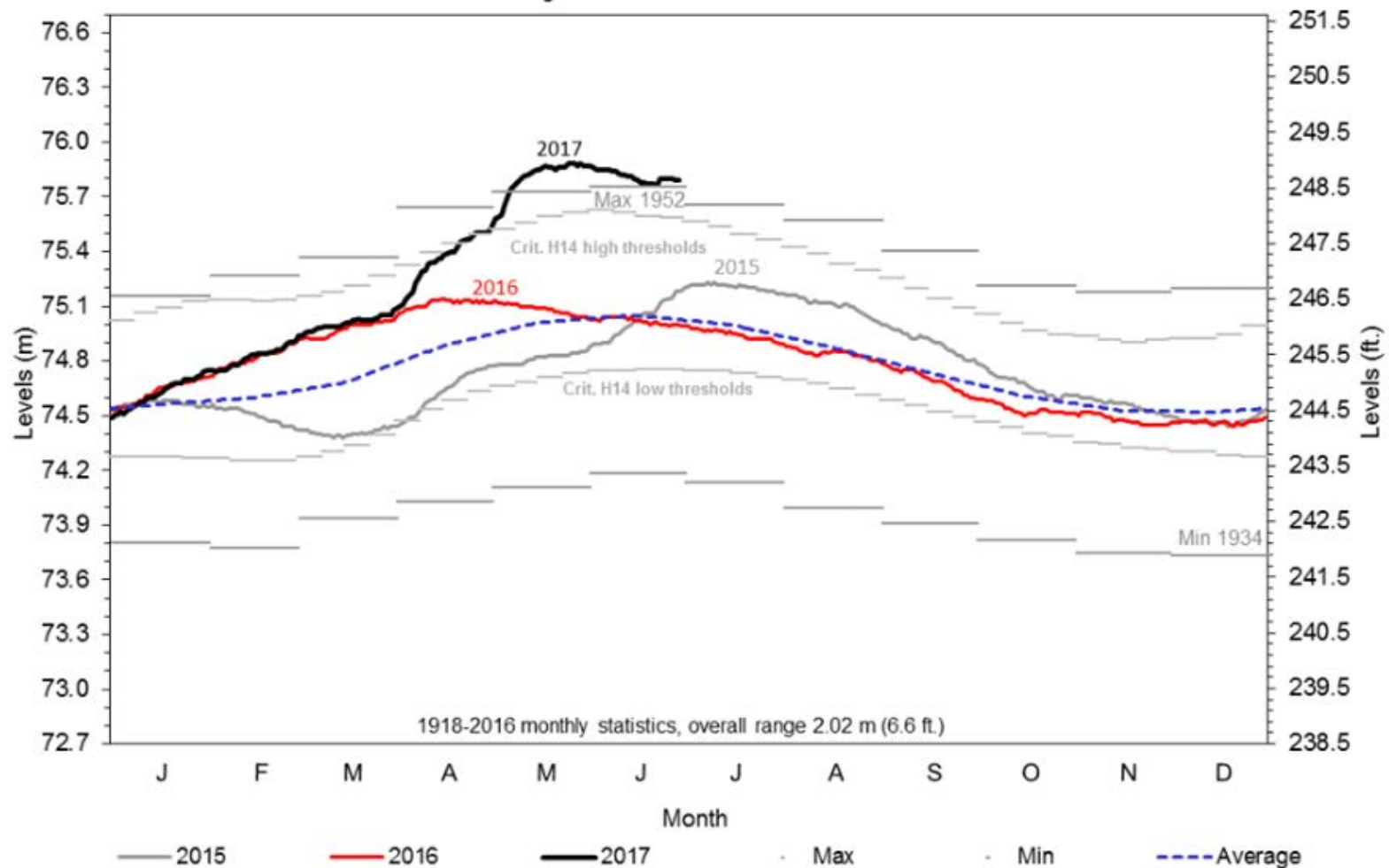
# Mid June

## Daily Lake Ontario Levels



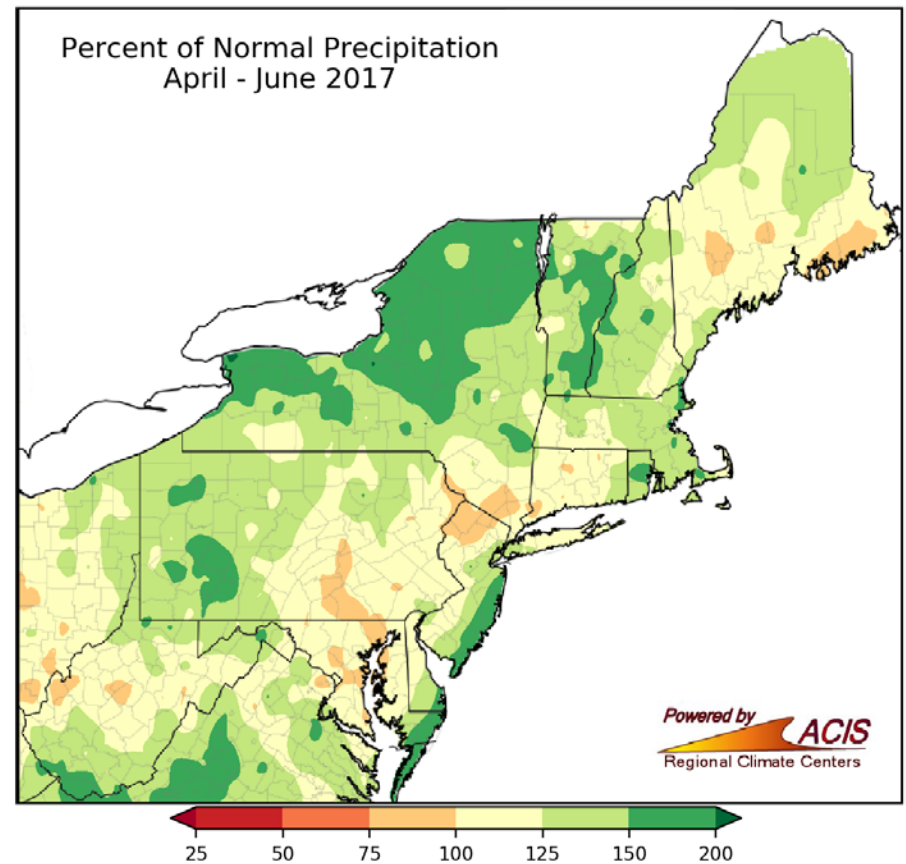
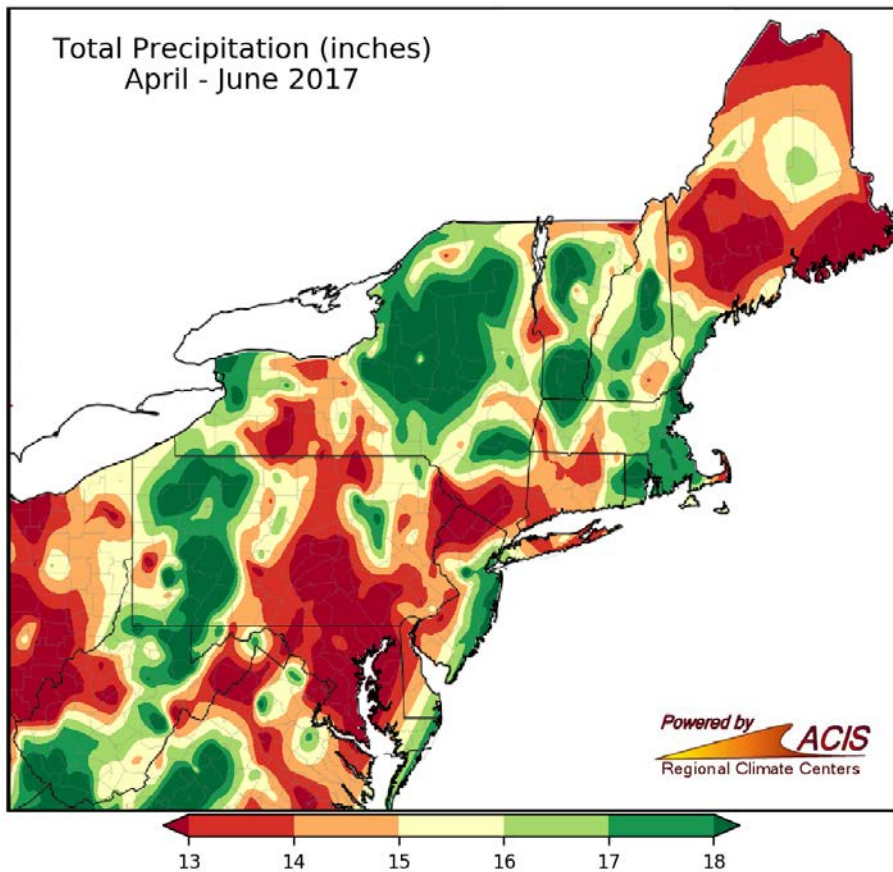
# End of June

## Daily Lake Ontario Levels



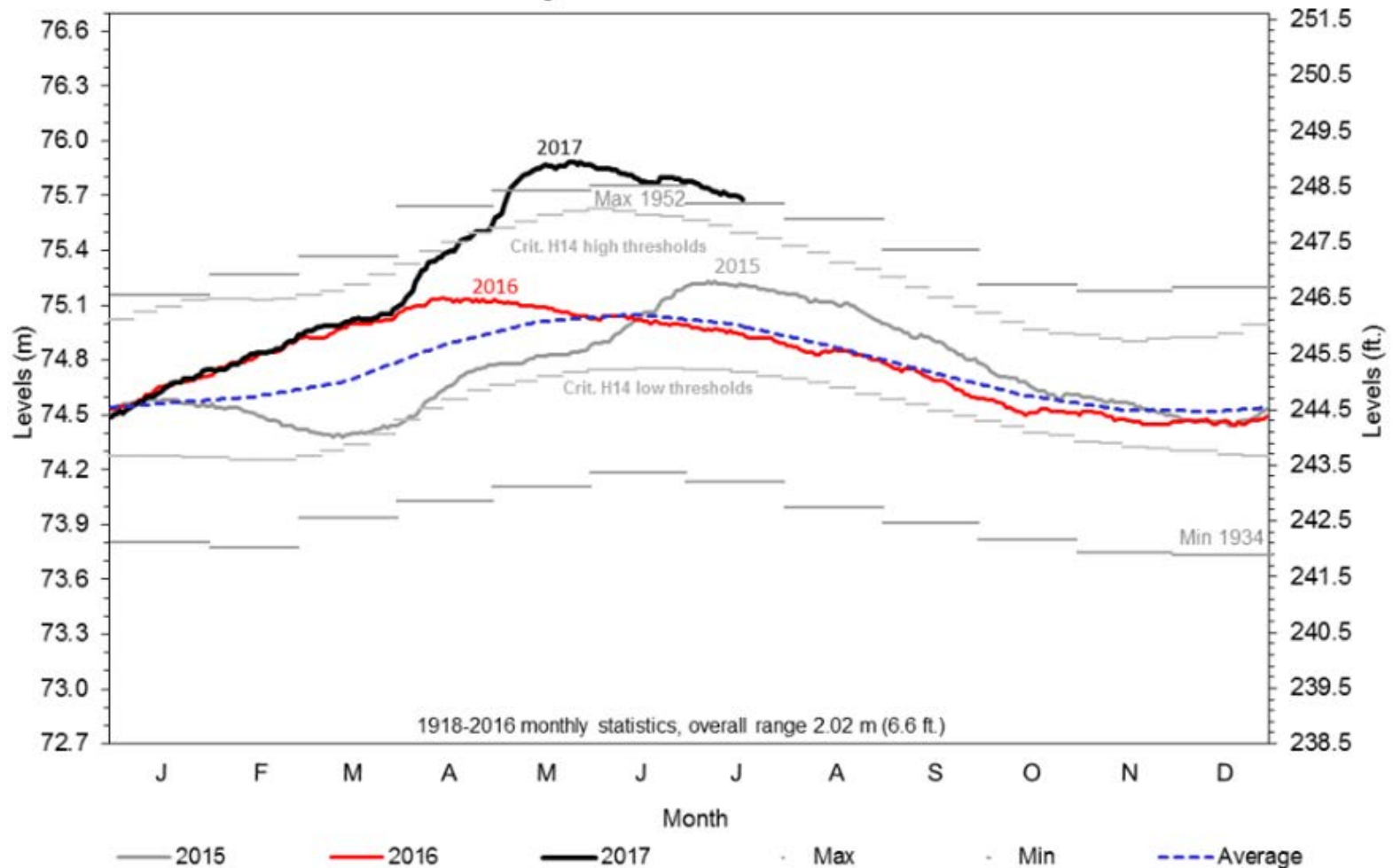
# Precipitation

## April through June



# Mid July

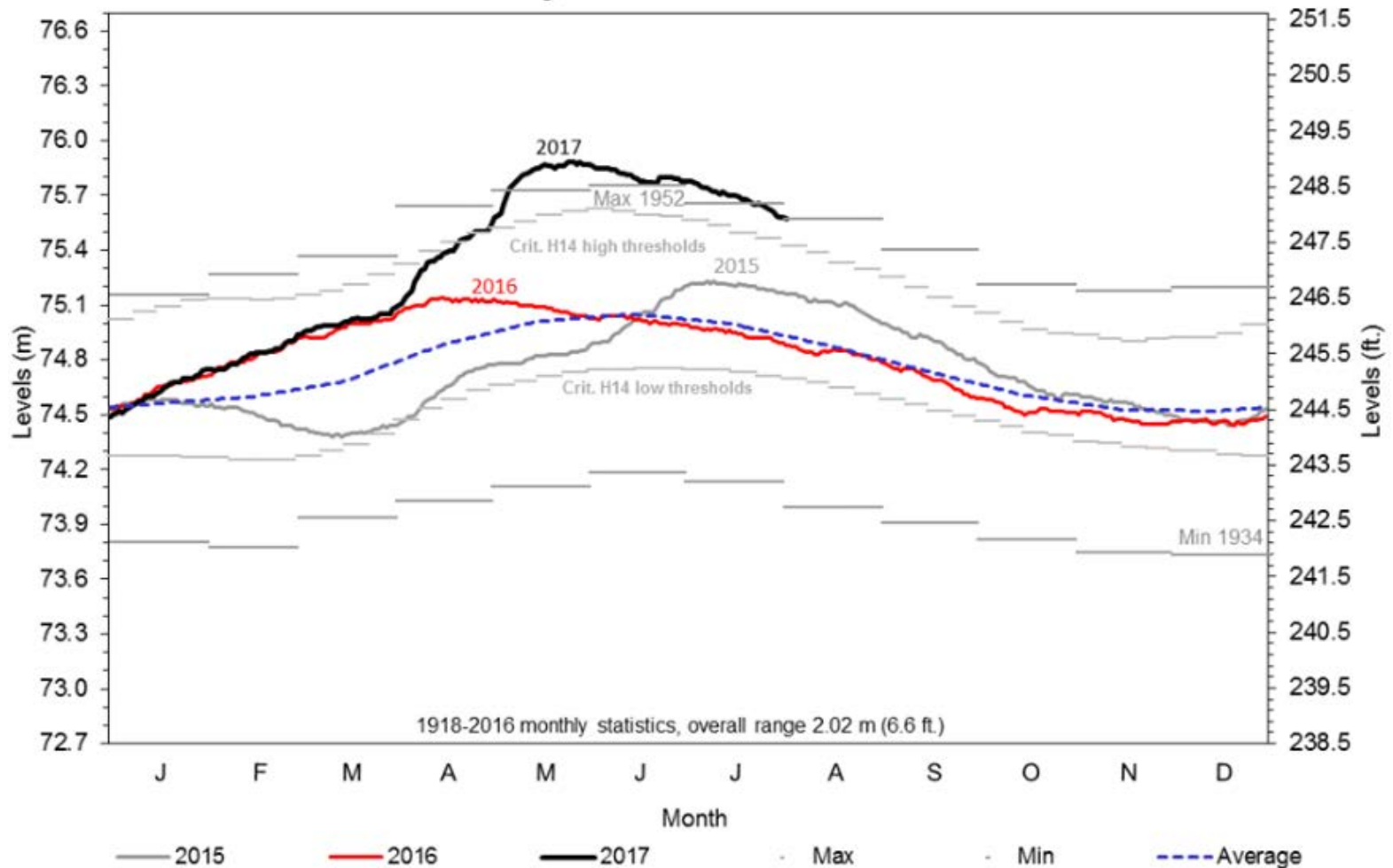
## Daily Lake Ontario Levels





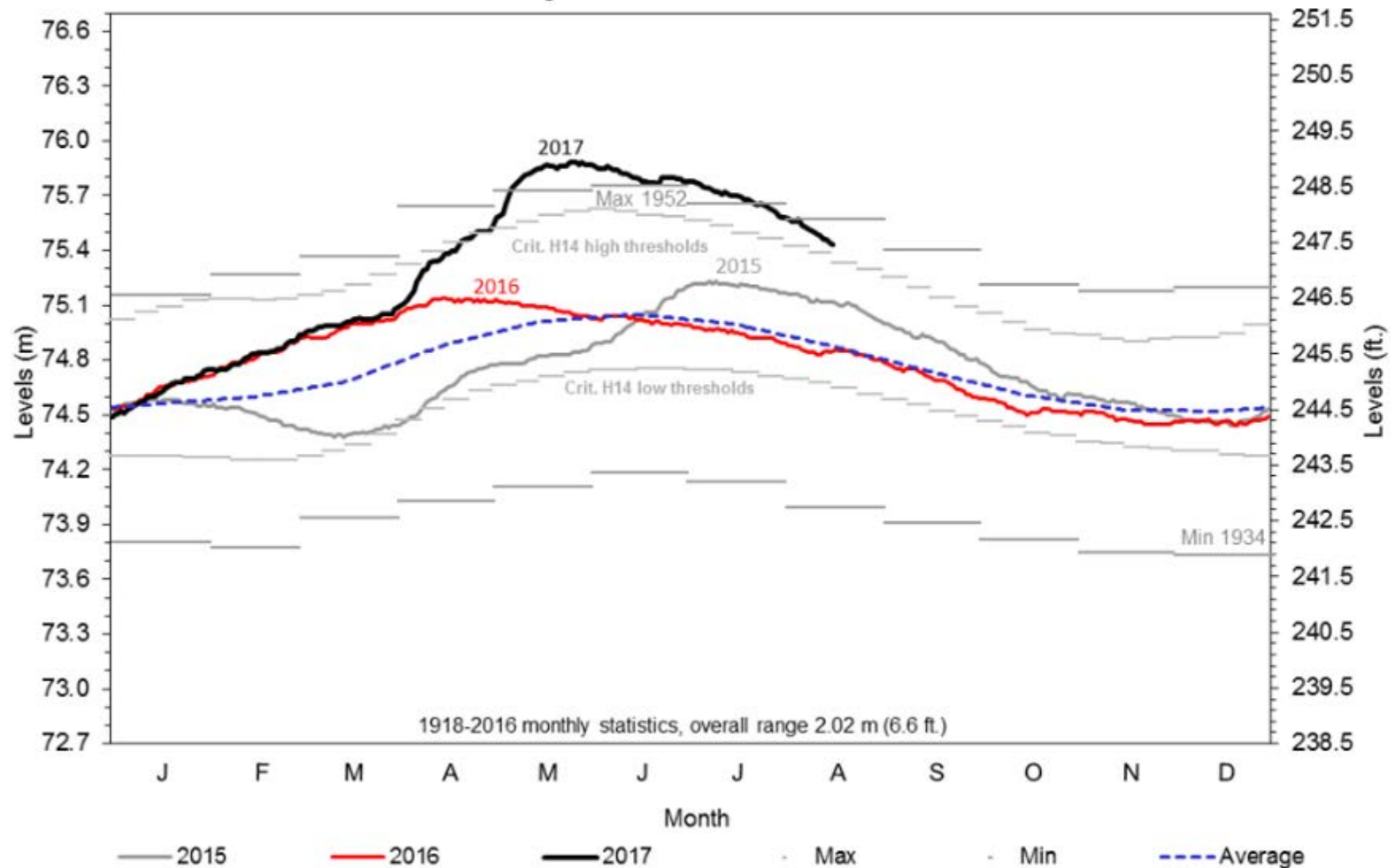
# Start of August

## Daily Lake Ontario Levels



# Mid August

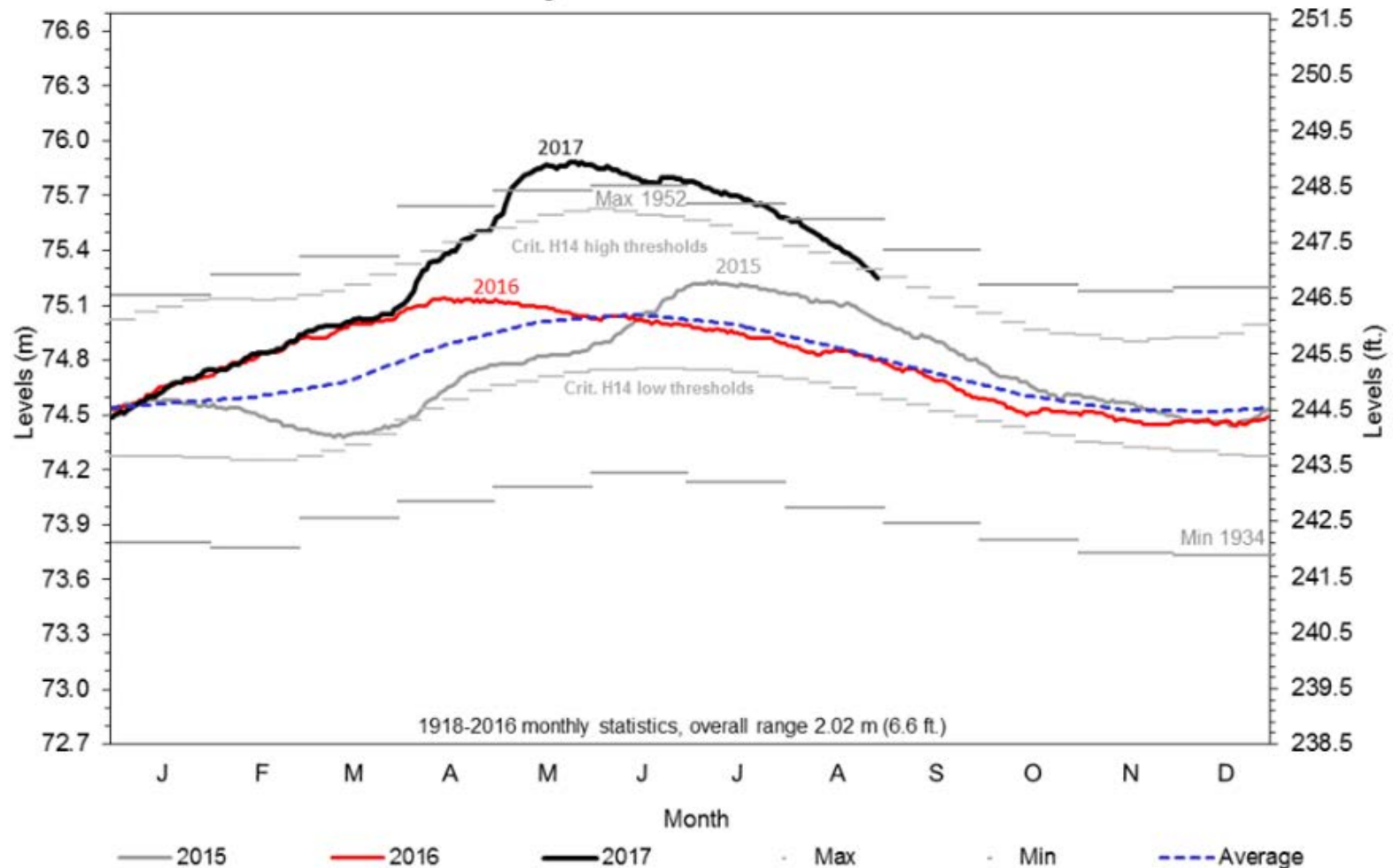
## Daily Lake Ontario Levels





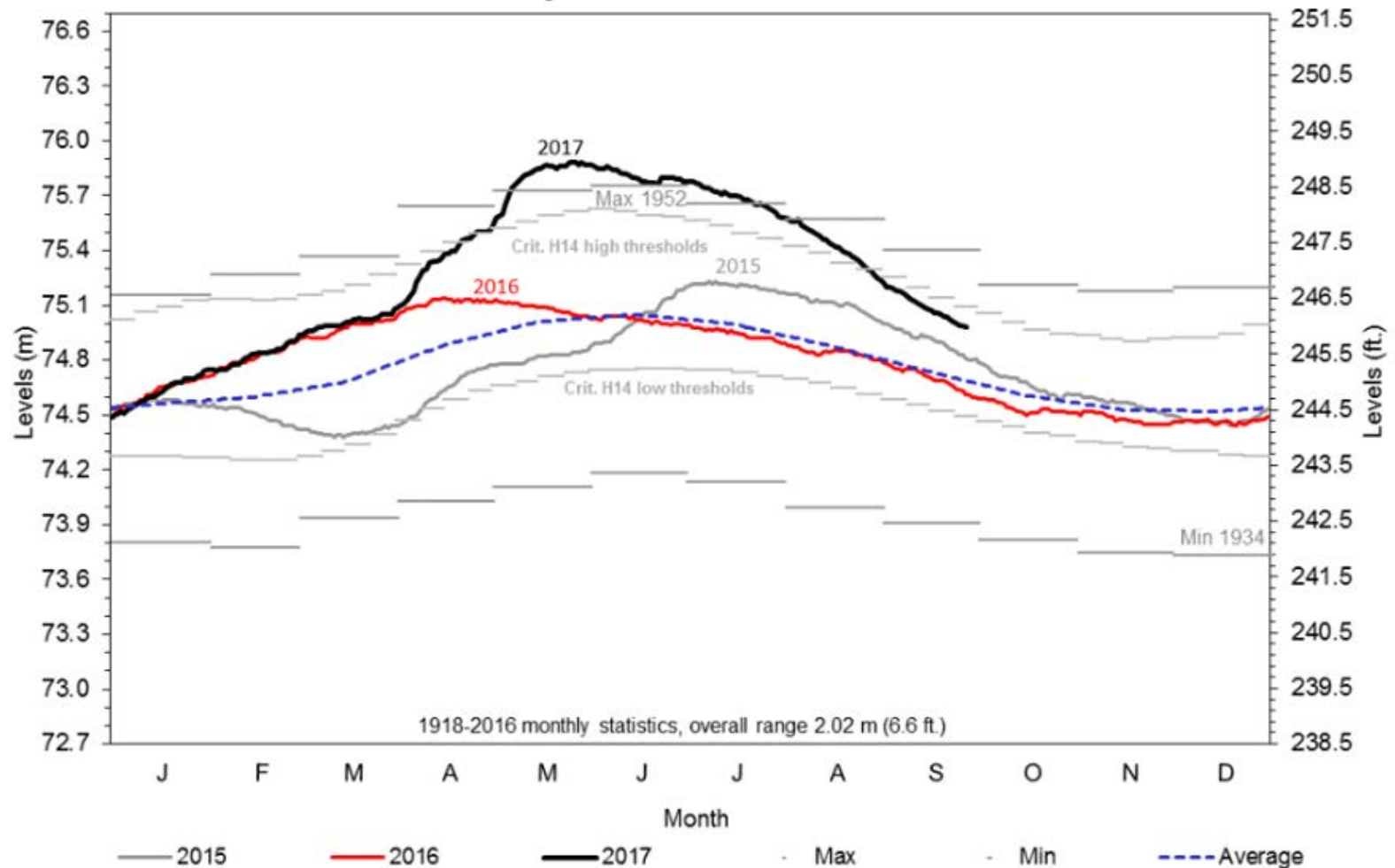
# End of August

## Daily Lake Ontario Levels



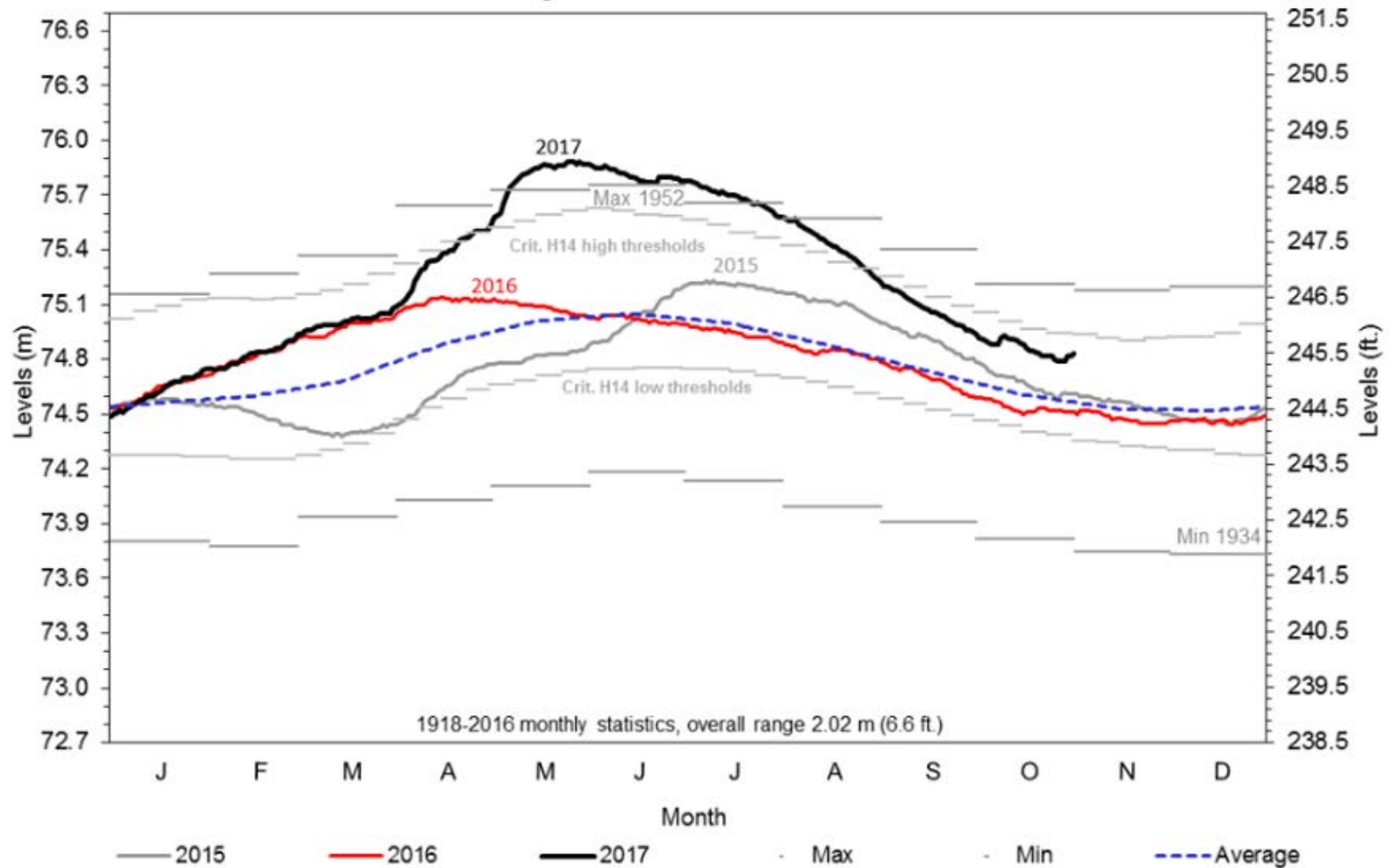
# End of September

## Daily Lake Ontario Levels



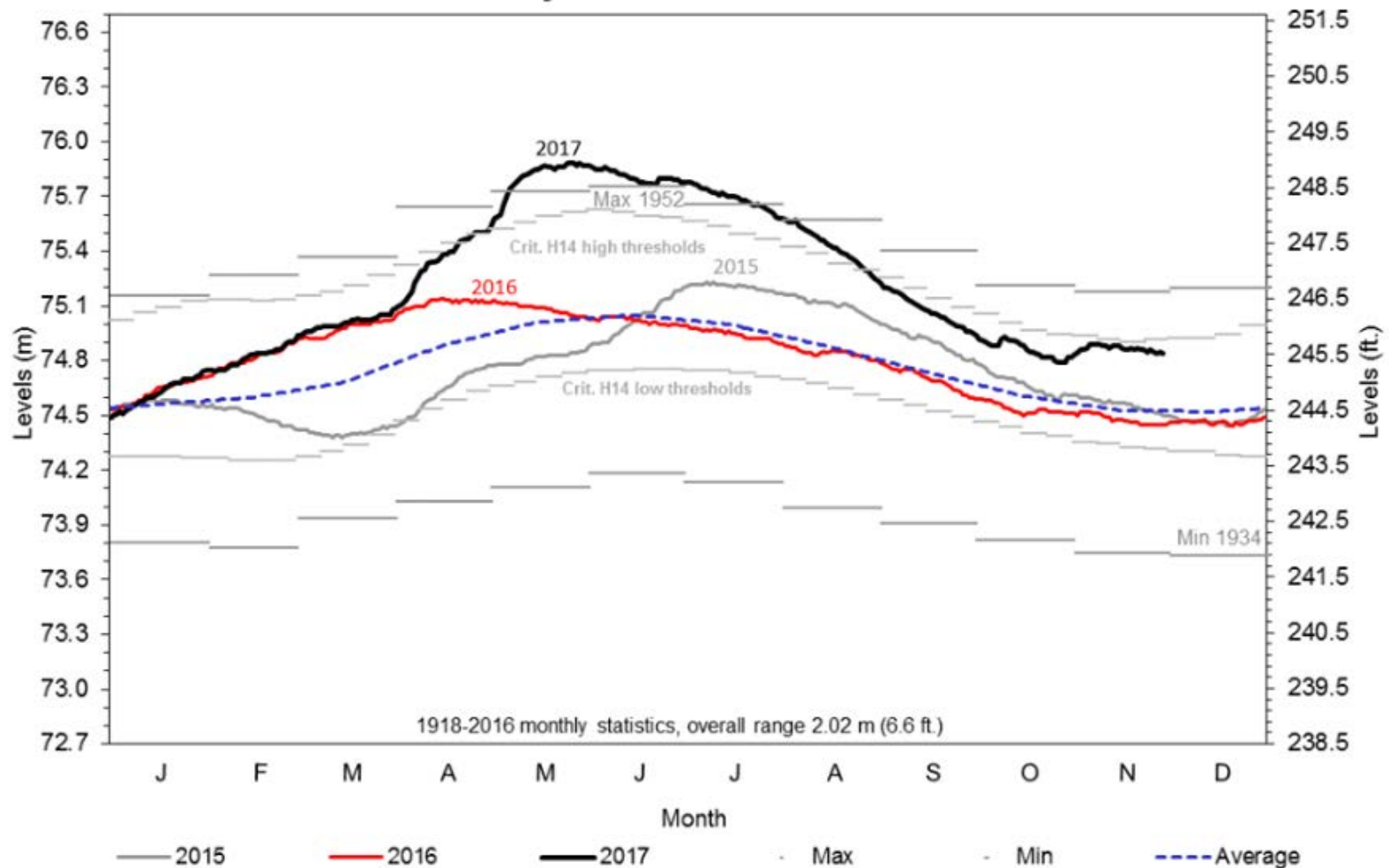
# End of October

## Daily Lake Ontario Levels



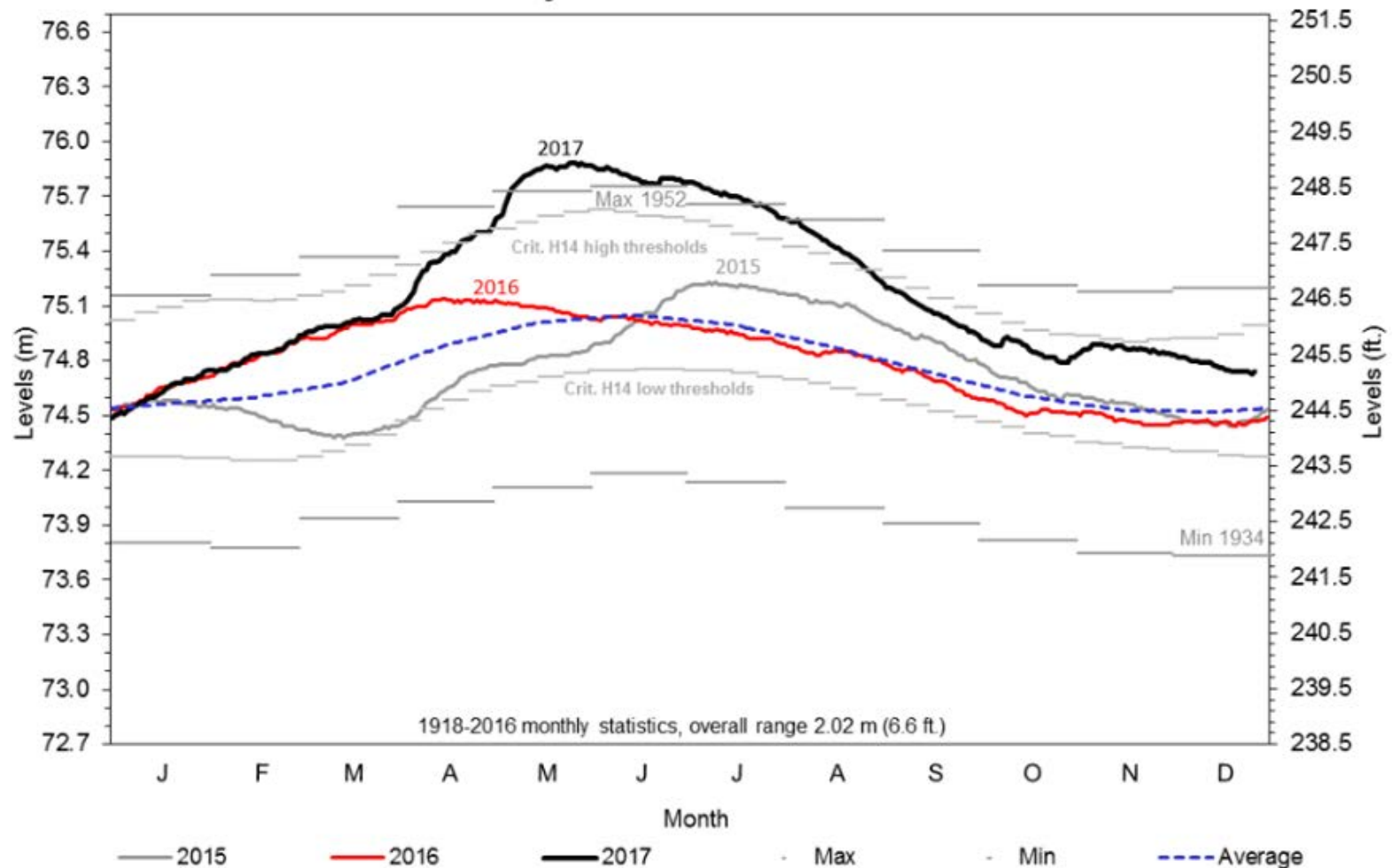
# End of November

## Daily Lake Ontario Levels



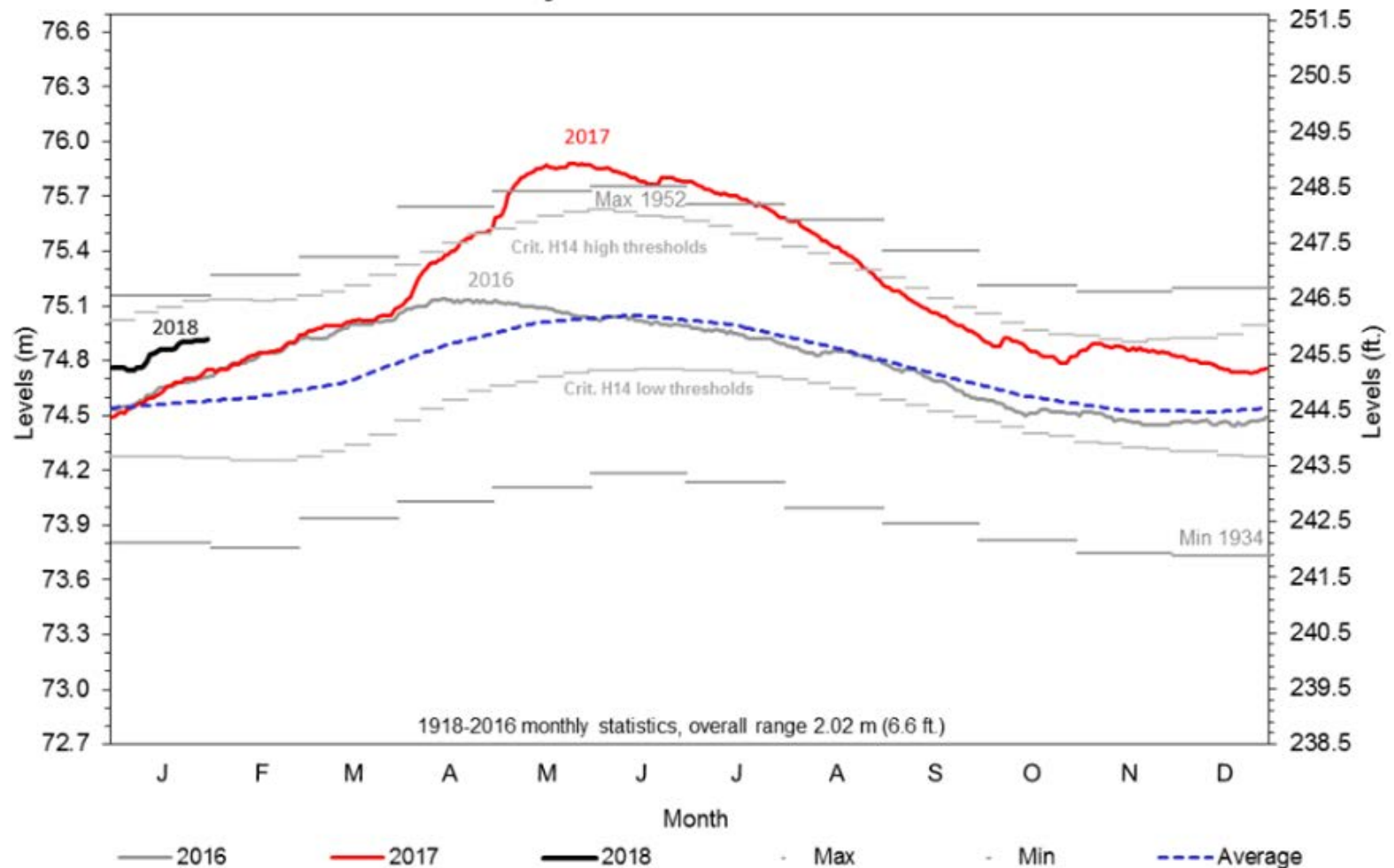
# End of December

## Daily Lake Ontario Levels



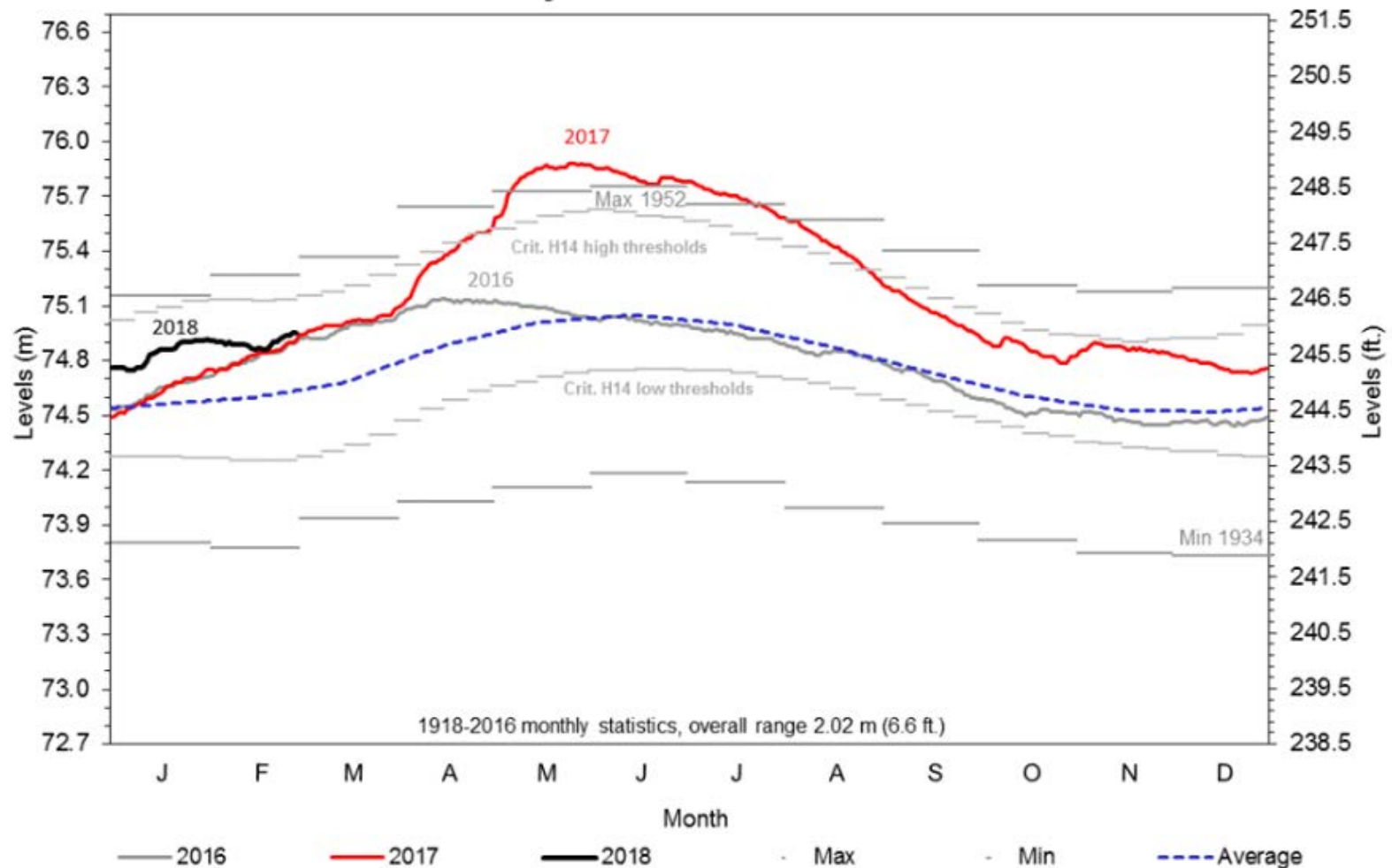
# End of January 2018

## Daily Lake Ontario Levels



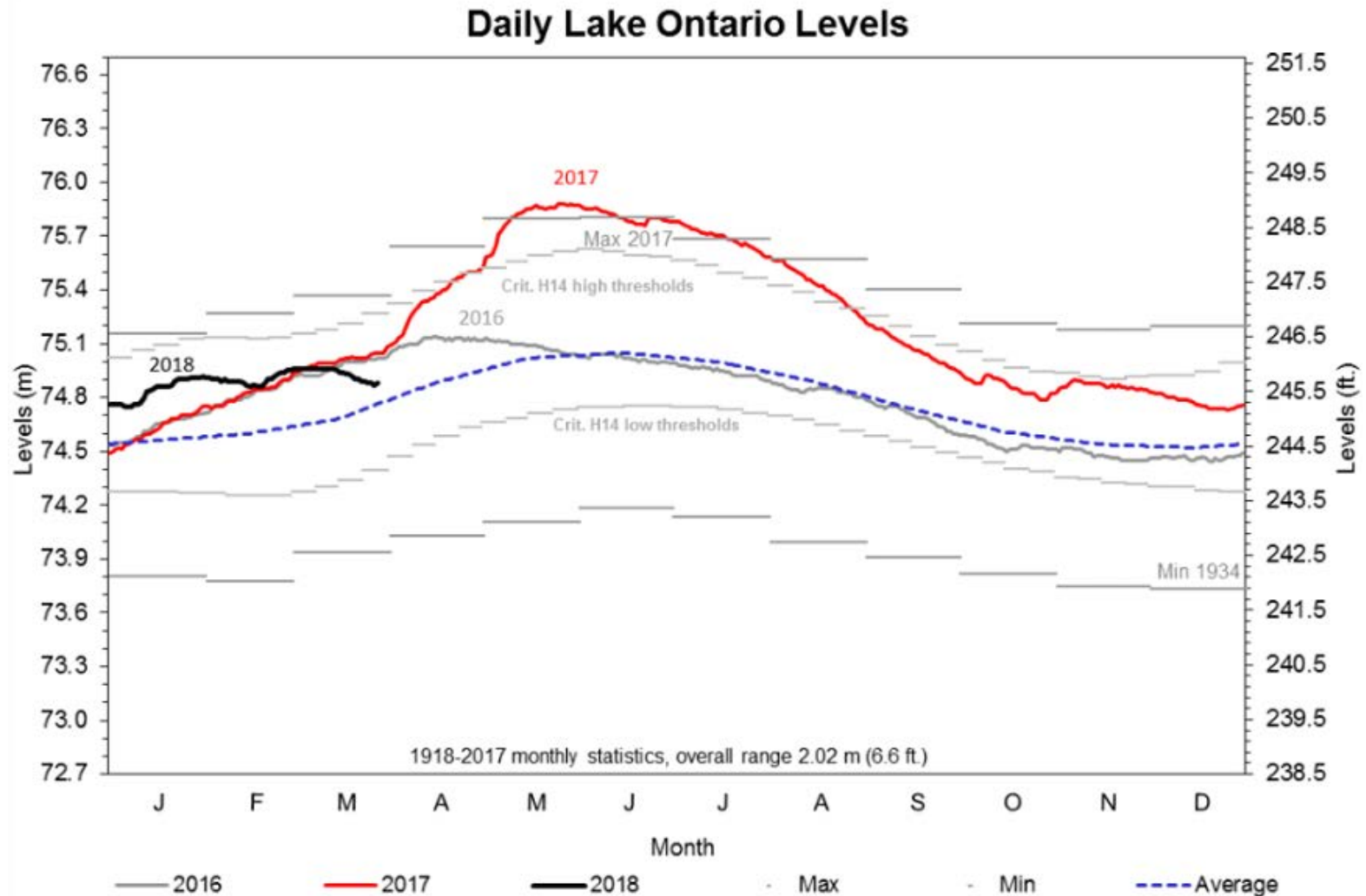
# End of February 2018

## Daily Lake Ontario Levels





# End of March 2018





# NWS Support

- \* Coastal Flood Warnings
- \* Special and Routine Briefings
- \* Conference Calls
- \* Support to New York State / FEMA for declarations

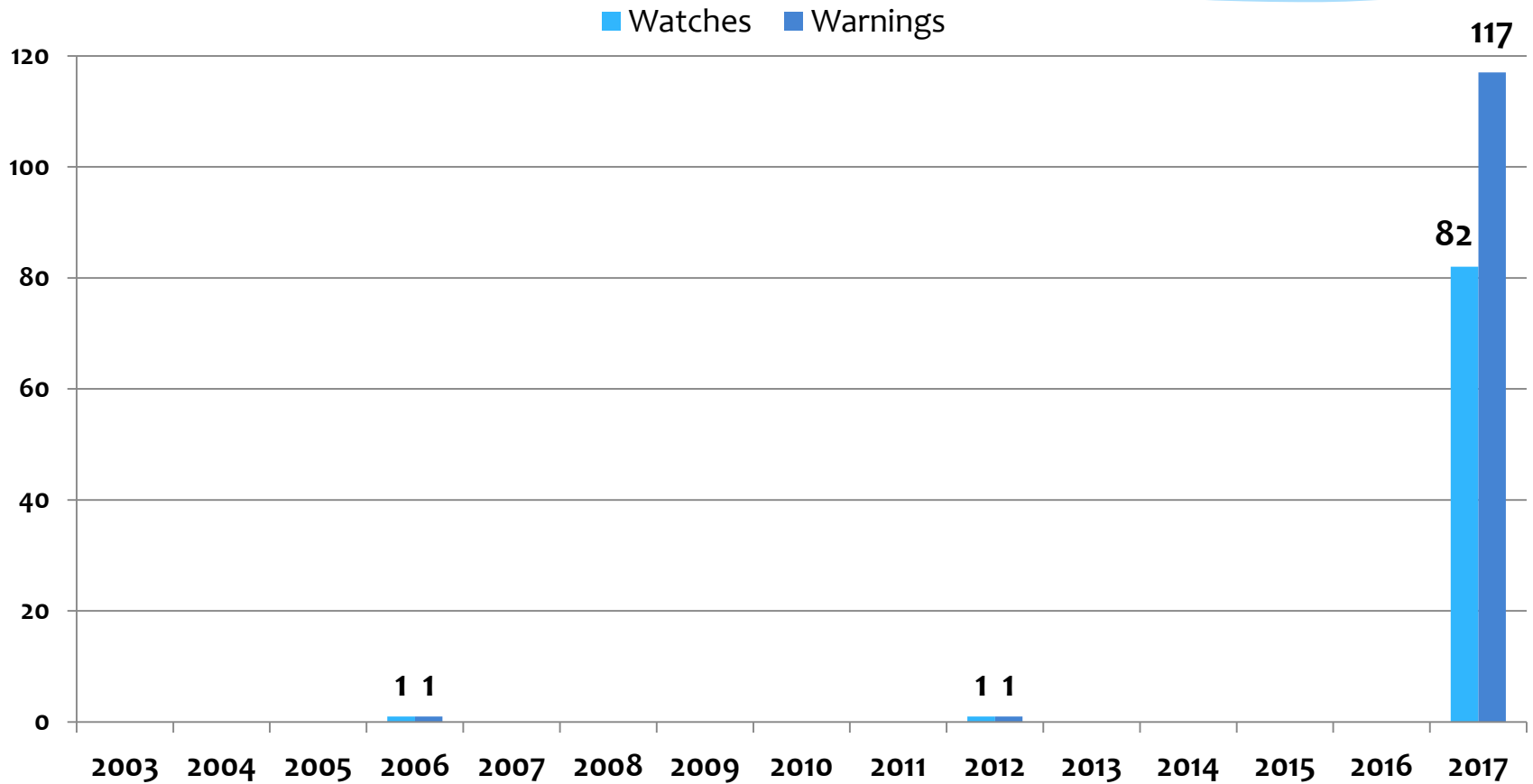
# Briefings

- \* First request for briefing came on April 10, 2017
- \* May 4, 2017: WFO Buffalo began issuing “routine” weather briefings for Lake Ontario every other day
  - \* Briefings were updated daily when headlines were up
- \* September 13, 2017: Frequency of briefings cut back to twice weekly (Monday and Thursday)
- \* December 4, 2017: “Routine” briefings discontinued

# Coastal Flood Warnings

- \* Historically, issued for Lake Ontario during periods of high water or persistent strong winds
  - \* Generally at the request of Emergency Management
- \* May 2017: Criteria established based on combination of lake levels and shoreline wave heights
- \* December 2017: Criteria was adjusted as water levels receded

# Coastal Flood Headlines



# Stats

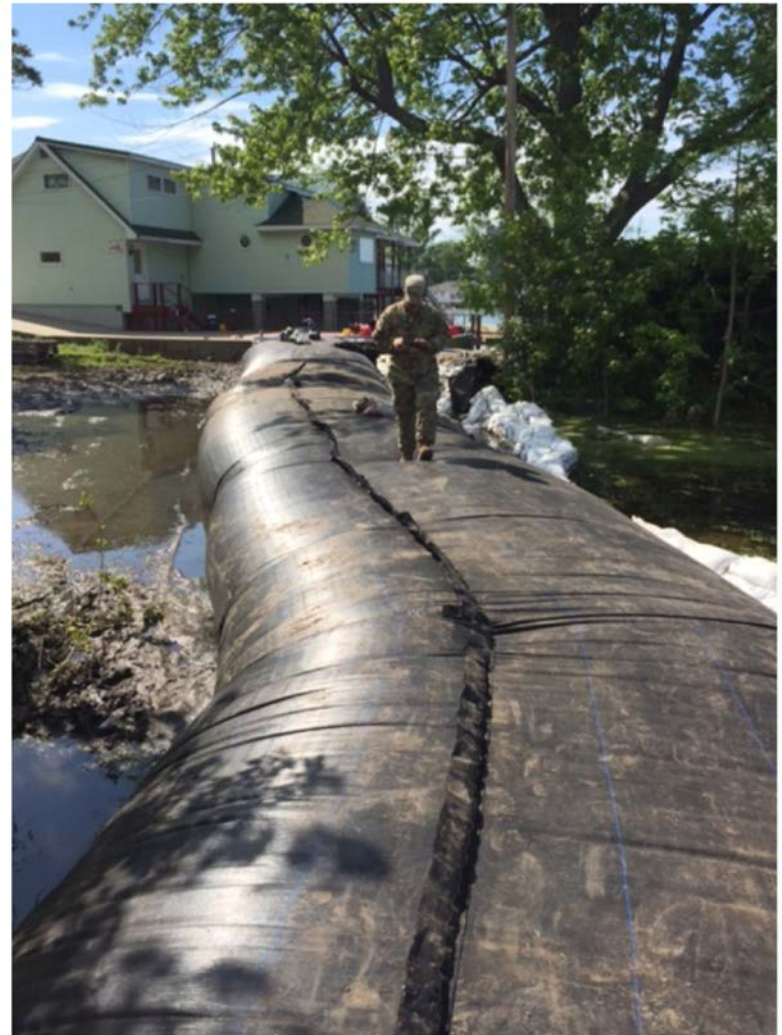
- \* State and Federal Disaster Declaration for eight New York Counties
  - \* Damages estimated between \$50 and \$100 Million
- \* Huge Economic Losses
- \* Over two million sandbags placed along the New York lake shore
- \* Aquadams and Tiger Dams also used

# Aquadams





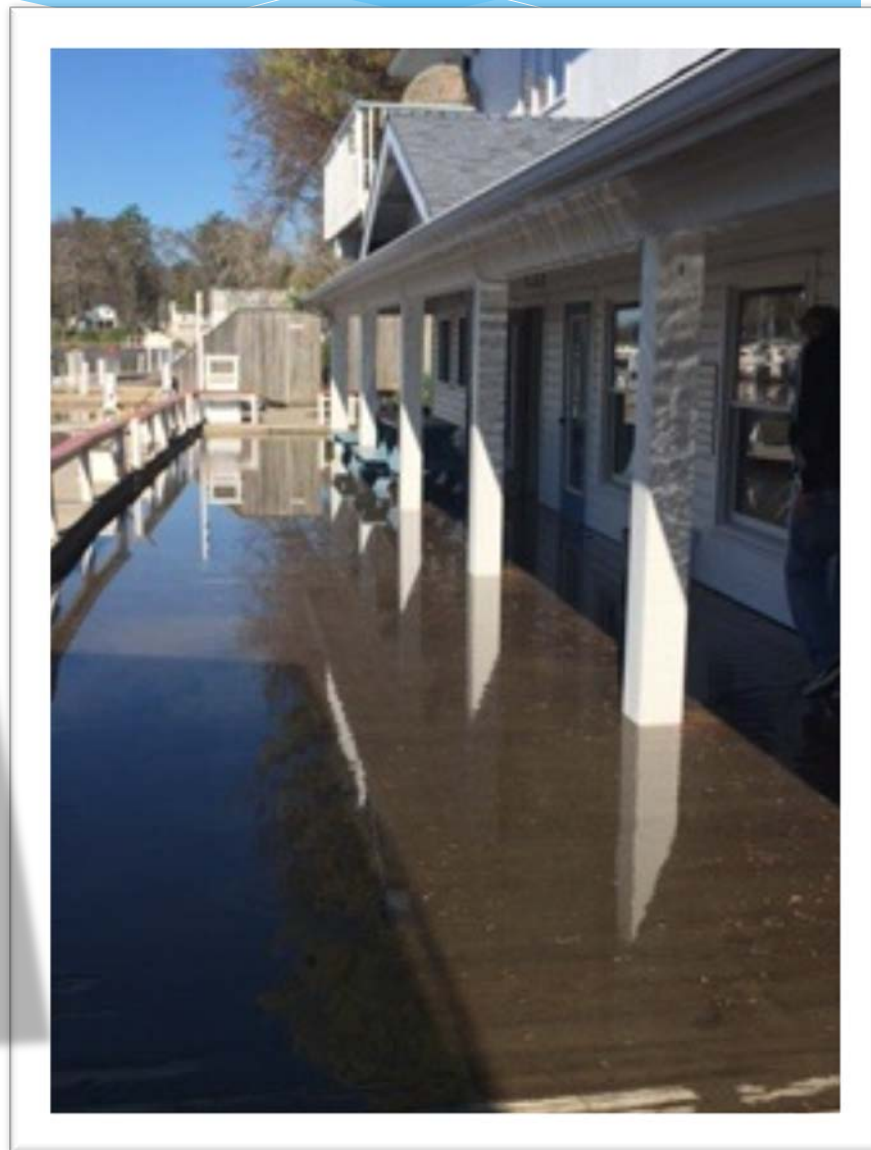
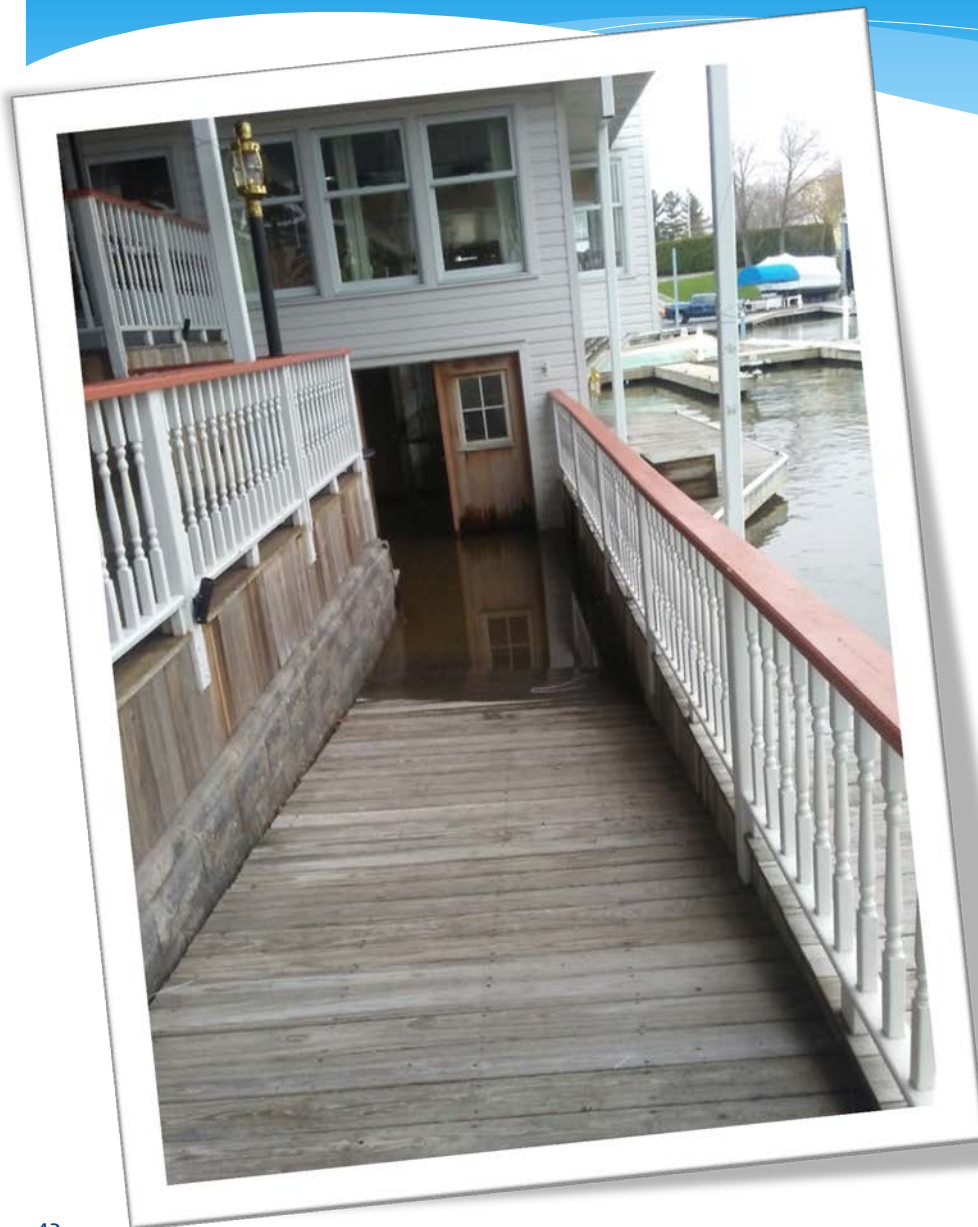
# Aquadams









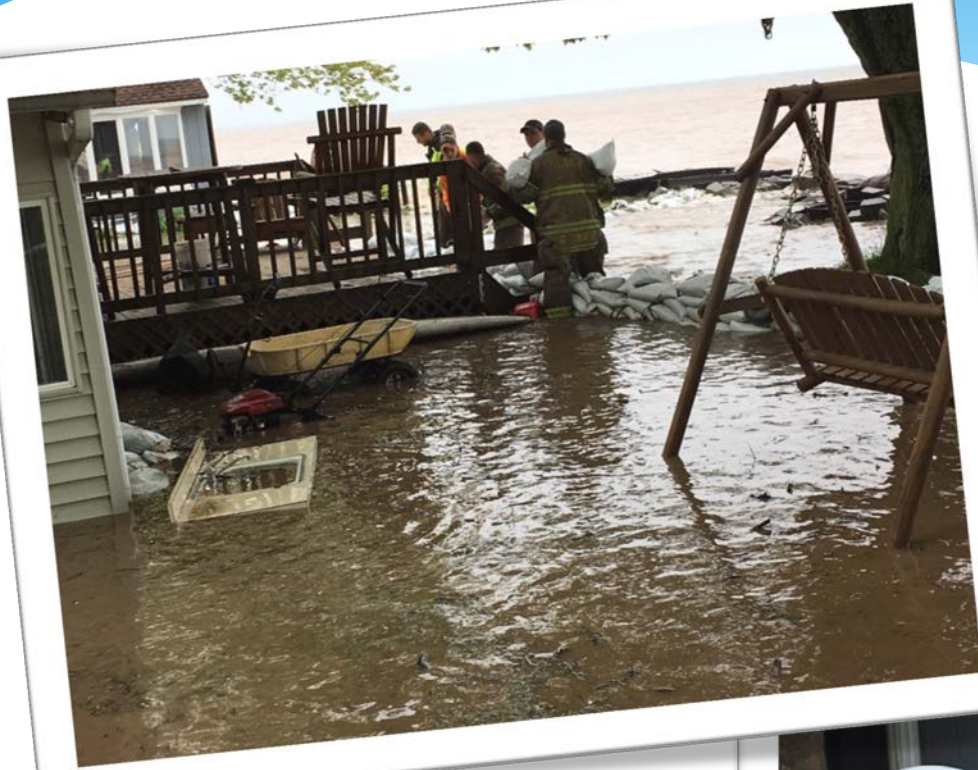








Yates Town Park, Orleans Co.



Carlton, Orleans Co.





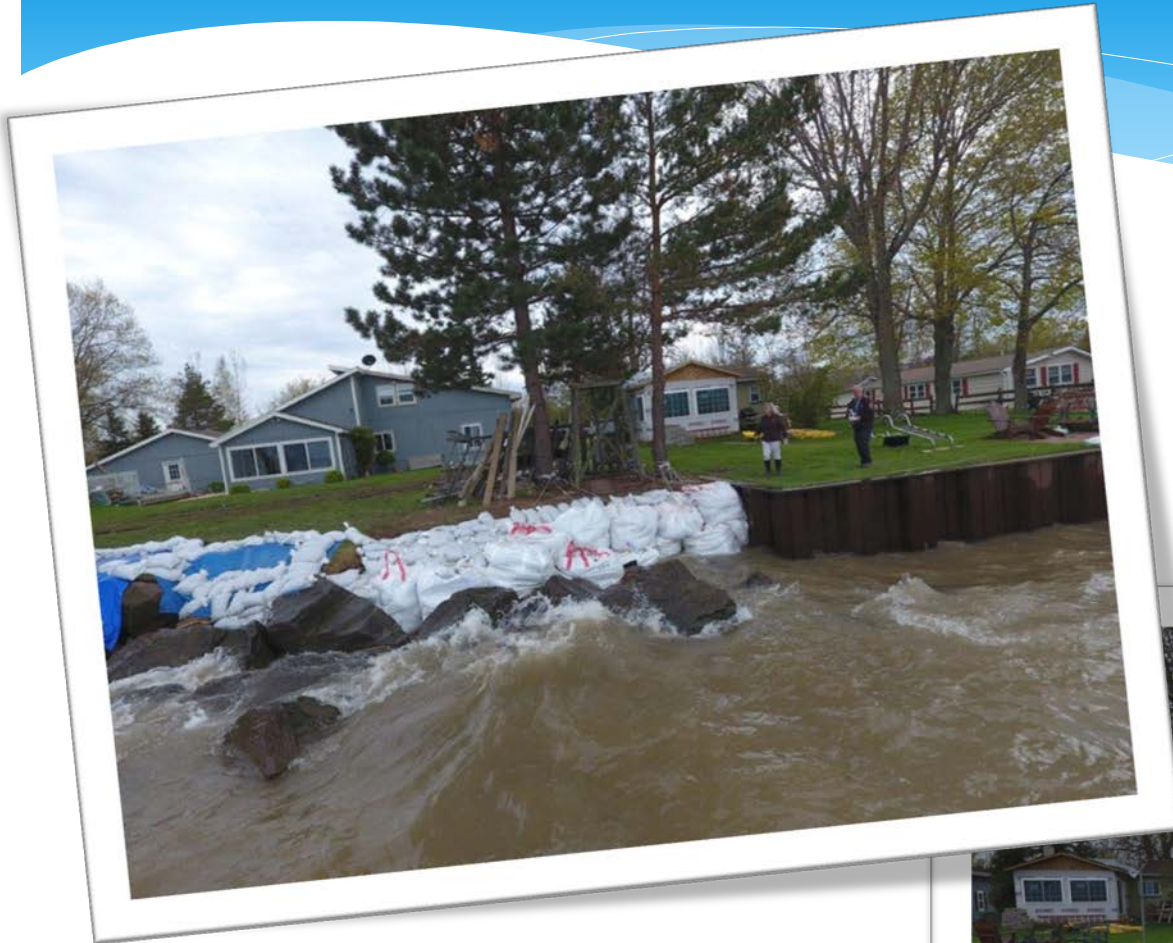


Kendall, Orleans Co.









Kendall, Orleans Co.





Oak Orchard Harbor, Orleans Co.









Sodus Point, Wayne Co.







Sodus Point, Wayne Co.







Mexico, Oswego Co.





Wrights Landing, Oswego Co.



Sandy Pond, Oswego Co.



Mexico, Oswego Co.







Sodus Point, Wayne Co.



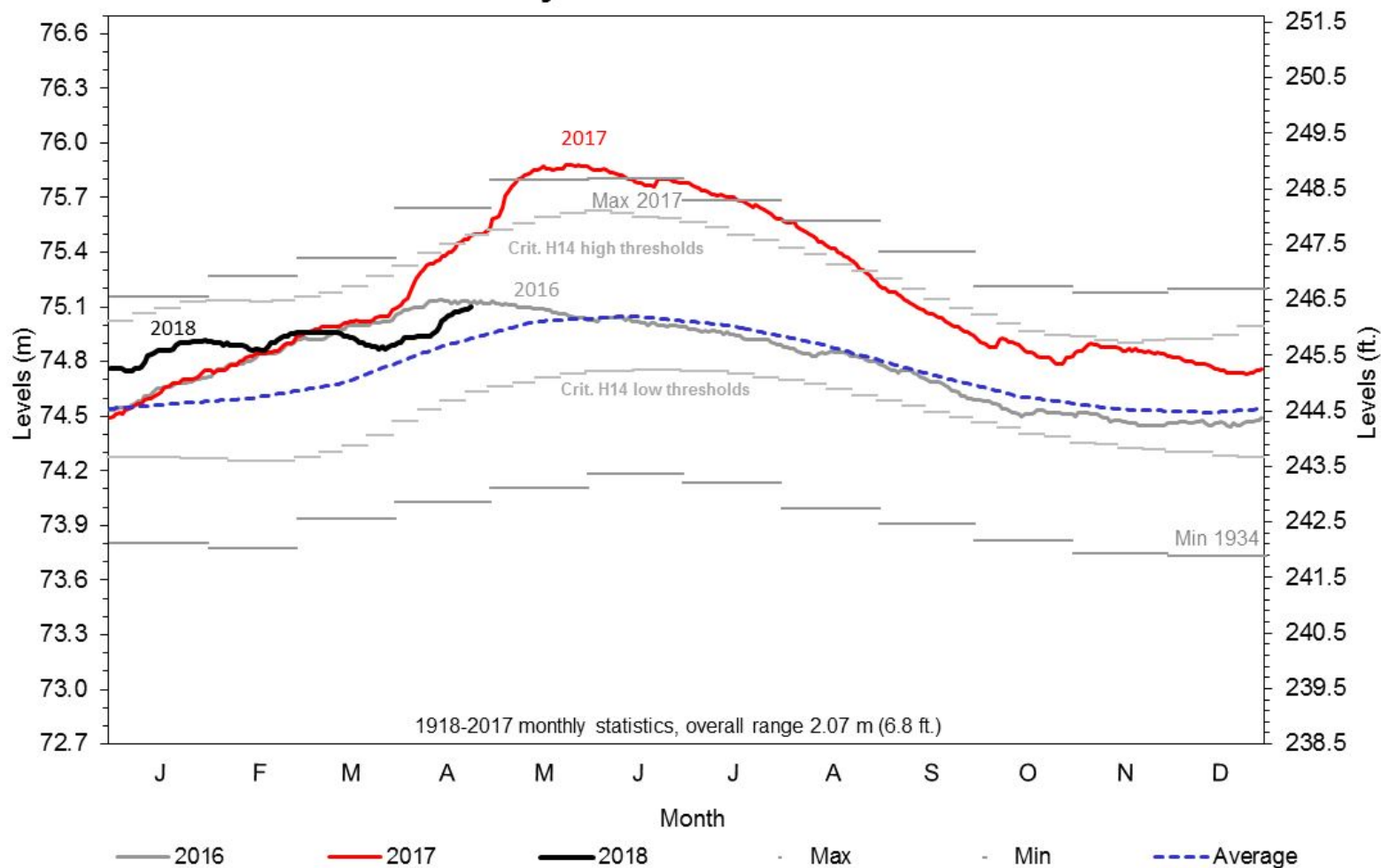


Sodus Point, Wayne Co.



# Most Recent – April 26 2018

## Daily Lake Ontario Levels



# Questions?

# Photo/Illustration Credits

- \* Jonathan Shultz, Niagara County Emergency Management
  - \* Slides 38-43
- \* Dale Banker, Orleans County Emergency Management
  - \* Slides 44-51
- \* George Bastedo, Wayne County Emergency Management
  - \* Slides 52-58
- \* Terry Bennett, Oswego County Emergency Management
  - \* Slides 58-62
- \* William Correa, New York Office of Emergency Management
  - \* Slides 63-64
- \* Daily Lake Level Charts: IJC/LOSLR Facebook Page
- \* Precipitation/Departure Charts: Northeast Regional Climate Center