The Housatonic and Connecticut River Ice Jams of January 2018

Britt Westergard
Senior Service Hydrologist
Albany, NY National Weather Service

Nicole Belk
Senior Service Hydrologist
Boston, MA National Weather Service

About Us

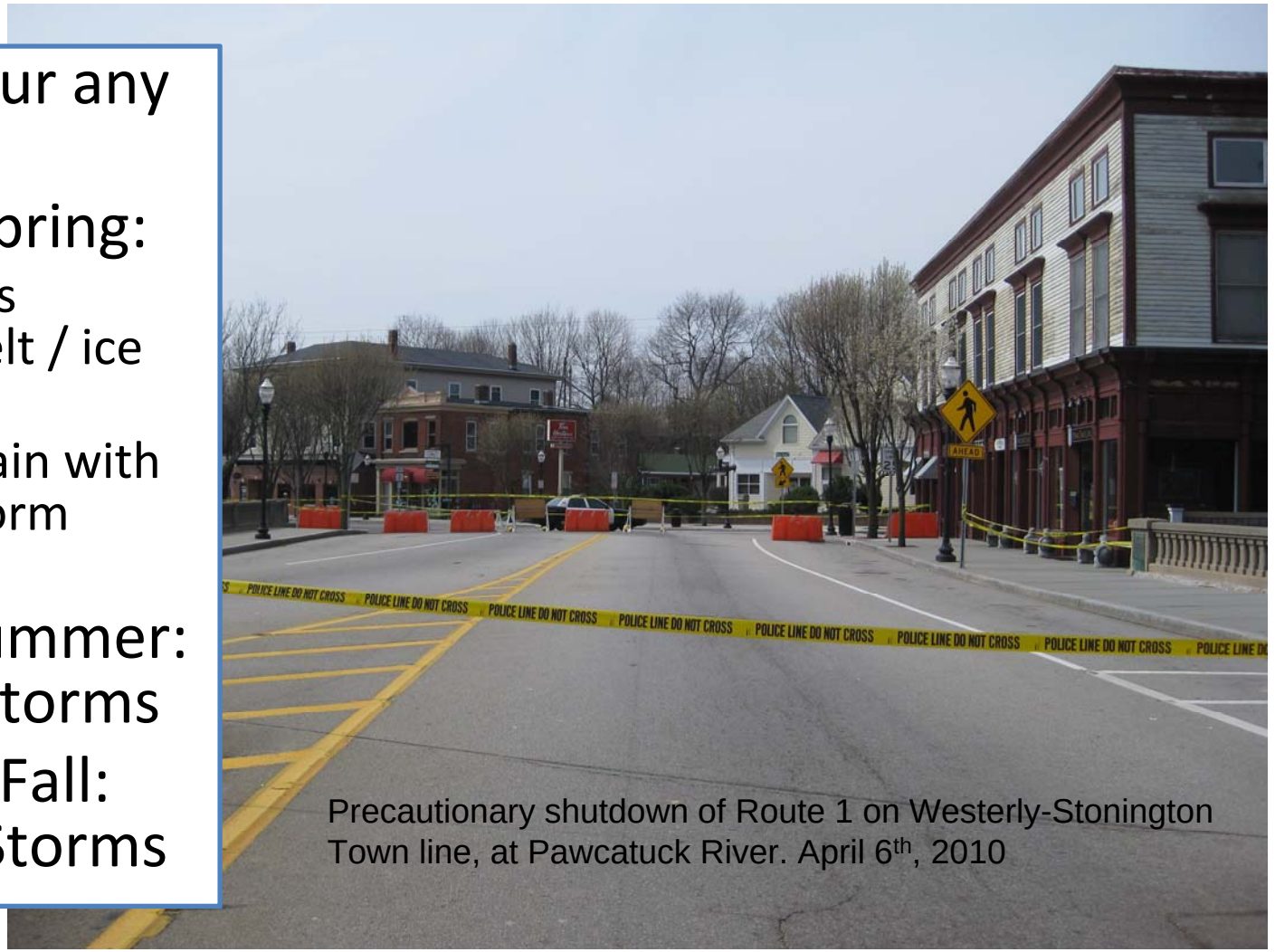
- National Weather Service mission is to provide weather, water and climate data, forecasts and warnings for the protection of life and property and the enhancement of the national economy.

- Federal Government: Department of Commerce
  - National Oceanic and Atmospheric Administration (NOAA)
    - National Weather Service

Common Causes of CT Floods

Floods can occur any time of year:

- Winter/Spring:
  - Rain plus snowmelt / ice jams
  - Heavy rain with large storm systems
- Spring/Summer: Thunderstorms
- Summer/Fall: Tropical Storms



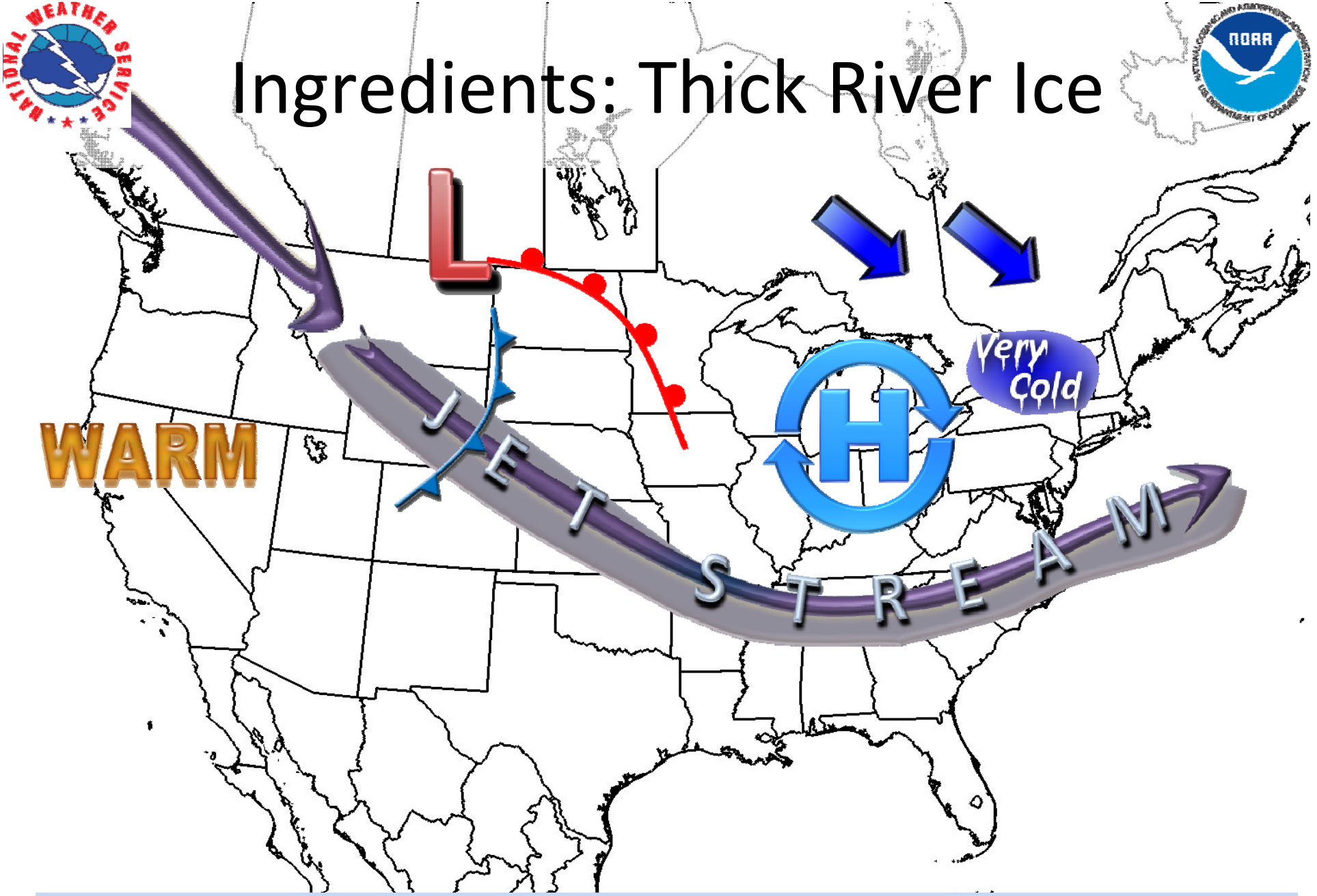
Precautionary shutdown of Route 1 on Westerly-Stonington Town line, at Pawcatuck River. April 6th, 2010

Midwinter/Breakup Ice Jam Ingredients

- Significant river ice thickness
  - Extended period of below freezing temperatures w/limited thawing
- Increase in river flow
  - From rainfall and/or snowmelt
- Jam site
  - Location where ice stops moving and blocks the channel

Slide courtesy USACE CRREL Ice Engineering Group

Ingredients: Thick River Ice



Prevailing Weather Pattern- Dec 26th 2017 thru Jan 10th 2018

Ingredients: Thick River Ice Jan 10th

SMALL STREAM

Coginchaug at Berlin

MEDIUM SIZE RIVER

Farmington River at Farmington

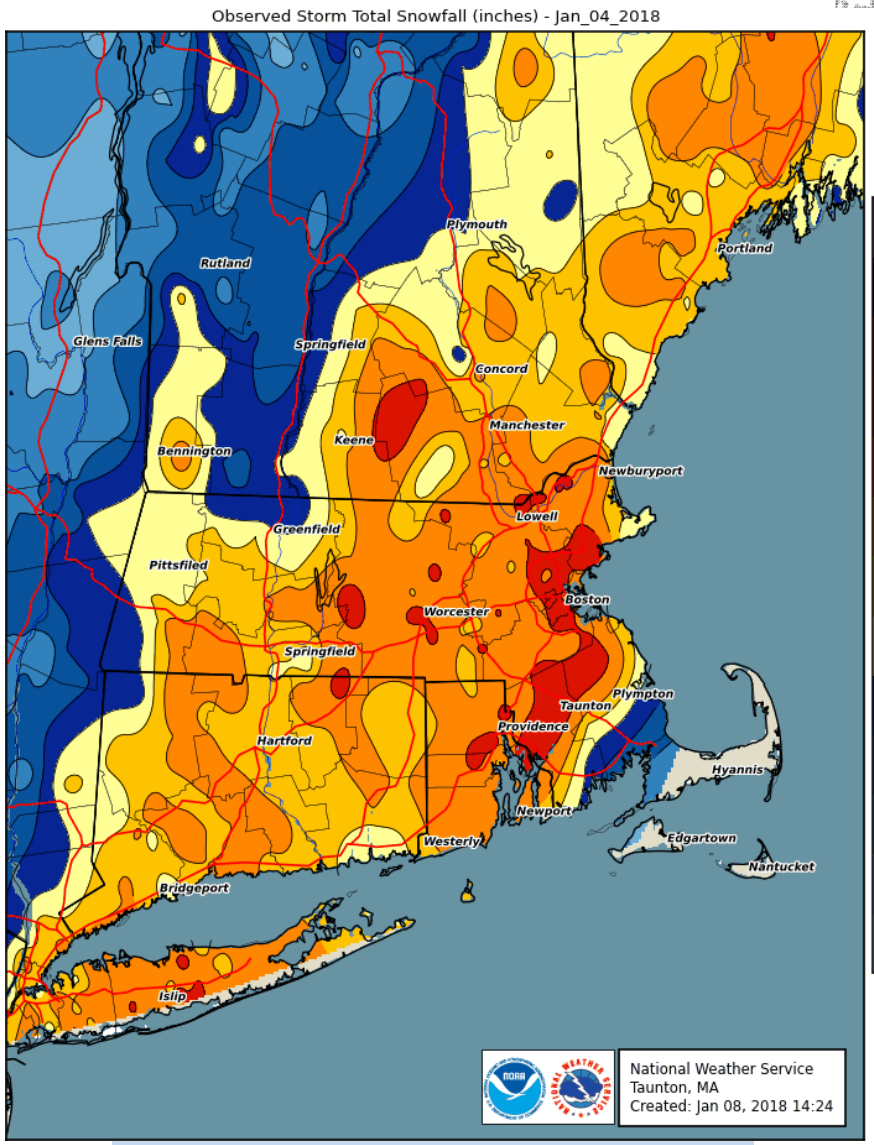
LARGE RIVER

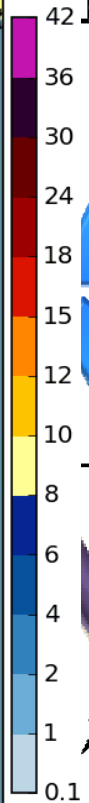
Connecticut River at Middletown

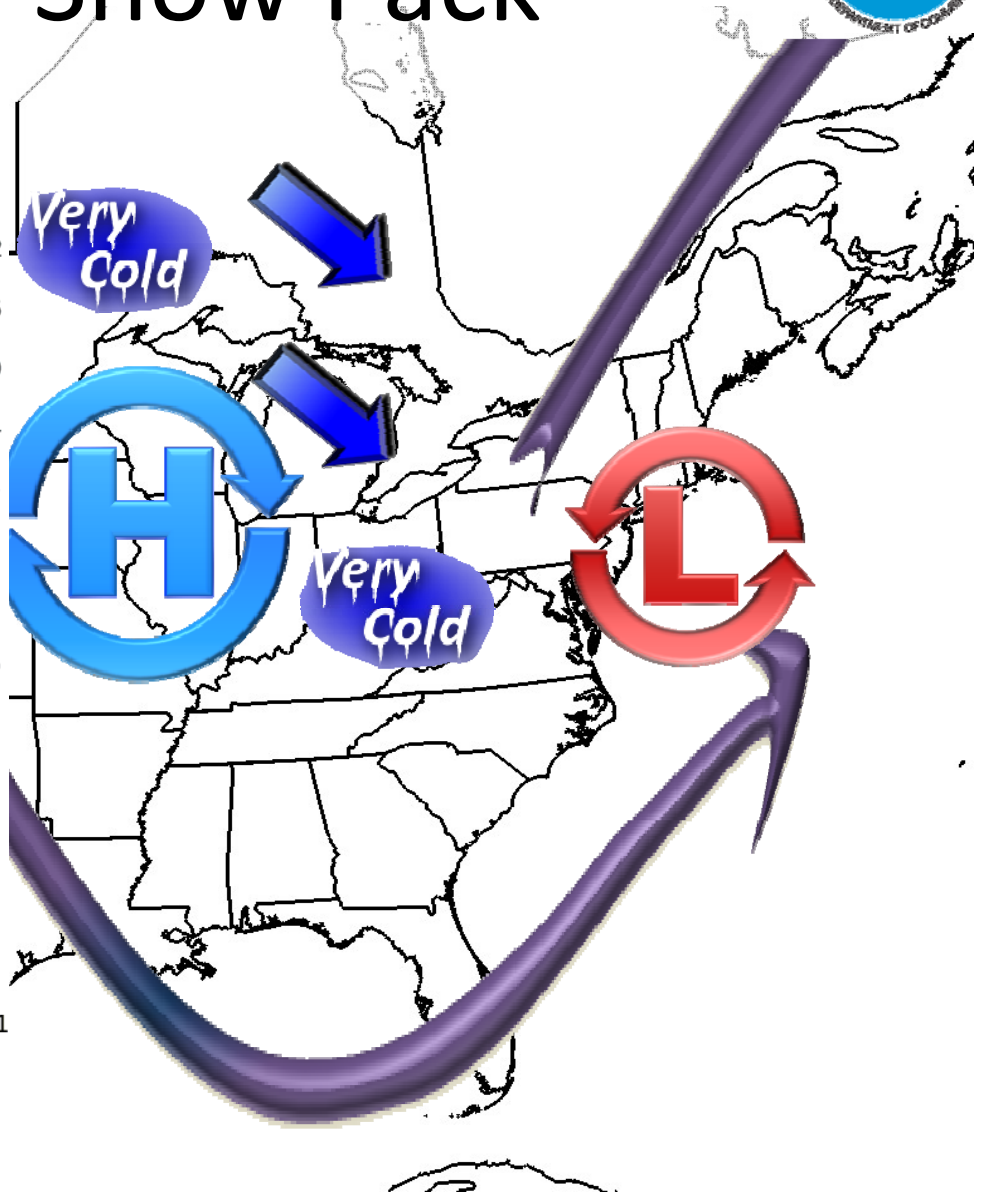
River ice pictures and reports from:
Summary of Connecticut (State) River Ice
January 10, 2018
Douglas Glowacki
Emergency Management Program Specialist
DESPP/DEMHS

- River Ice Thickness as of 1/10/18:
- Average thickness 8”-14” across the State
- Some open water in faster flowing waterways

Building a Snow Pack



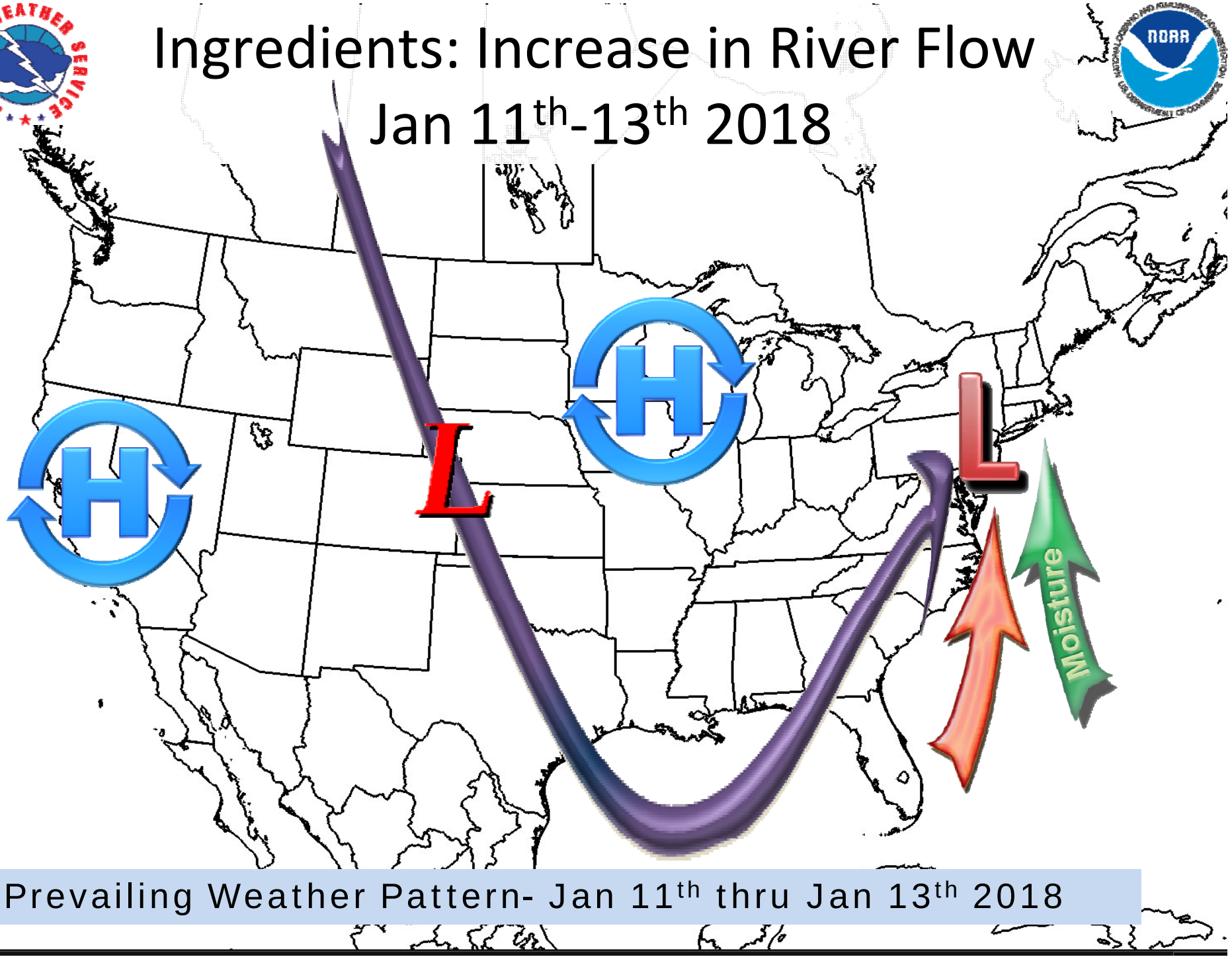




January 4th Snowfall

January 4th Nor'easter/Blizzard

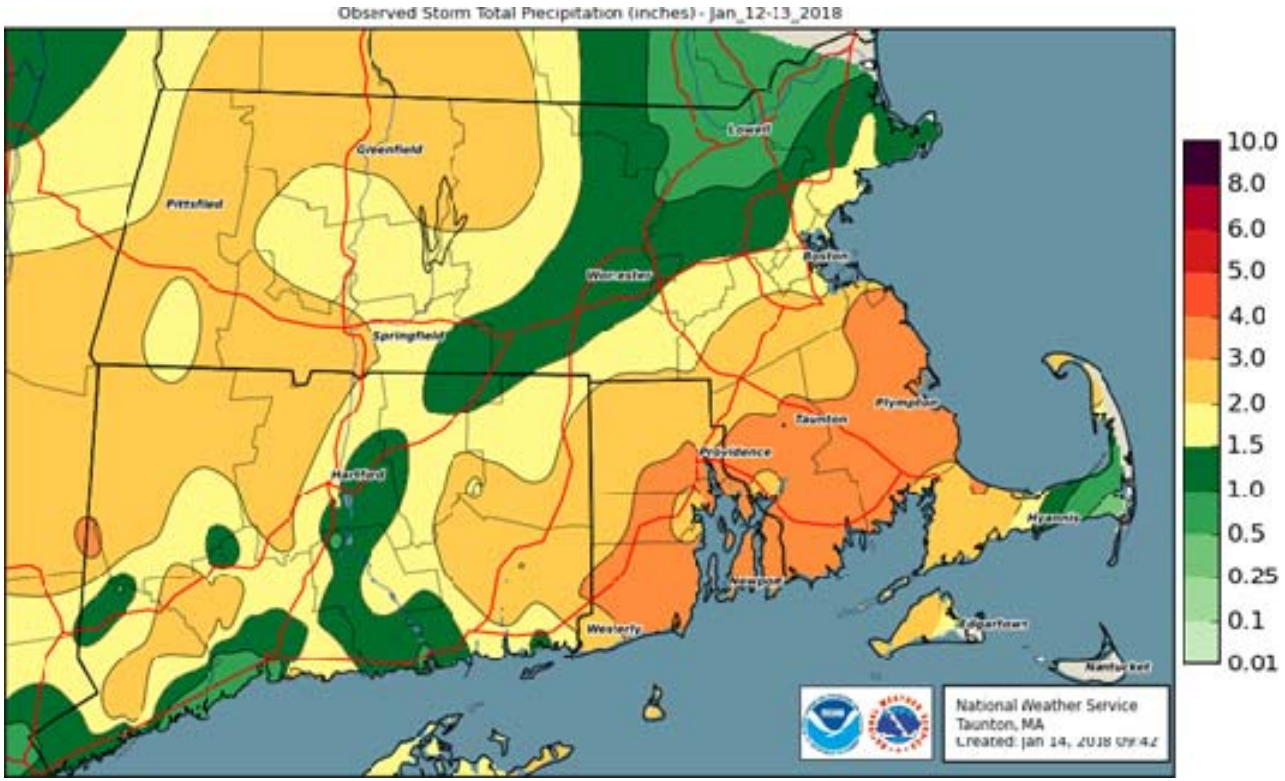
Ingredients: Increase in River Flow
Jan 11th-13th 2018



Prevailing Weather Pattern- Jan 11th thru Jan 13th 2018

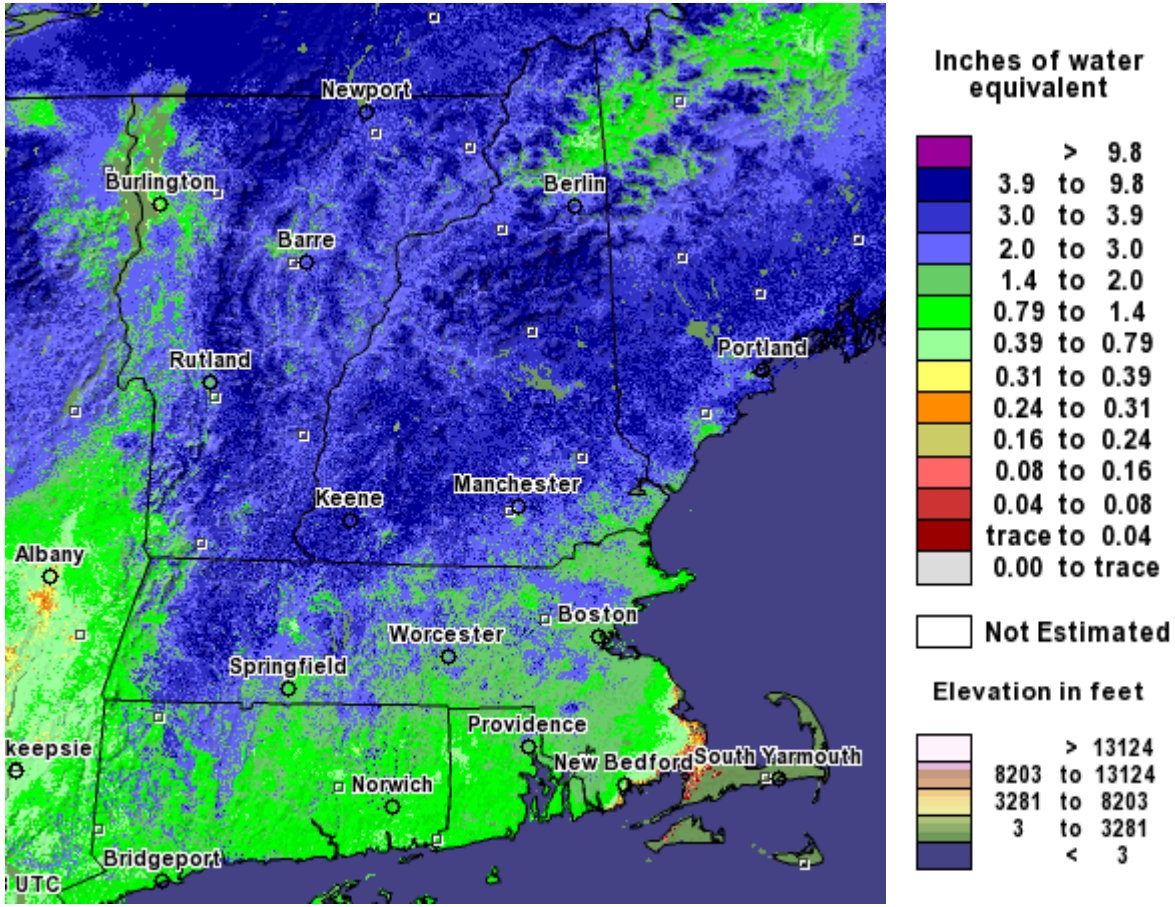
Ingredients: Increased River Flow

Comparable rainfall amounts in the CT River Headwaters of VT/NH



- Rainfall/snowmelt with a thaw will enhance the potential for break up jams as rising water helps to lift and break up the ice.
- Jan 11-13 brought heavy rainfall and a 3-day thaw that melted much of the snowpack in New England

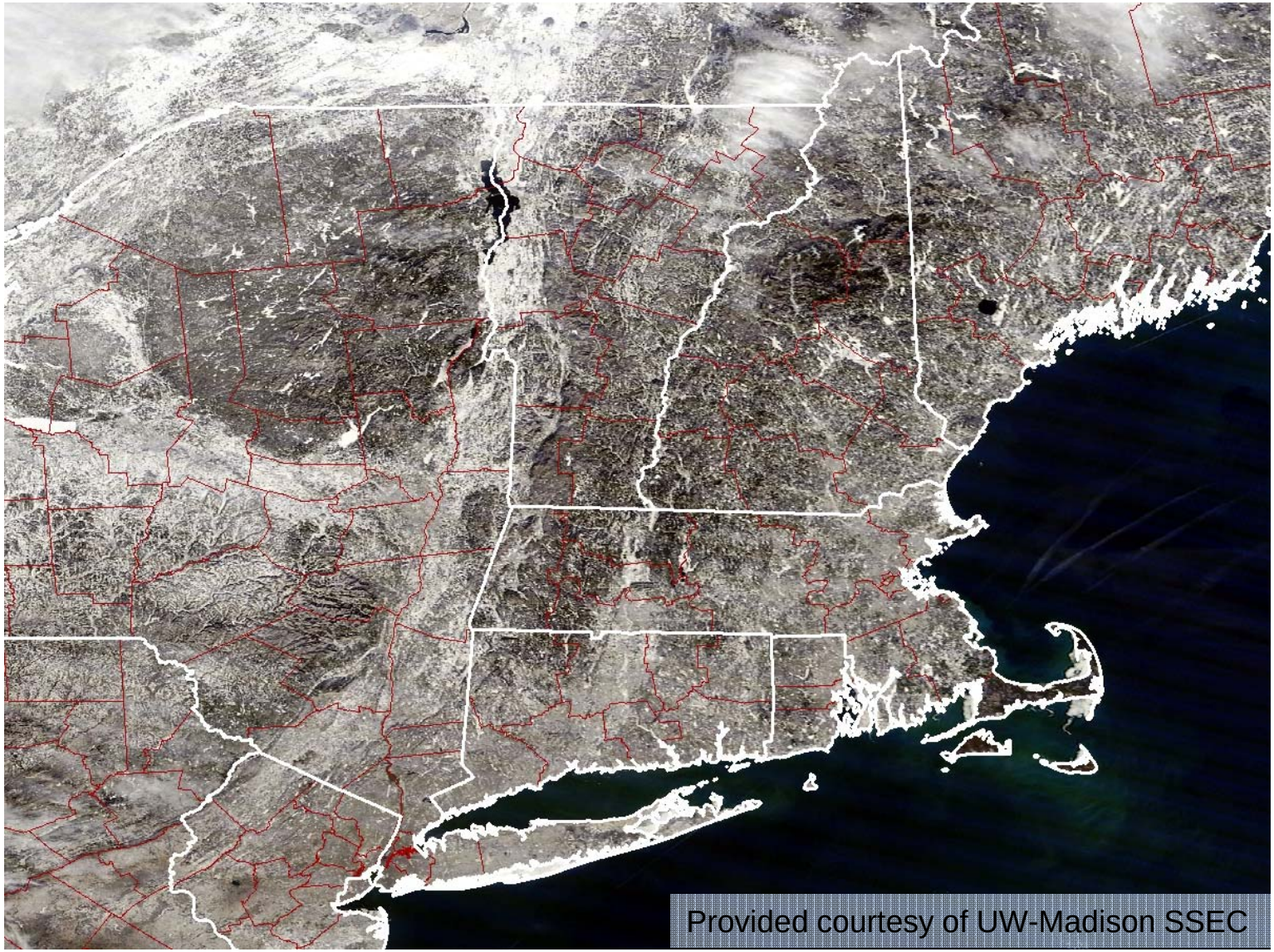
Ingredients: Increased River Flow



Modeled snow melt from Jan 11-13 2018, from the National Hydrologic Remote Sensing Center (NORHSC).

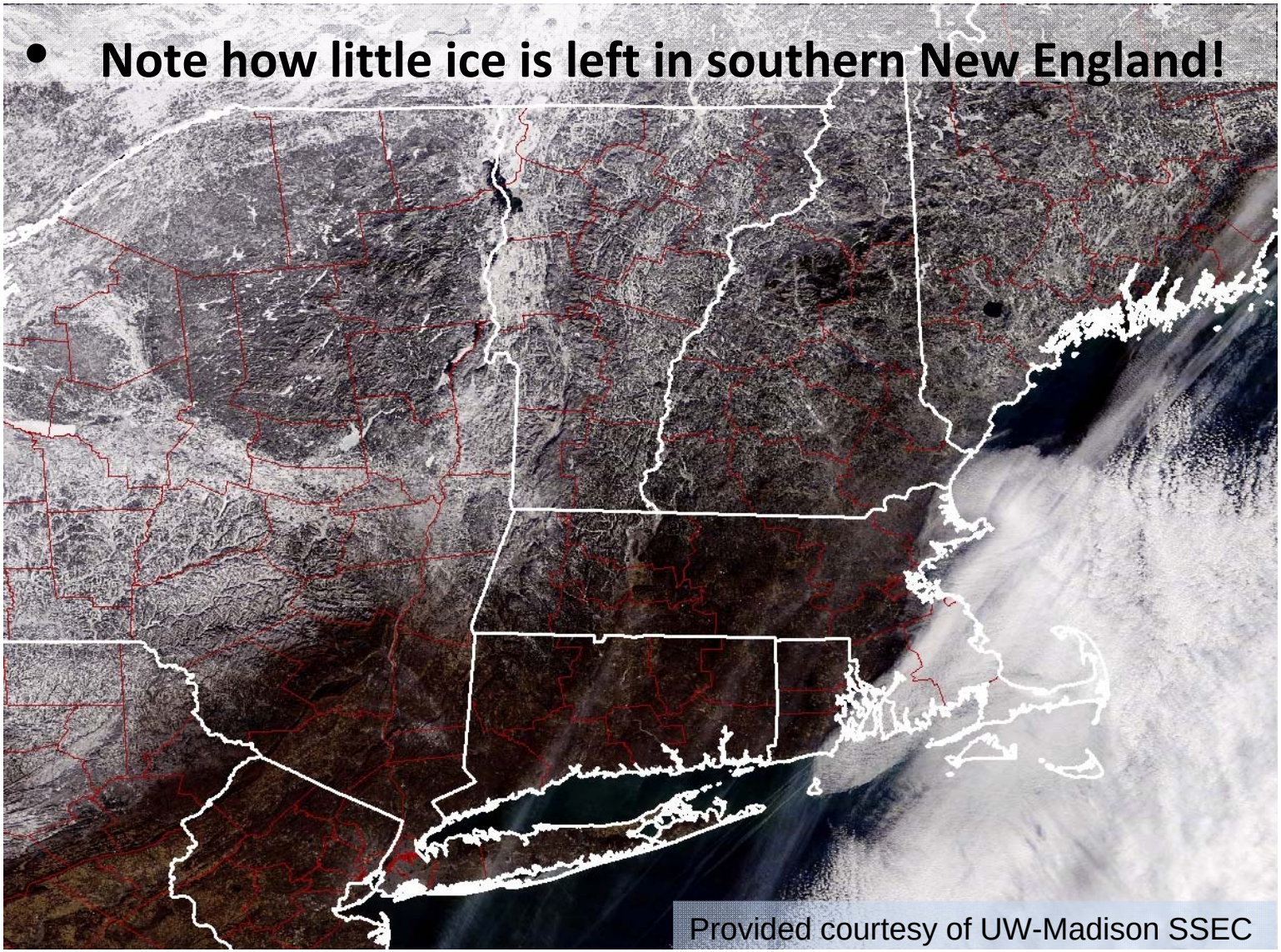
- Jan 11-13 2018 Snowmelt associated with 3 days of warmth
- Record warmth on Jan 12th
- Snowmelt of 1-2+ inches was common across much of New England
- For ice breakup: Generally need a river rise about 3 times the ice thickness to break it up.

MODIS Satellite Imagery: Jan 10th 2018



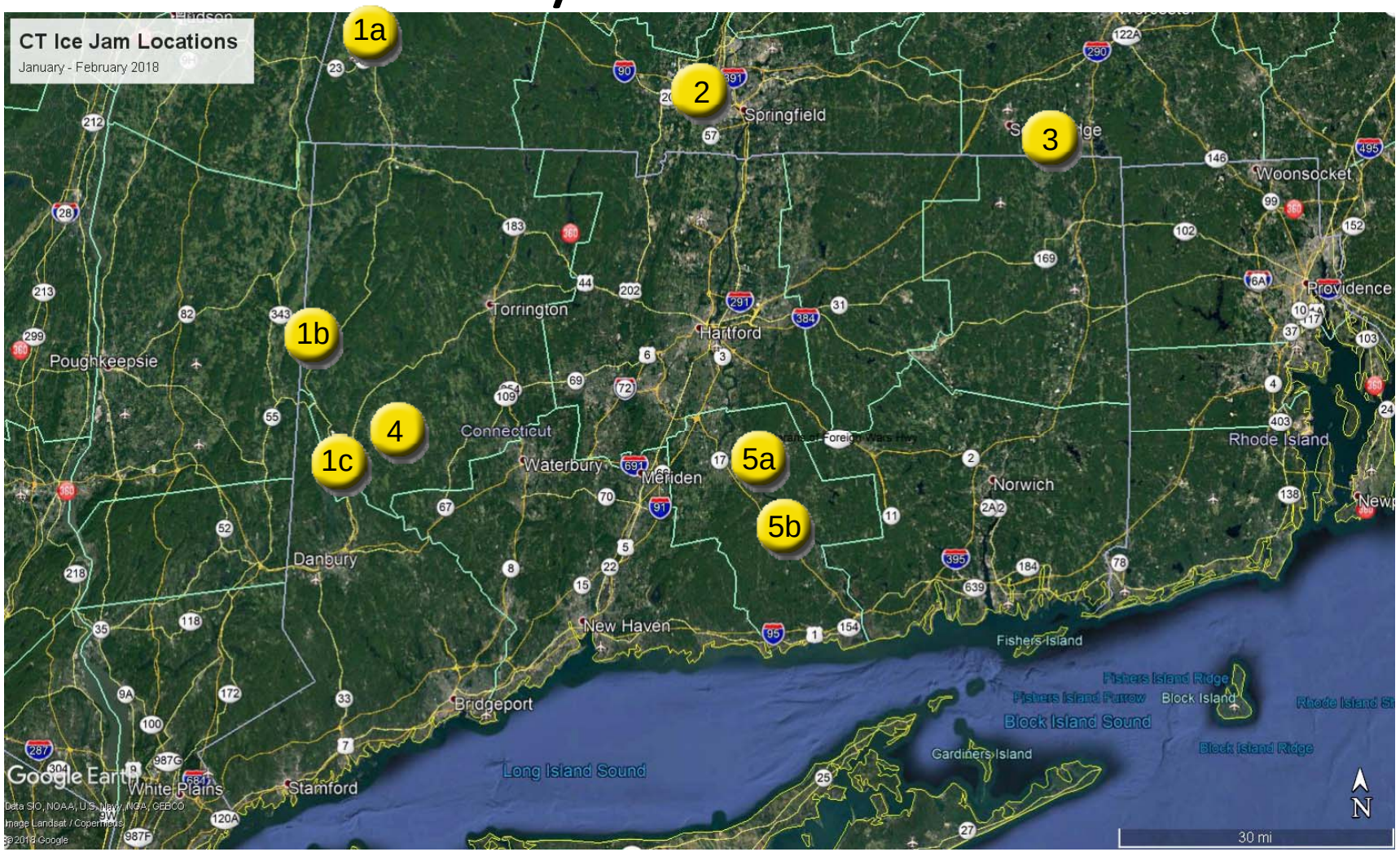
MODIS Satellite Imagery: Jan 14th 2018

- **Note how little ice is left in southern New England!**

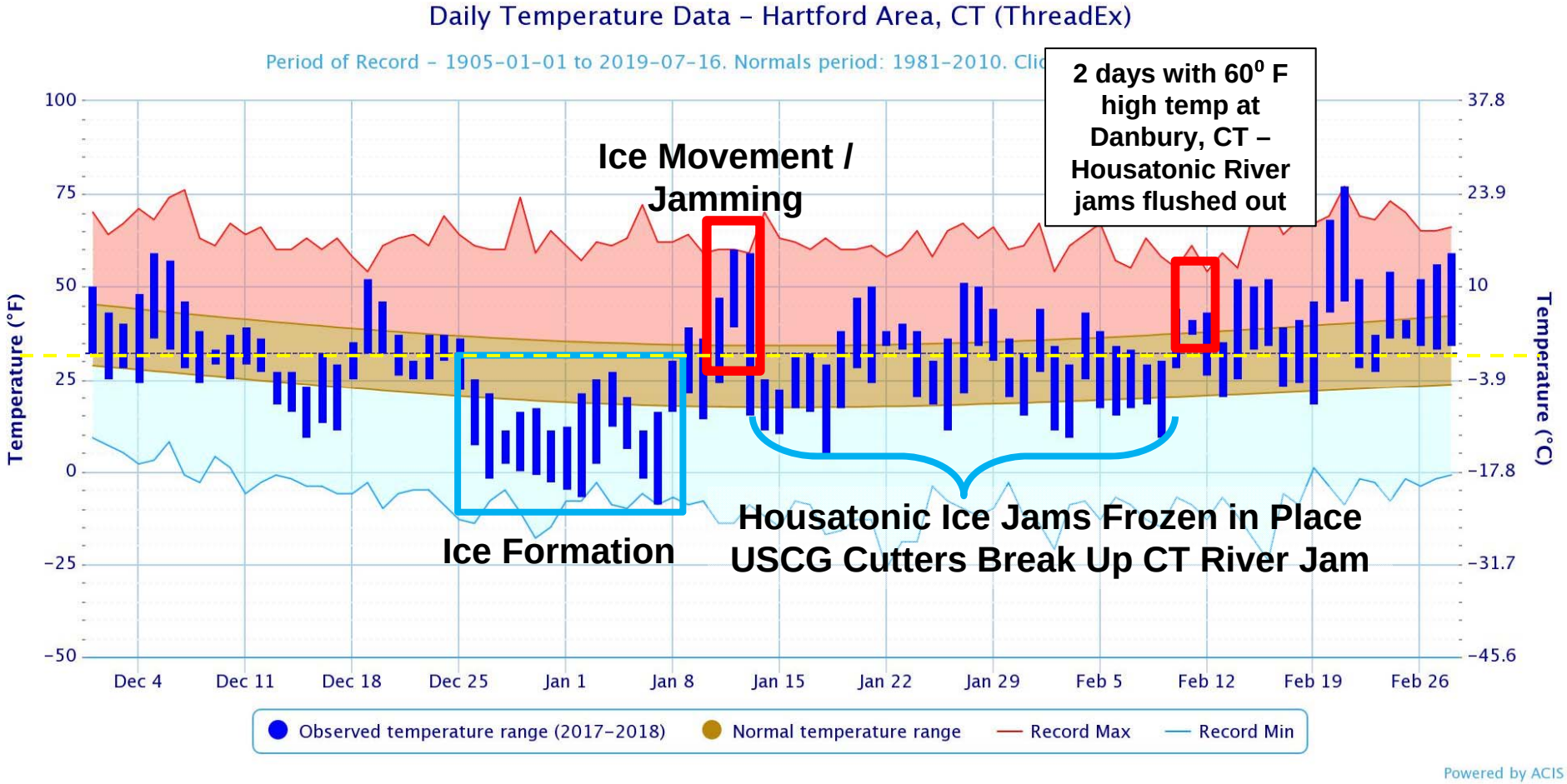


Provided courtesy of UW-Madison SSEC

Ice Jam Locations
Jan/Feb 2018

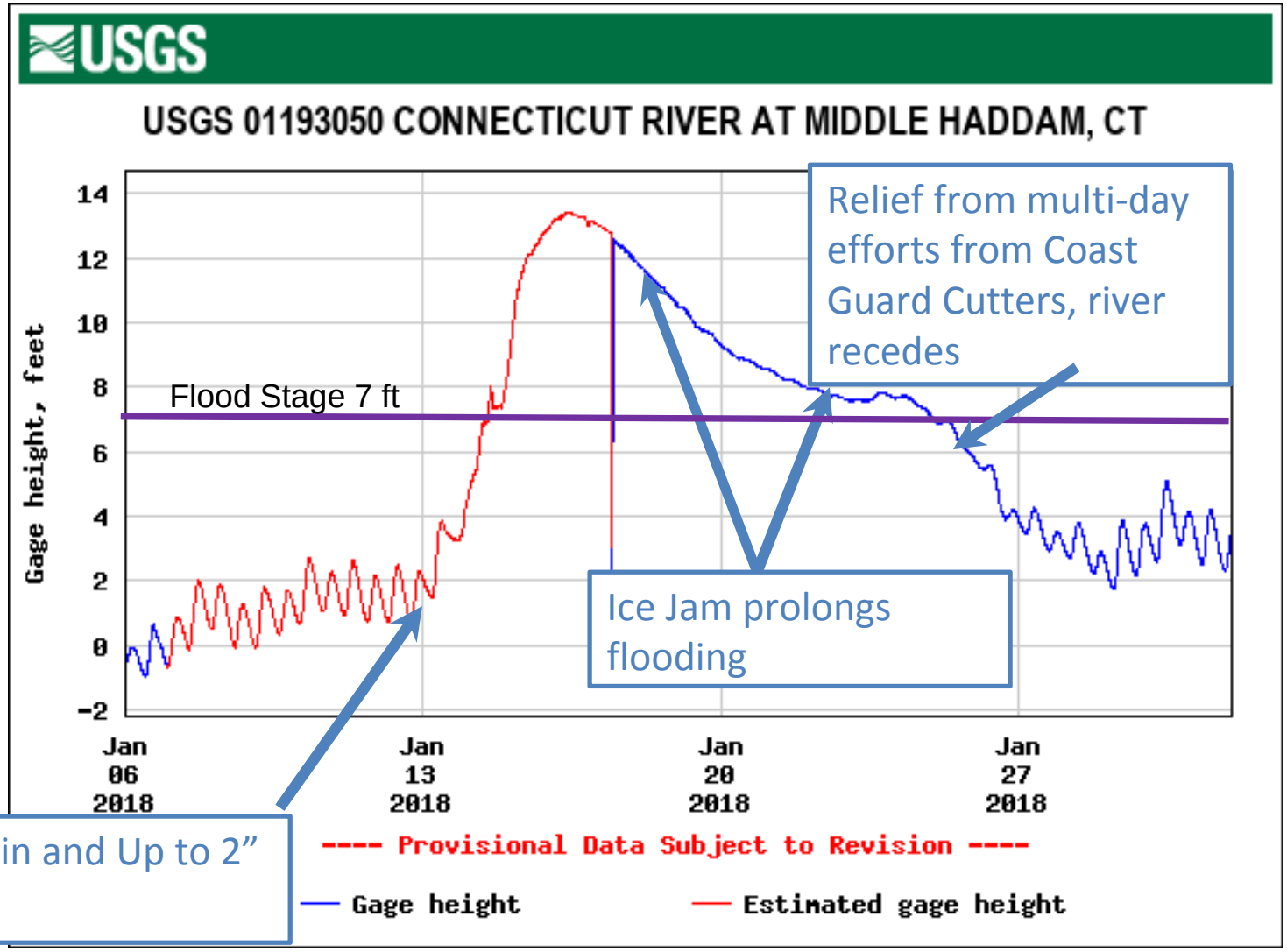


Ingredients: Thick River Ice Increase in River Flow



Hartford 14-day stretch from Dec 26 2017 thru Jan 8 2018:
Average daily temp of +10 F
This was 17 deg F below normal.

Ice Jam on Connecticut River



East Haddam Swing Bridge

Downstream view, Jan 18th 2018

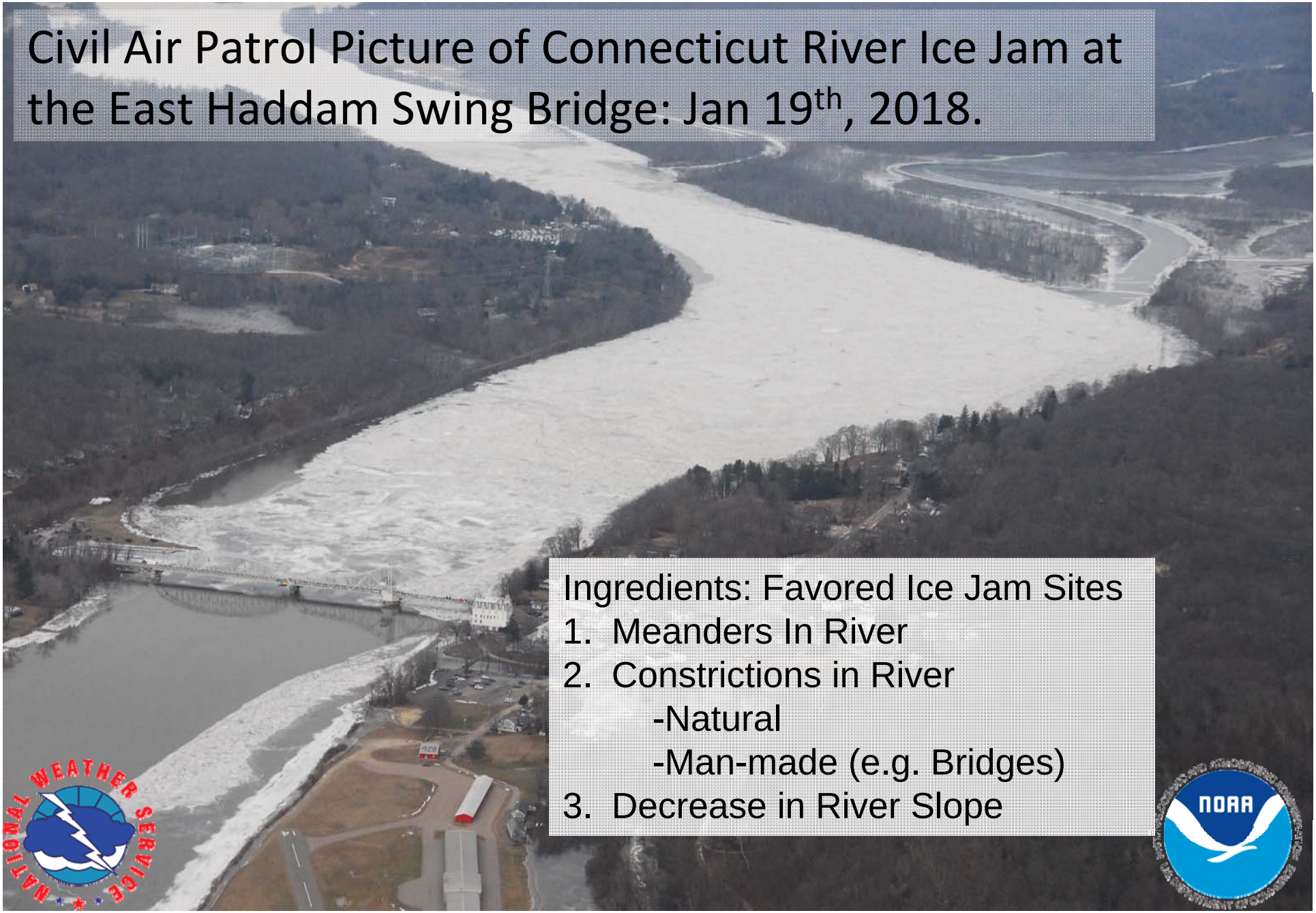
Upstream view, Jan 18th 2018

East Haddam, Harper's Landing

Upstream view, Jan 18th 2018

Close-up on ice, Jan 18th 2018

Civil Air Patrol Picture of Connecticut River Ice Jam at the East Haddam Swing Bridge: Jan 19th, 2018.



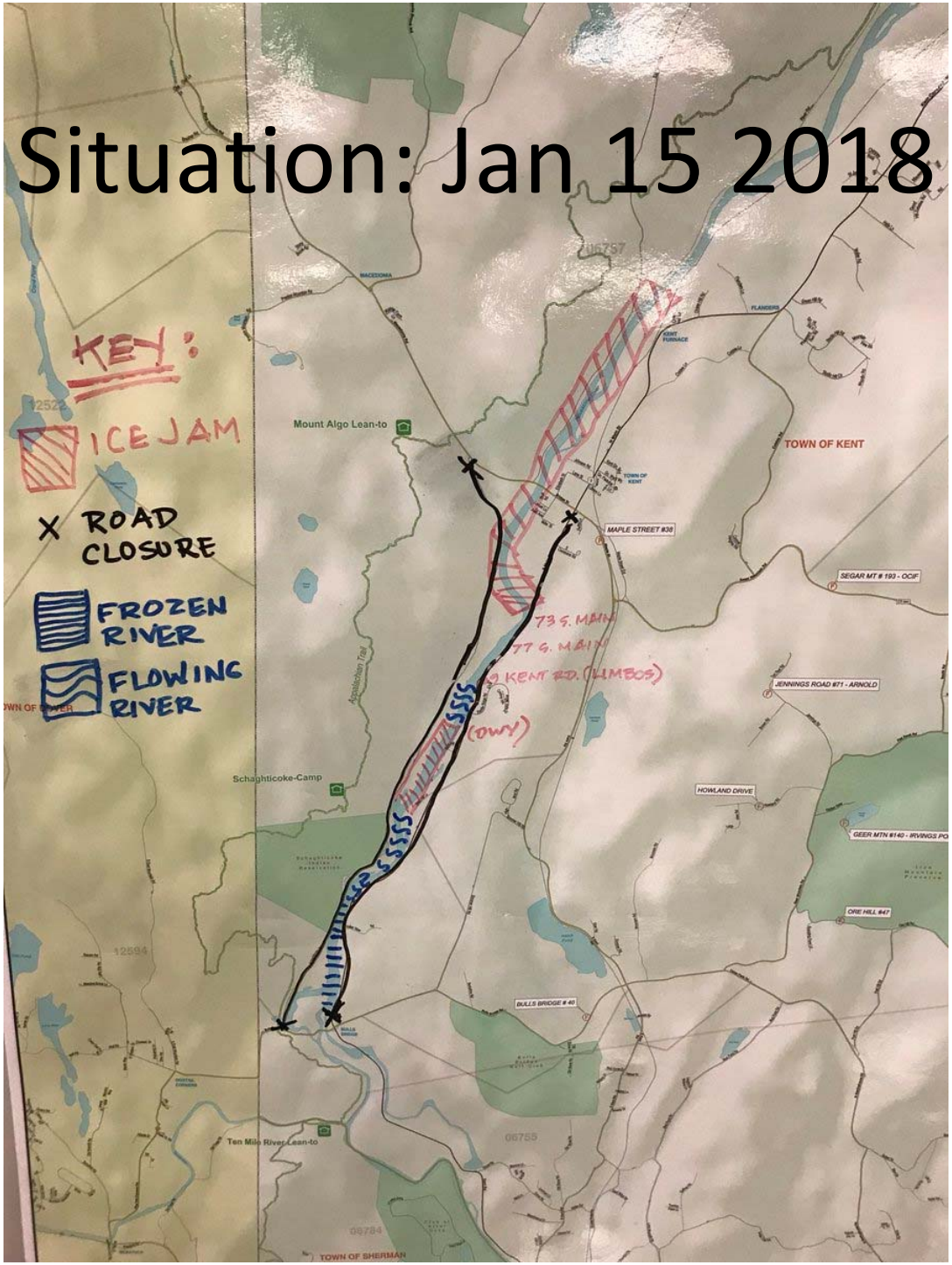
Ingredients: Favored Ice Jam Sites

1. Meanders In River
2. Constrictions in River
   - -Natural
   - -Man-made (e.g. Bridges)
3. Decrease in River Slope

Ingredients: Jam Site

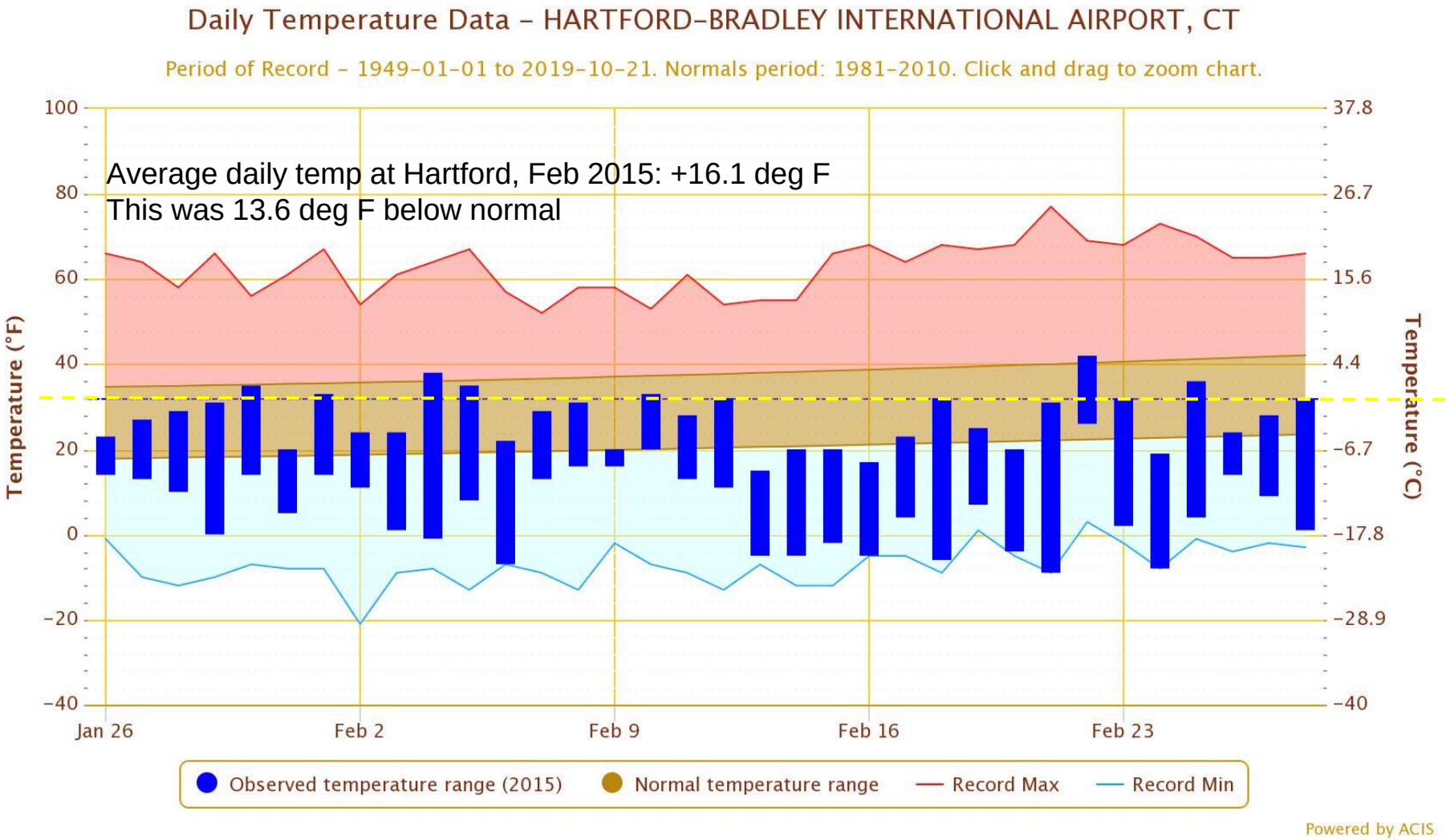
Jan 27, 2018
Civil Air Patrol
Flight

Situation: Jan 15 2018



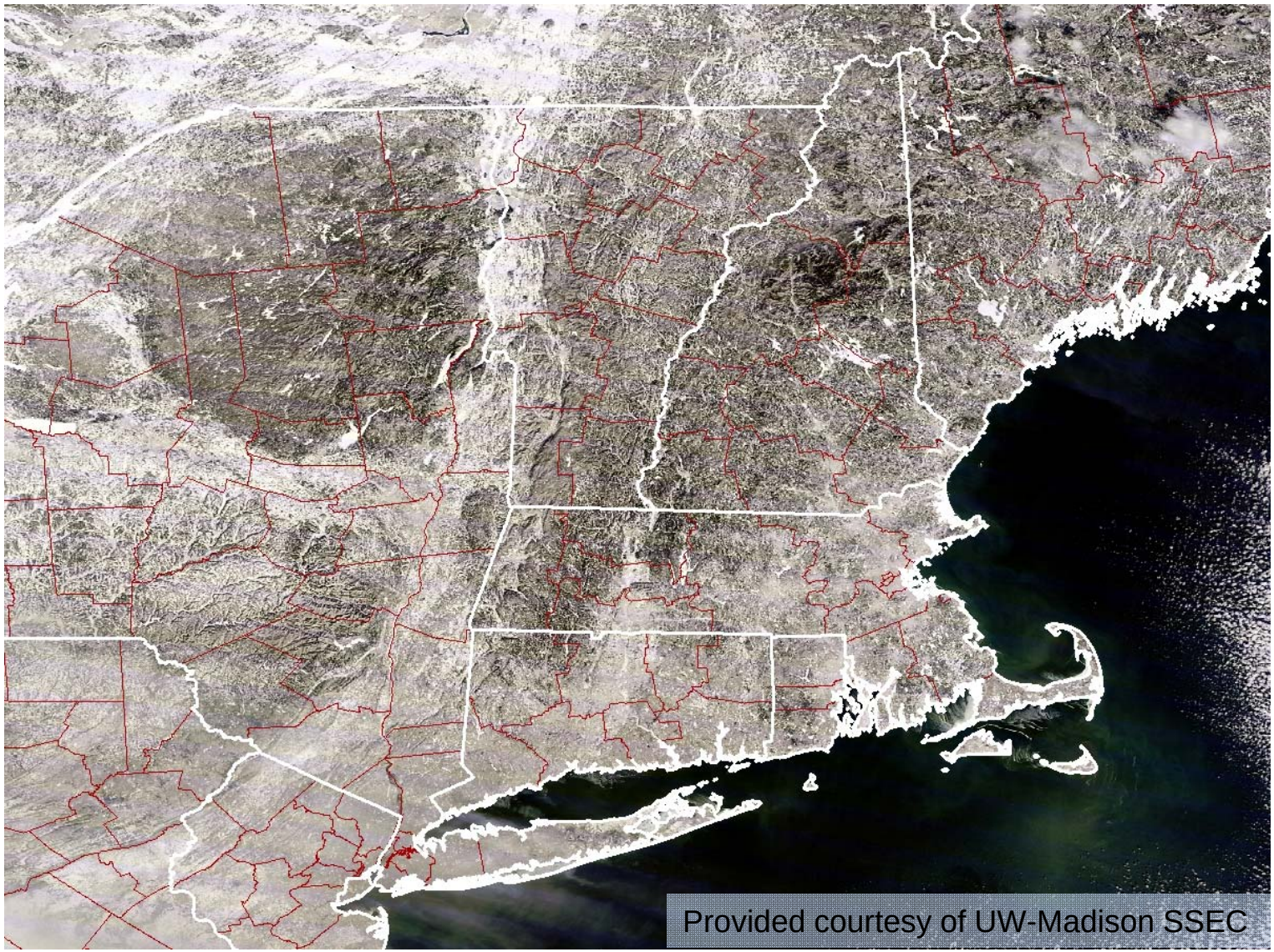
Jan 27, 2018 CAP flight

In Comparison…Feb 2015



NRCC: The State of CT had its 2nd coldest February on record.

MODIS Satellite Imagery: Feb 16th 2015:

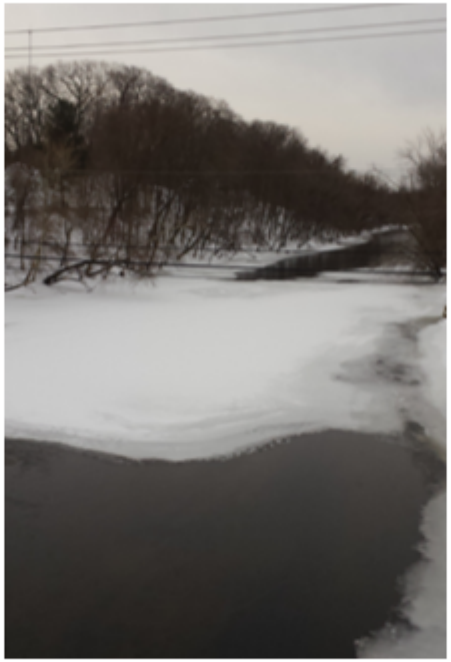


Ingredients: Thick River Ice

SMALL RIVERS

Coginchaug River at Berlin

MEDIUM RIVERS



Farmington River at Farmington

LARGE RIVERS

Connecticut River at Middletown

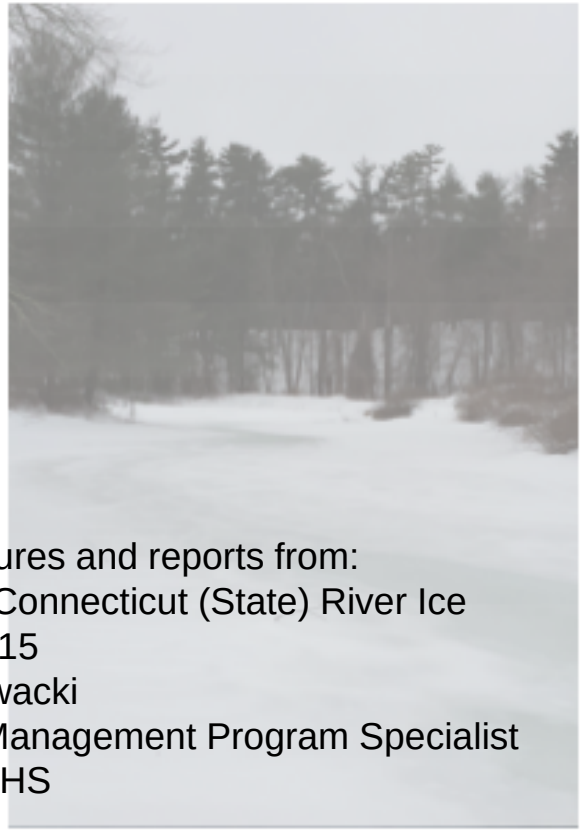
River ice pictures and reports from:
Summary of Connecticut (State) River Ice
February 26, 2015
Douglas Glowacki
Emergency Management Program Specialist
DESPP/DEMHS

- River Ice Thickness as of 2/26/15:
- Well exposed rivers: <6” ice, 50% coverage
- Shaded/low flow: 12-16” ice,~100% coverage

Fate of the River Ice: No CT Ice Jams

- Ice decay and rot: Gradual, over full month of March 2015

3/5/15



3/12/15

Tributary to the Farmington River in Farmington, Connecticut

River ice pictures and reports from:
Summary of Connecticut (State) River Ice
March 12, 2015
Douglas Glowacki
Emergency Management Program Specialist
DESPP/DEMHS

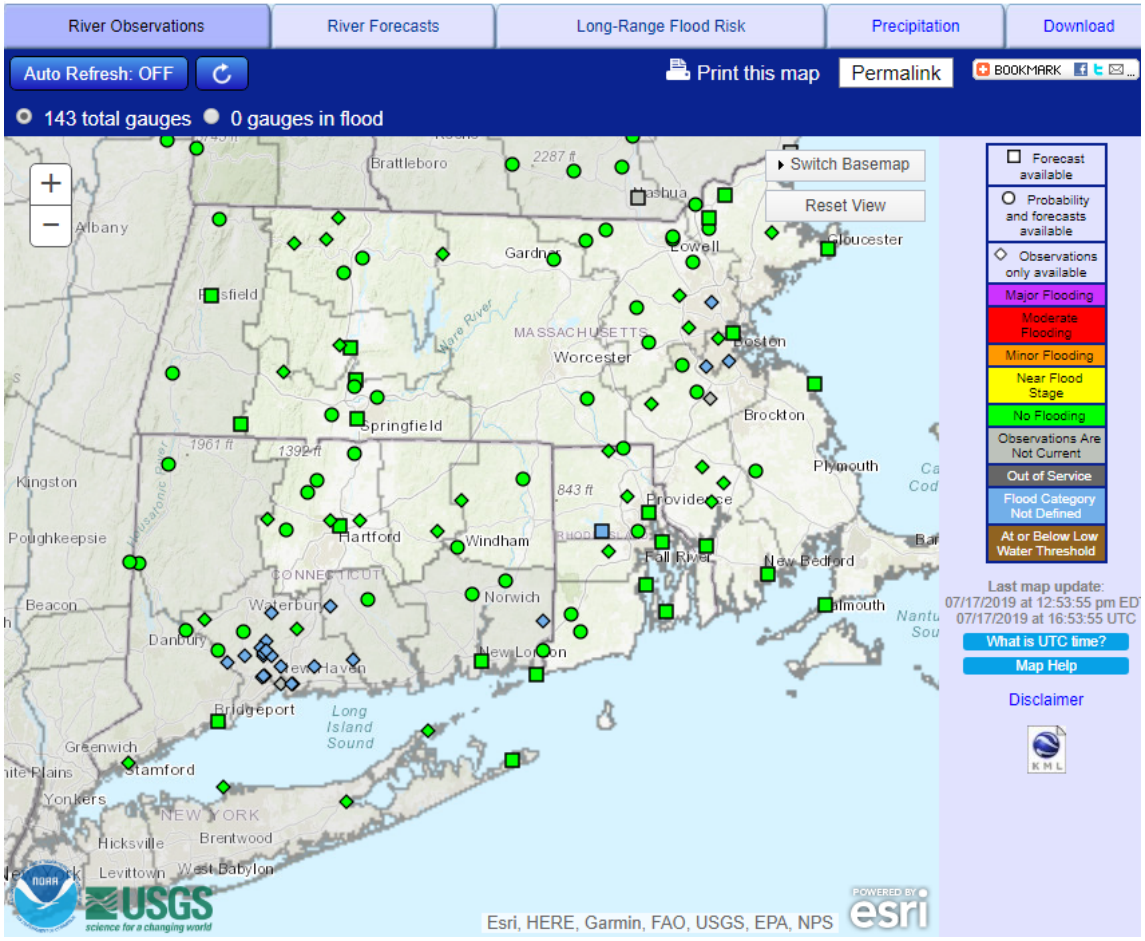
Forecasting Ice Jams

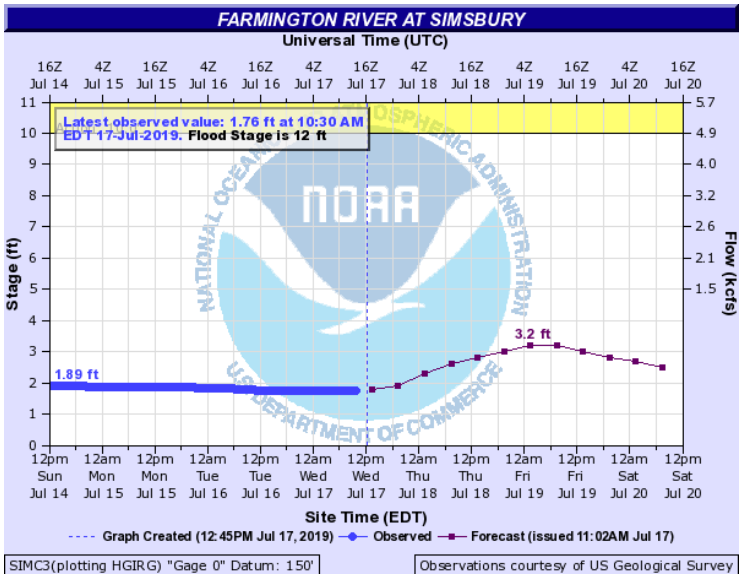
- When conditions favor ice breakup and/or river rise NWS will highlight the risk using these public products:
  - Hazardous Weather Outlook
  - Flood Watch (if confidence high)
  - Flood Warning or Flash Flood Warning
- In addition to our public products, we also provide Decision Support Services to Emergency Management, including:
  - Conference calls
  - Email briefings
  - One-on-one phone briefings

Getting the Message Out

- NOAA Weather Radio
- Emergency Alert System → Cell phone alerts
- Website: www.weather.gov
- Subscribe to: www.ctalert.gov
- Local officials: iNWS/NWS Chat
- Social media: Follow Us On twitter Find us on Facebook
- Twitter: @NWSAlbany @NWSBoston
  @NWSNewYorkNY

Advanced Hydrologic Prediction Service (AHPS)





Real-time river observations and forecasts at water.weather.gov

Flood Categories (in feet)

Major Flood Stage:	18
Moderate Flood Stage:	15
Flood Stage:	12
Action Stage:	10

Historic Crests
(1) 30.10 ft on 08/20/1955
(2) 22.10 ft on 10/17/1955
(3) 18.20 ft on 01/02/1949
(4) 17.80 ft on 11/05/1927
(5) 16.98 ft on 08/29/2011
Show More Historic Crests

(P): Preliminary values subject to further review.

Recent Crests
(1) 13.81 ft on 06/15/2013
(2) 14.23 ft on 09/09/2011
(3) 16.98 ft on 08/29/2011
(4) 13.71 ft on 03/12/2011
(5) 15.50 ft on 03/08/2011
Show More Recent Crests

(P): Preliminary values subject to further review.

Low Water Records
(1) 0.50 ft on 08/01/1995

FEMA

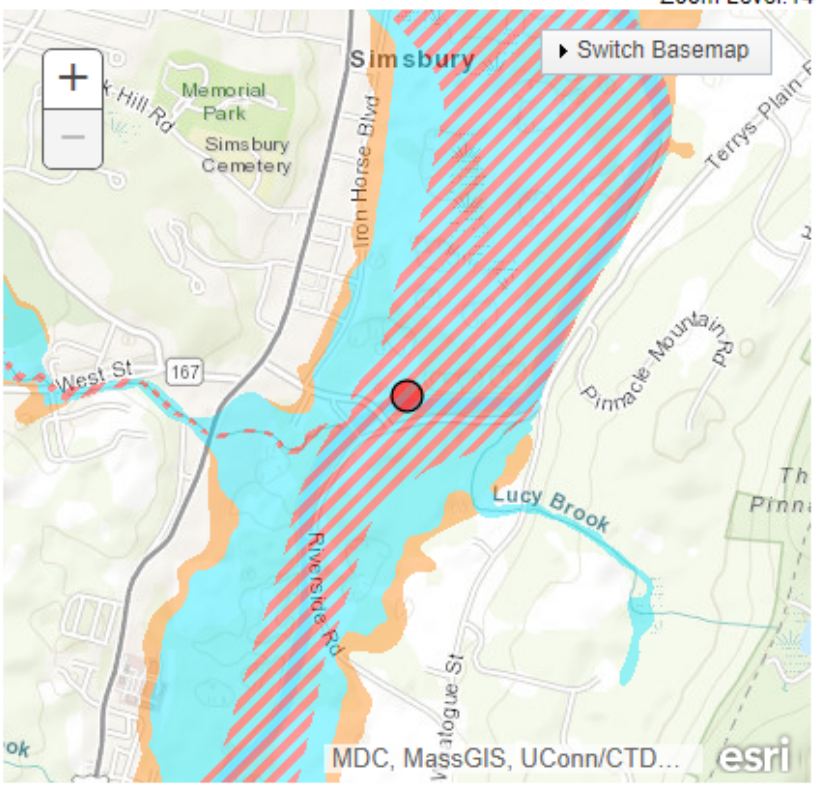
For more information on your flood risk go to www.floodsmart.gov.

Show FEMA's National Flood Hazard Layers

FEMA's National Flood Hazard Layers not showing?

Note: Your zoom level may have changed. ESRI's zoom levels must be between 14 and 16 to show National Flood Hazard layers.

Zoom Level:14



Legend

- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Special Floodway
- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee

FEMA Layer

KML

Gauge Location

Disclaimer

Latitude/Longitude Disclaimer: The gauge location shown in the above map is the approximate location based on the latitude/longitude coordinates provided to the NWS by the gauge owner.

Impact Statements

Flood Impacts & Photos

Collapse

If you notice any errors in the below information, please contact our Webmaster

30 Widespread catastrophic flooding occurs throughout the Valley. Follow the advice of local officials, and evacuate if asked to do so.

22 Widespread flooding will affect portions of Farmington, Avon, Simsbury, Bloomfield and East Granby. Follow the advice of local officials, and evacuate if asked to do so.

18 This is a serious flood event and will affect numerous areas along the river. Act now to protect life and property. Follow the directions of your local emergency management officials. If you are asked to evacuate do so immediately.

16 Moderate flooding occurs with numerous roads and residences affected. Evacuations may be needed along various roads in Avon and Simsbury, including Riverside Road in Simsbury. Flooding also begins to affect low lying sections of Bloomfield and East Granby. Follow the directions of emergency management officials and obey all road closures.

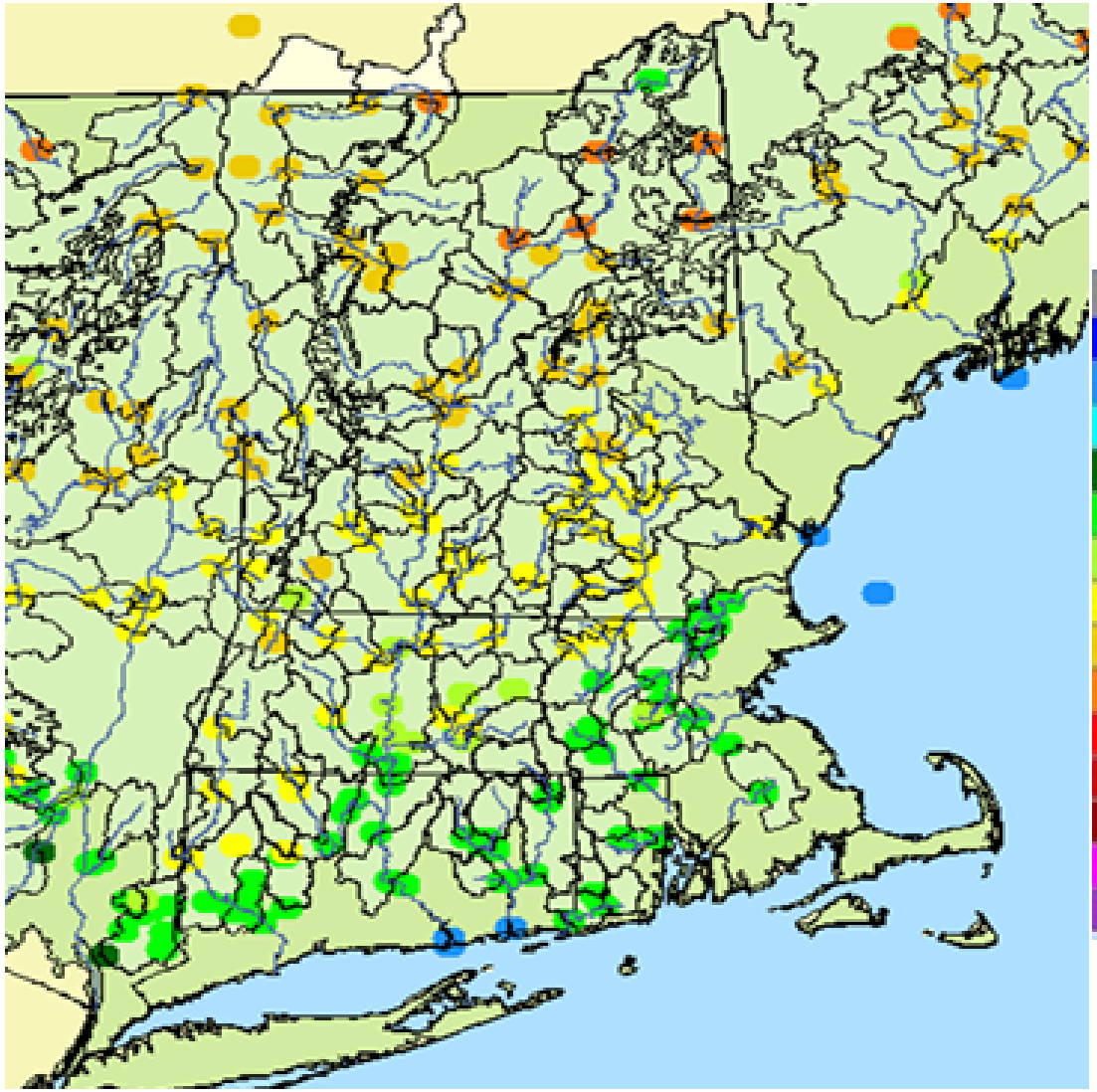
15 Moderate flooding begins with numerous roads and residences affected. Evacuations may be needed along various roads in Avon and Simsbury, including Riverside Road in Simsbury. Flooding also begins to affect low lying sections of Bloomfield and East Granby. Follow the directions of emergency management officials and obey all road closures.

13 Flooding affects Old Farms and Tolliston Roads in Avon, Meadow Road in Farmington, and Nod, Riverside, and Terrys Plain Roads in Simsbury. Route 315 in Simsbury is also impacted. Flooding spreads into Plantation Country Club and adjoining Town Farm Road in Simsbury. Also, flooding will approach the Paine Boathouse.

12 Flooding begins on Riverside Road in Simsbury. Flooding also begins along Old Bridge and Drake Hill Roads.

Resources: NWS NERFC

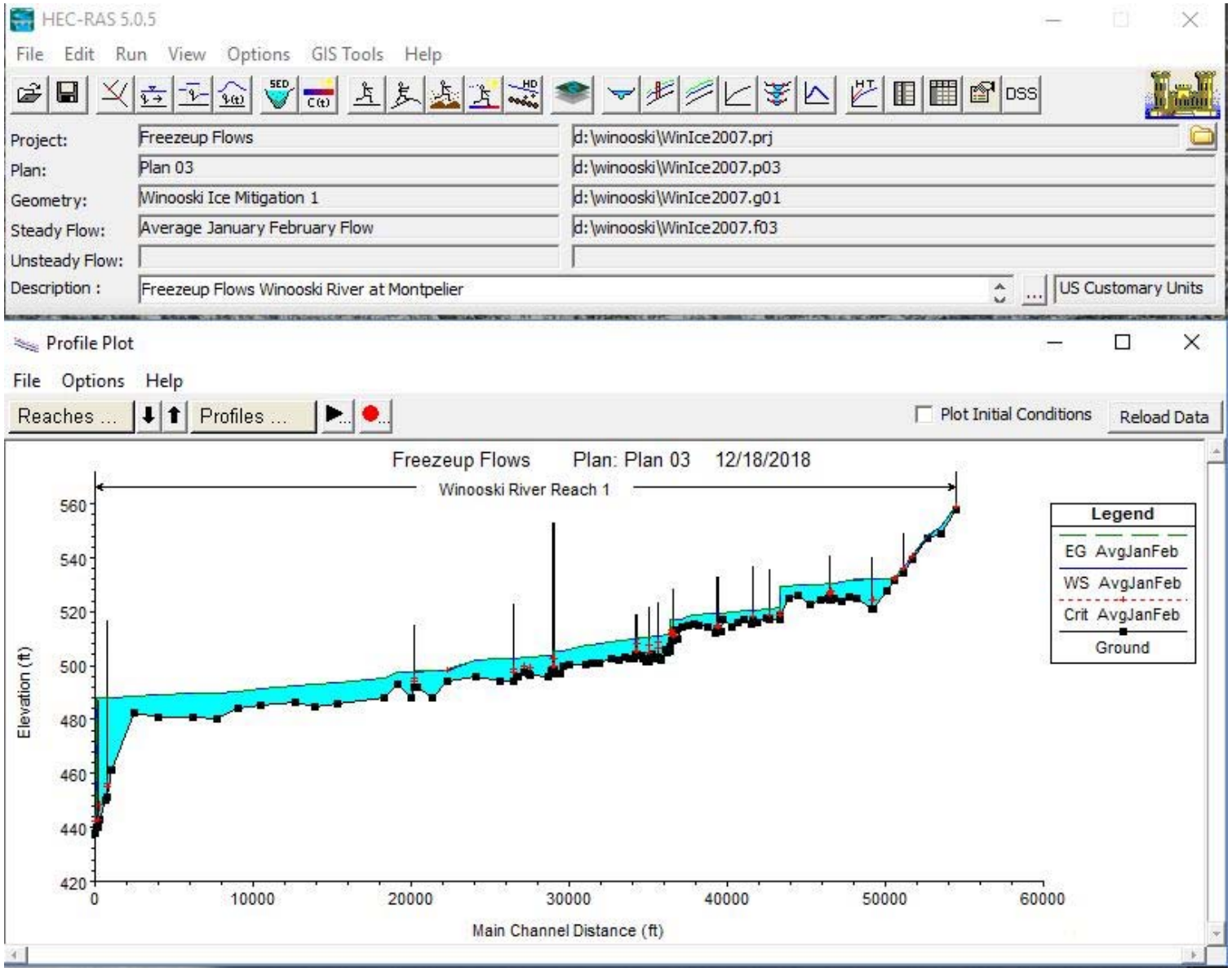
http://weather.gov/nerfc/snow



Modeled ice thickness
Inches

Zero
0 to 1
1 to 3
3 to 6
6 to 9
9 to 12
12 to 15
15 to 18
18 to 21
21 to 24
24 to 27
27 to 30
30 to 33
33 to 36
> 36 inches

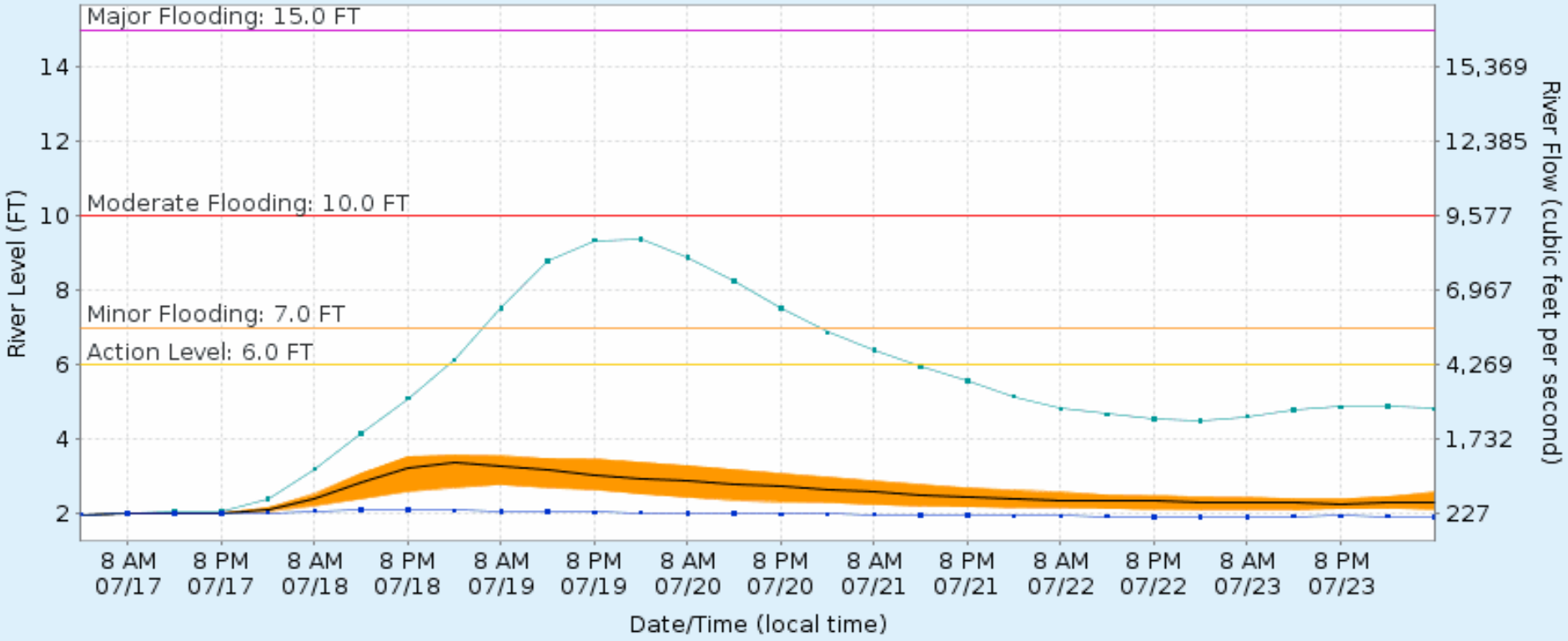
Modeling Ice Jam Backwater



7 Day NAEFS Potential River Levels

Used to Estimate the Chance of Flooding and the Range of Possible River Levels

Housatonic River at Falls Village, CT (FLVC3)



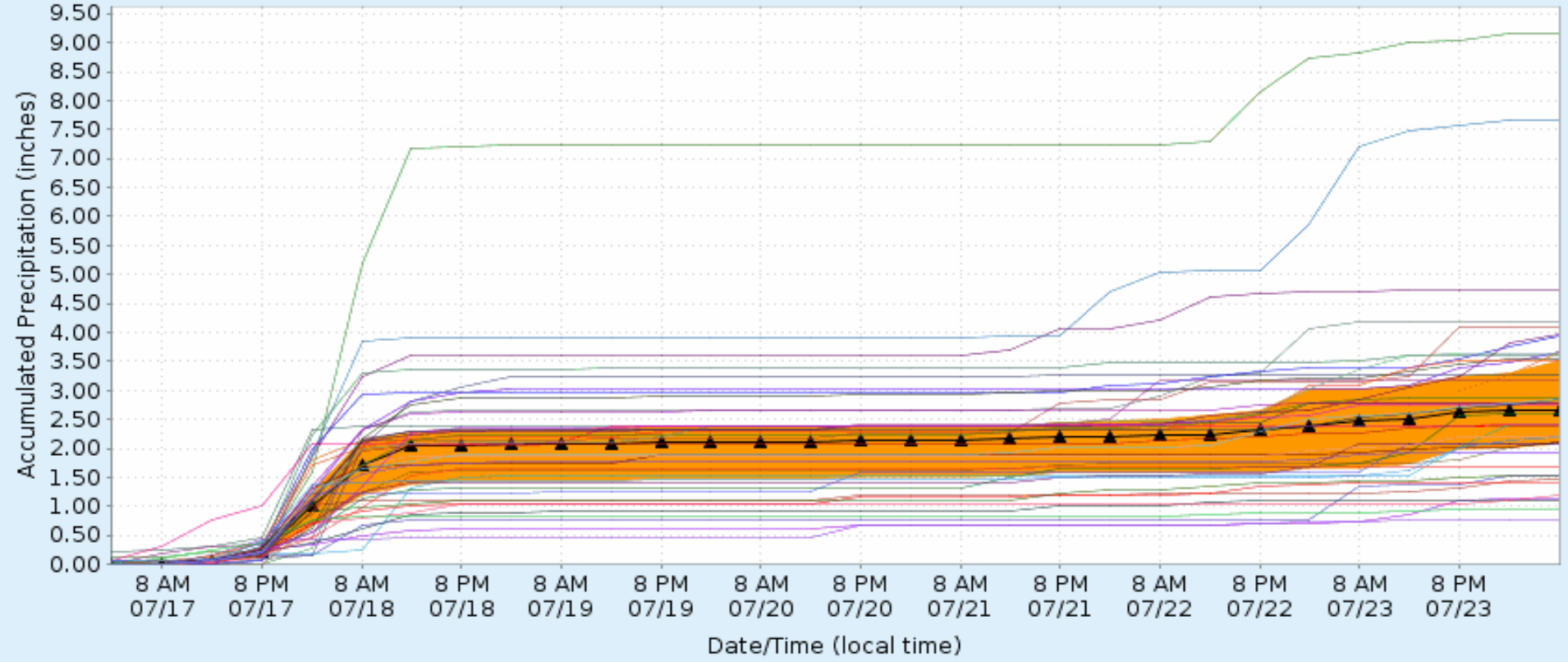
- Minimum River Level (Simulations indicate a 5% Chance of Falling Below this Level)
- Median River Level (Simulations indicate a 50% Chance of Exceeding this Level)
- Maximum River Level (Simulations indicate a 5% Chance of Exceeding this Level)
- More Likely Range (Simulations indicate a 40% chance river levels will fall within this range)

07/17/2019 00 UTC NAEFS Model

7 Day NAEFS Accumulated Precipitation Simulations

Used as Input to the River Level Simulations

Housatonic River at Falls Village, CT (FLVC3)



Individual Model Simulations (42 Total)

Median Precipitation (Simulations indicate a 50% Chance of Exceeding this Rainfall Amount)

More Likely Range (Simulations indicate a 40% chance precipitation amounts will fall within this range)

07/17/2019 00 UTC NAEFS Model

Stay in touch!