

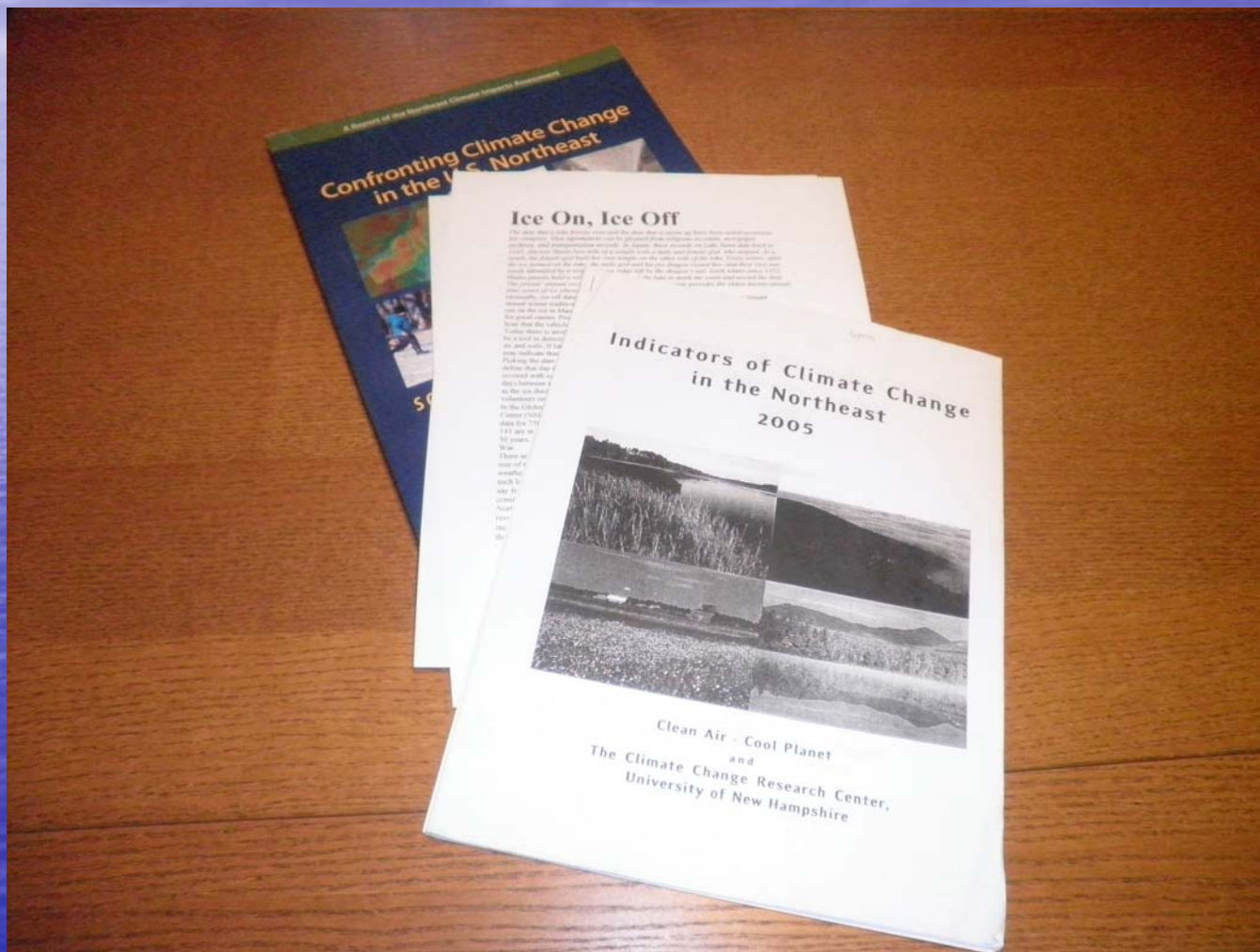
US EPA ARCHIVE DOCUMENT



ICE ON – ICE OFF

CANDLEWOOD LAKE
WINTER 2008-2009

CLIMATE CHANGE



Indicators of Climate Change

- Average annual temperatures
- Length of growing season
- Bloom dates
- Timing of high spring flow and river ice-out
- Lake ice on-ice off dates
- Precipitation
- Sea level rise
- Sea surface temperatures
- Snowfall
- Days with snow on the ground

Information on other lakes

- Madison and Mendota freeze period was 21 days shorter than records from 1850
- Sebago Lake ice has been breaking earlier in the past 150 years.
- Lake Winnepesaukee from 1951 to 2000 froze a full one week earlier than before 1900
- Lake Champlain freezes 8 days later and in over 186 records did not freeze over 31 times

The PROBE



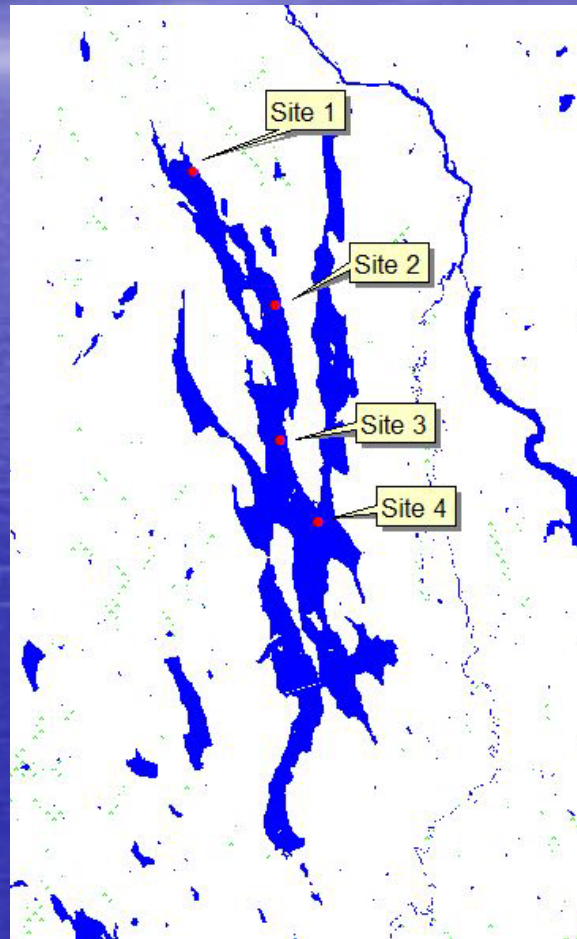
PROBE CAPABILITIES

- WORKS WELL UNDER WATER
- BATTERY LAST MORE THAN 12 MONTHS
- MEASURES LIGHT INTENSITY AND TEMPERATURE
- CAN BE ADJUSTED TO TAKE MEASUREMENTS AT ANY INTERVALS
- IS CHEAP AND SMALL

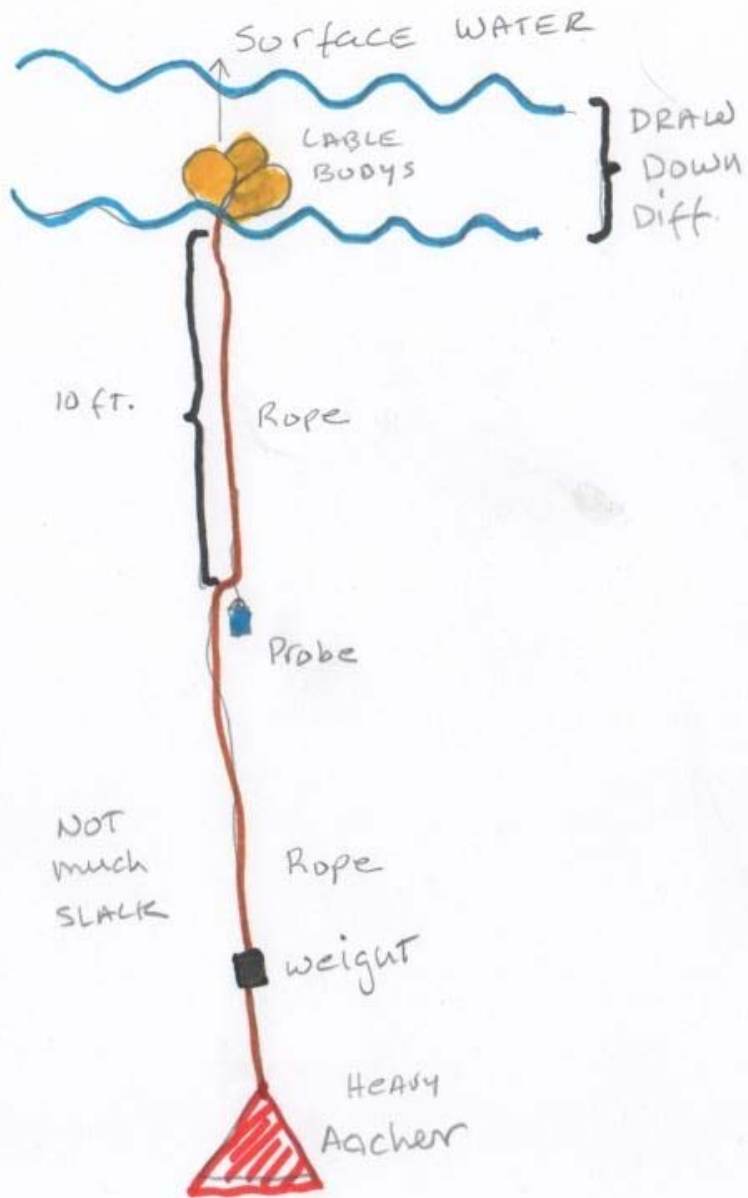
Two words about the lake

- Lake Area 5,064 acres
- Man Made for hydroelectric Power
- Watershed 25,907 acres
- 65 Miles of Shoreline
- Max Depth 89 ft. mean 33 ft.
- Late mesotrophic

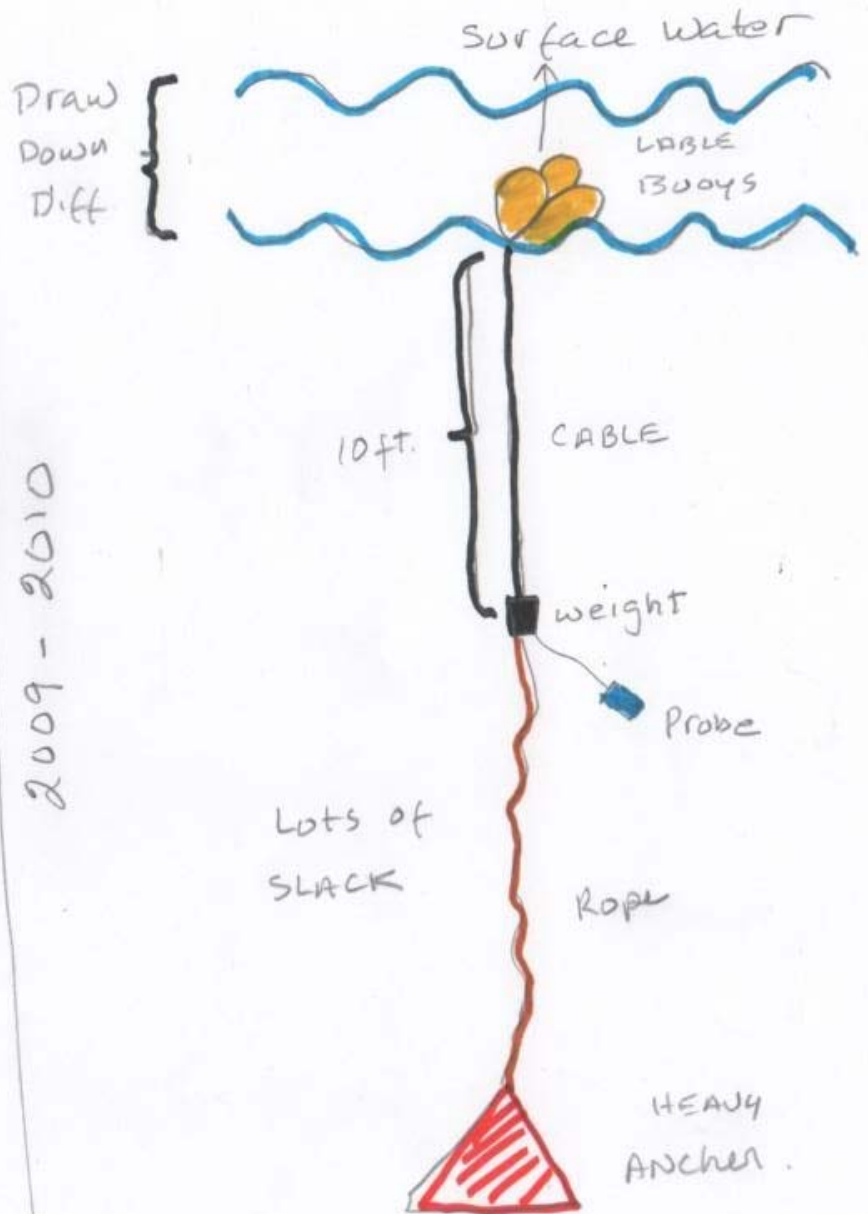
SITE LOCATIONS



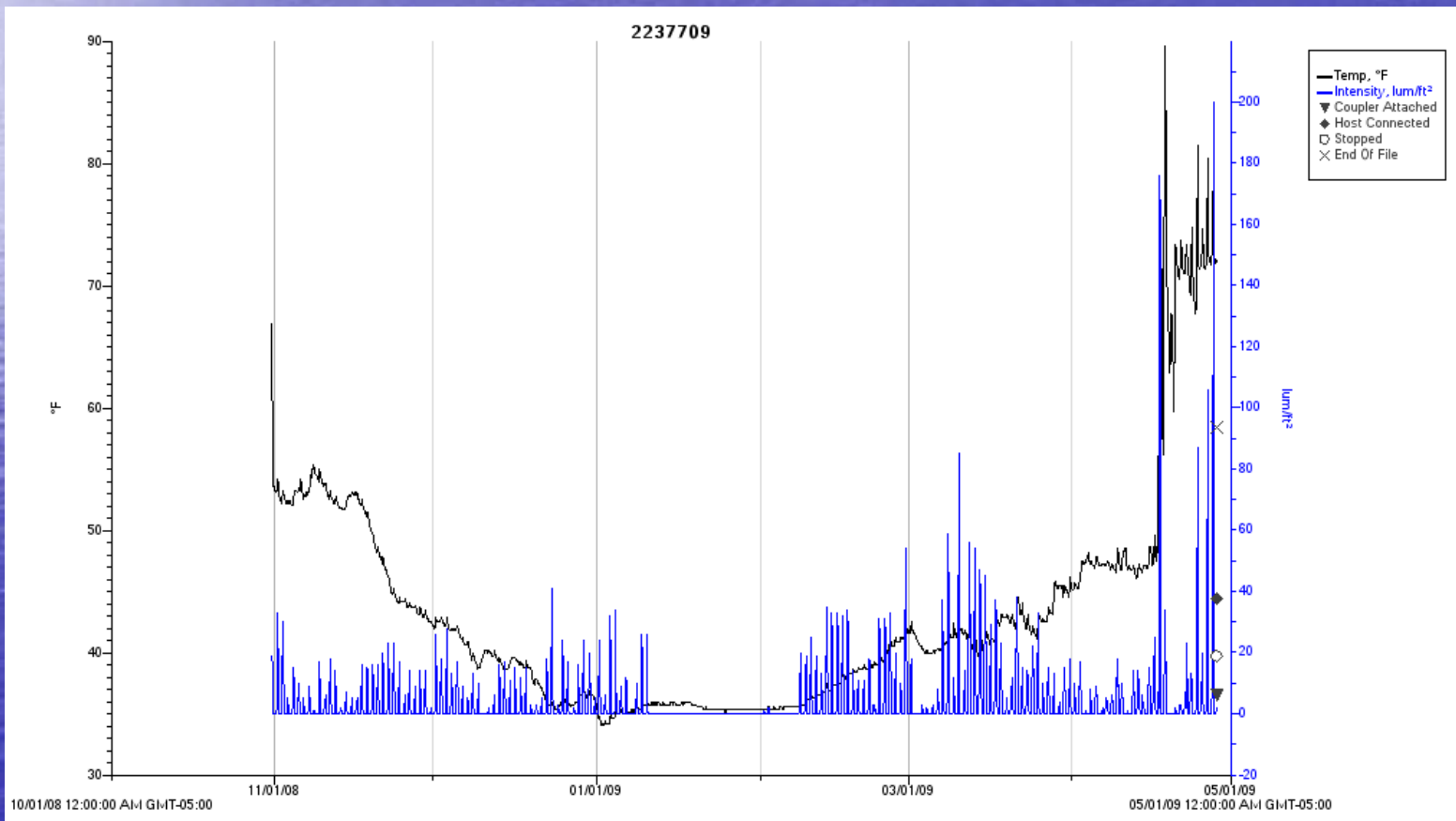
2008-2009



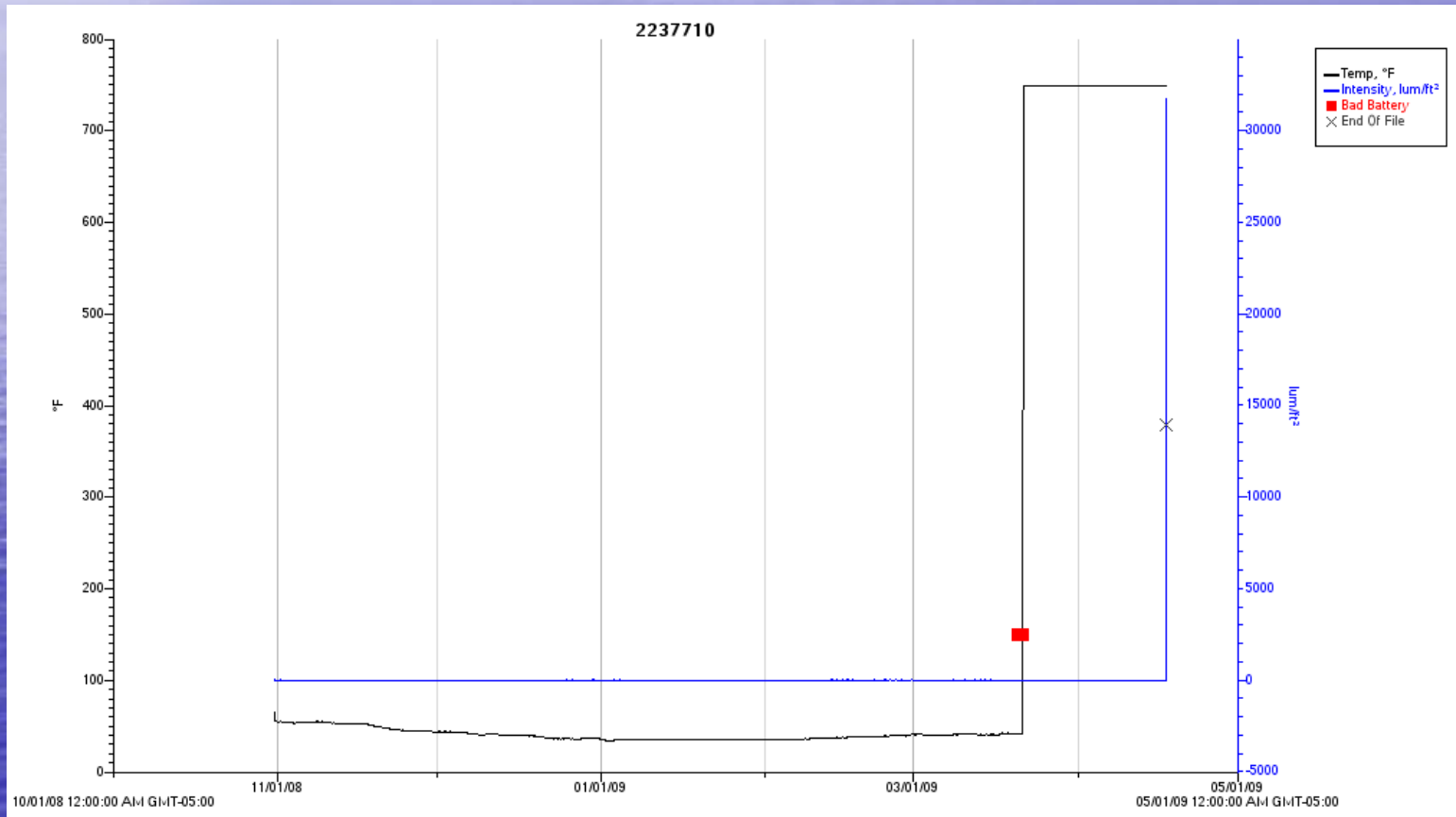
2009-2010



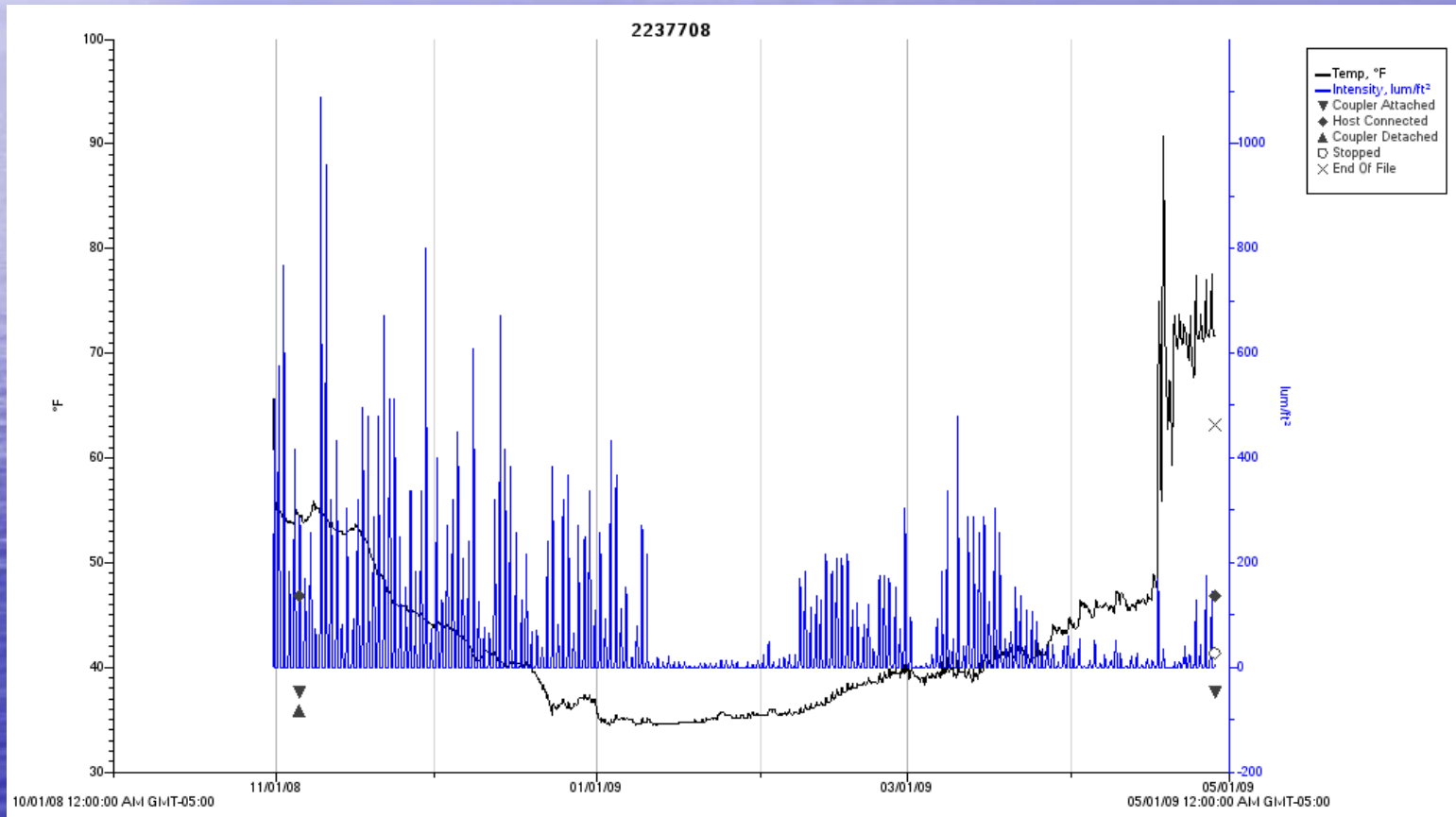
RESULTS Site 1



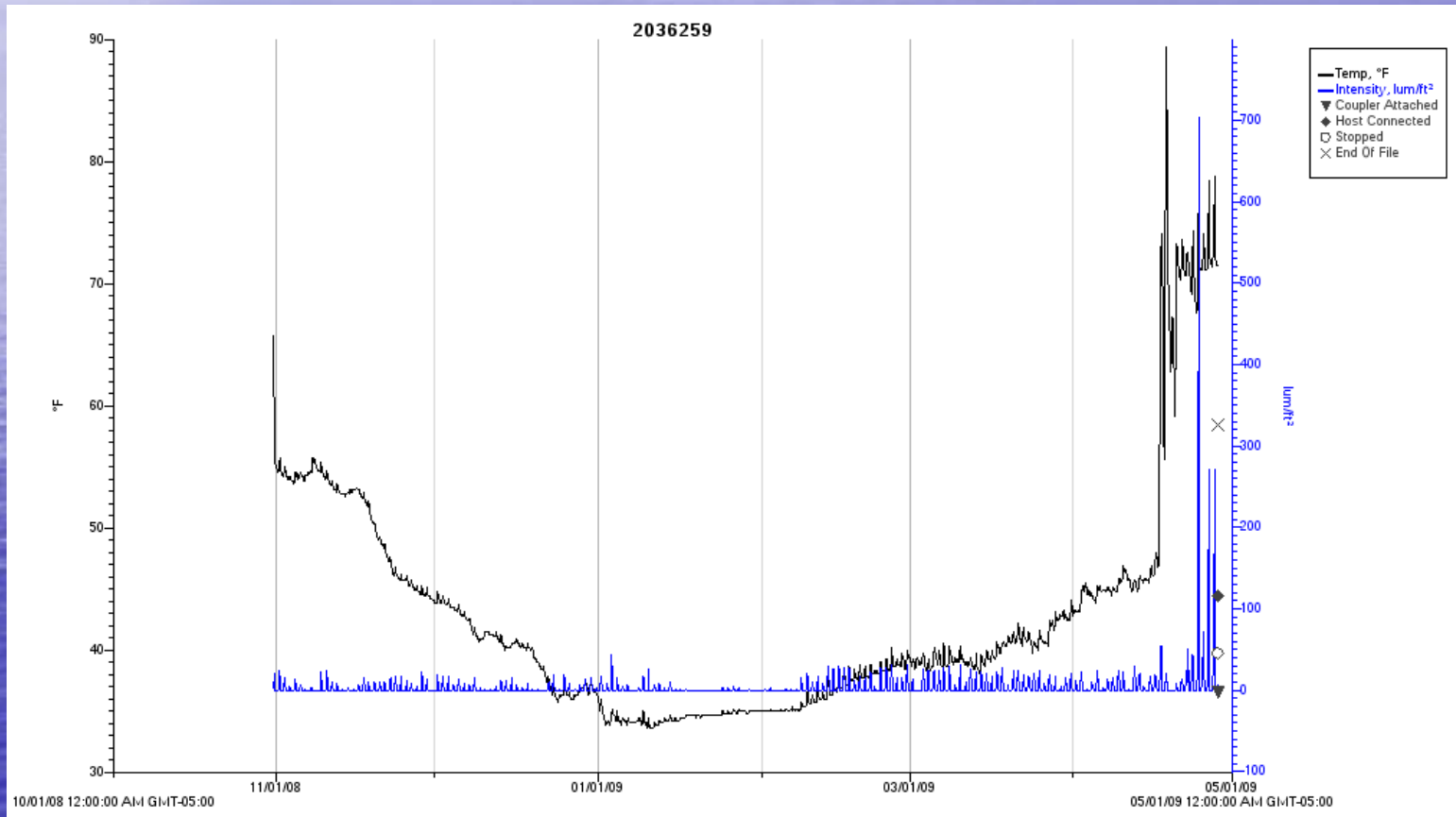
Results Site 2



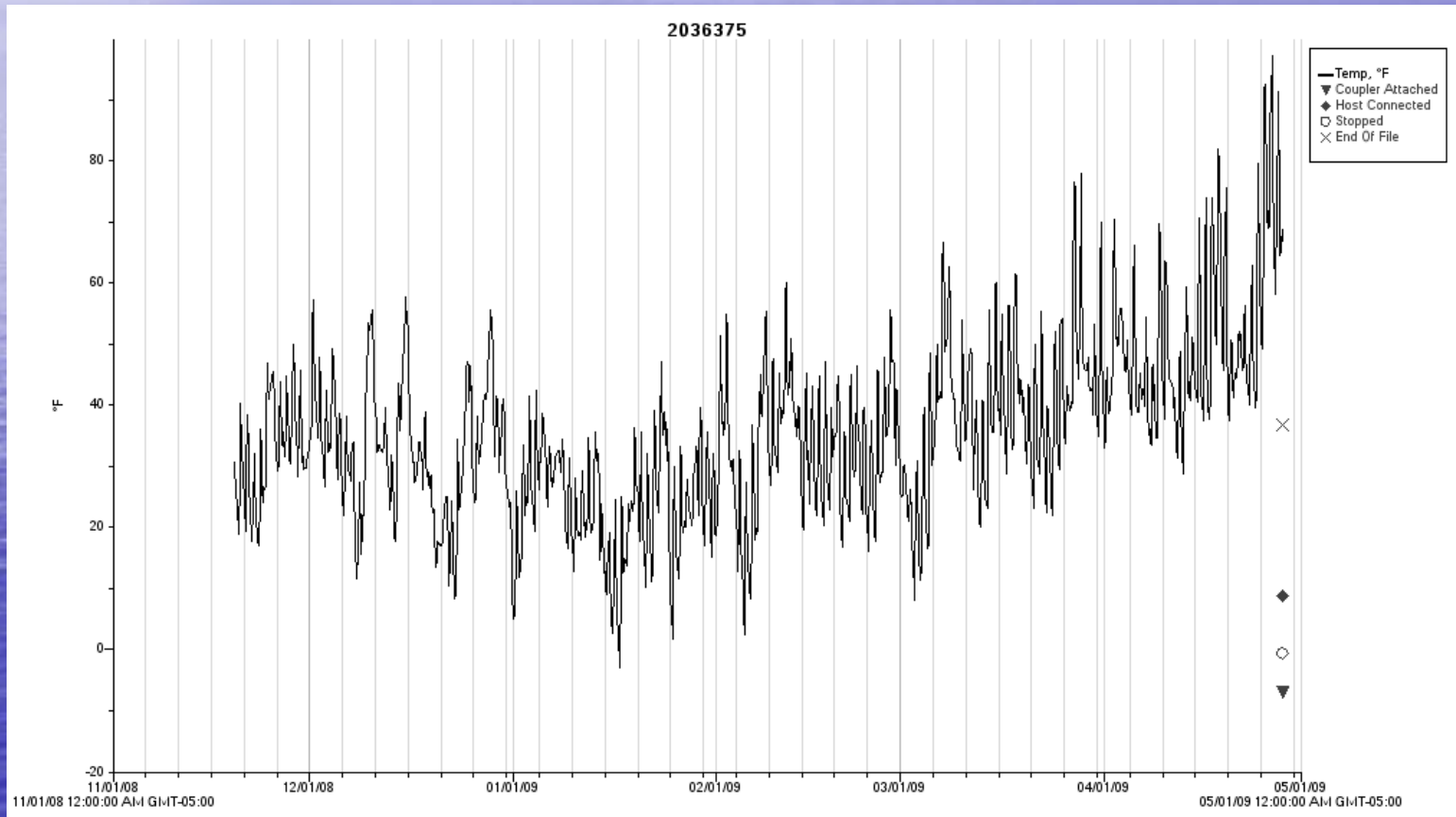
Results Site 3



Results Site 4



Air Temperatures



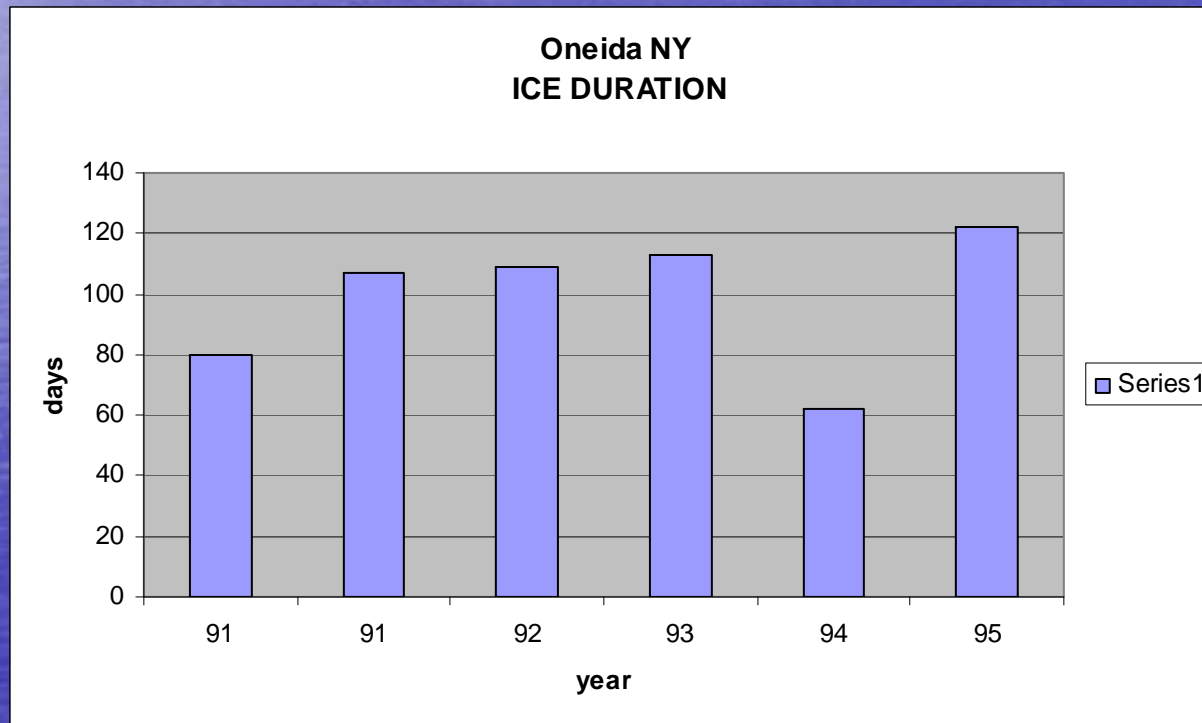
Precipitation

- Considerable precipitation in the form of snow dates:
 - January 7
 - January 29
 - March 9
- These dates do not conflict with graphs.

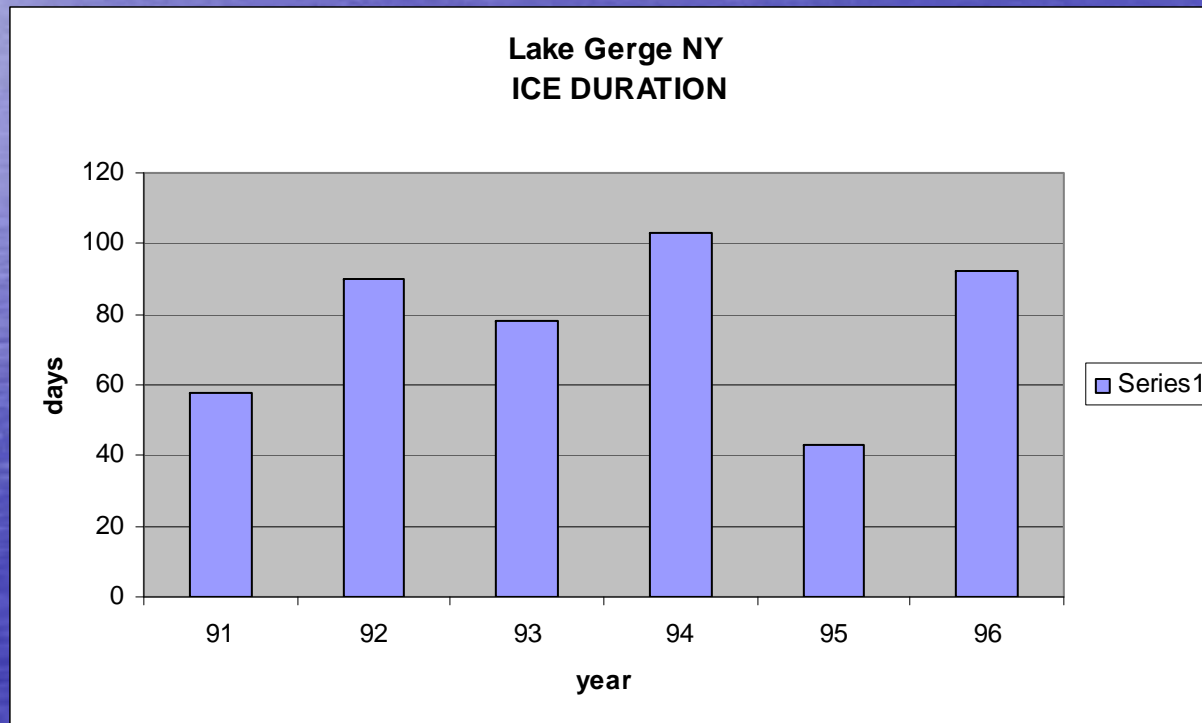
Conclussions

- Ice-on started on January 11
- First Ice-off February 8
- Second Ice-on on March 1
- Second Ice-off on March 5
- Total number of days 33 lake was frozen

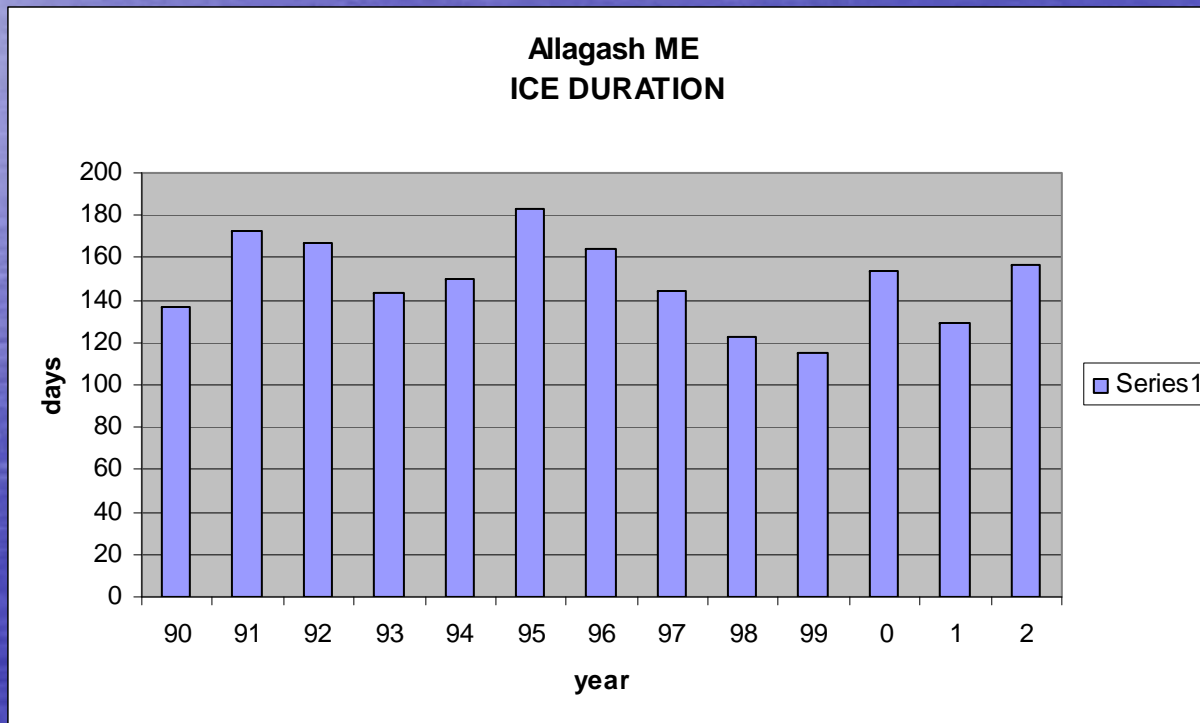
Other Lakes data



Other Lakes Data



Other Lakes Data



- We know that there was considerable amount of ice on areas where there was less wind, water movement, and in shallower locations. Nevertheless, this year the lake had one intensive 30-day freezing event on January 10 and one shorter event in March.
- It will be important to continue this monitoring effort at the same locations in the future to be able to compare freezing dates, length of freezing and also to increase the number of sites to learn more about the relationship between lake depth and ice formation.

Additional Monitoring Information

- Additional Monitoring can be reported to:
- www.natureabounds.org/icewatch/index.htm
 - Citizens Lake Monitoring Network 715-365-8998
Laura Herman
 - University of Wisconsin Steven Point
 - University of New Hampshire
 - U.S. Geological Survey
 - NOAA
 - Your Local Environmental Agency

This research was possible thanks
to:

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- Northeast Naturalist
- Education Connection

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