Effects of climate change on winter flounder and its impacts on fisheries in Narragansett Bay

Spring 2017 RIMFI Update

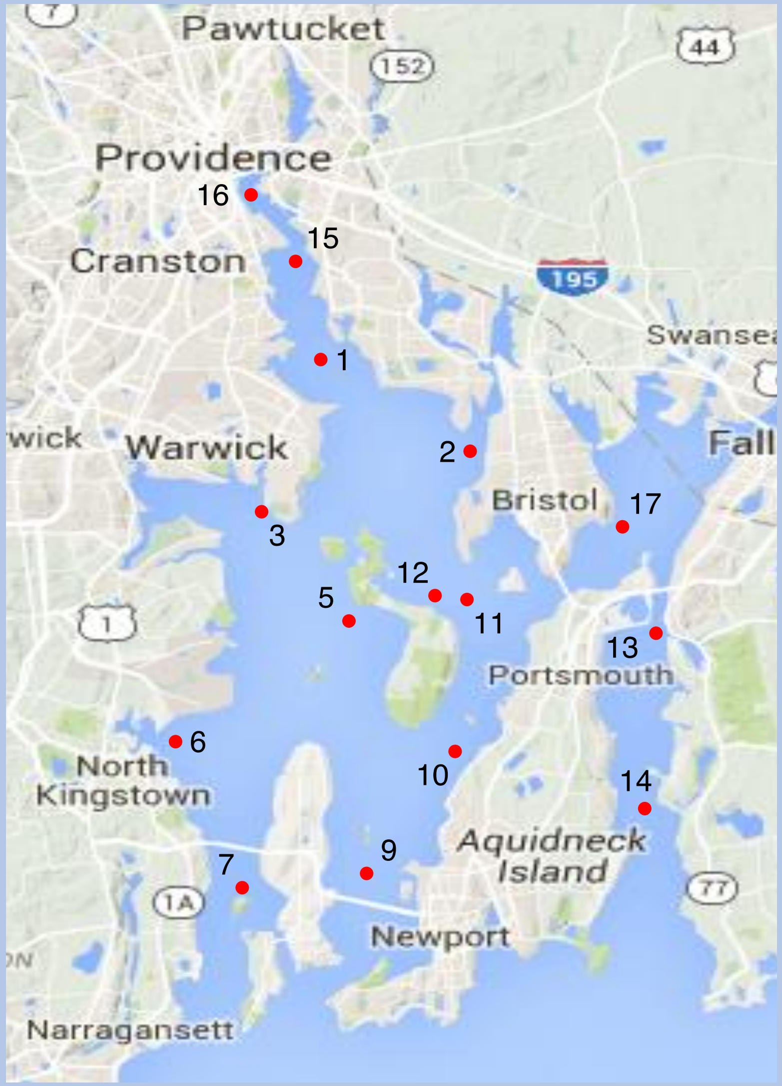
Project Goals

I. Collect larval winter flounder to evaluate spawning habitat and productivity

II. Identify mortality bottleneck(s) in the life cycle and their potential causes

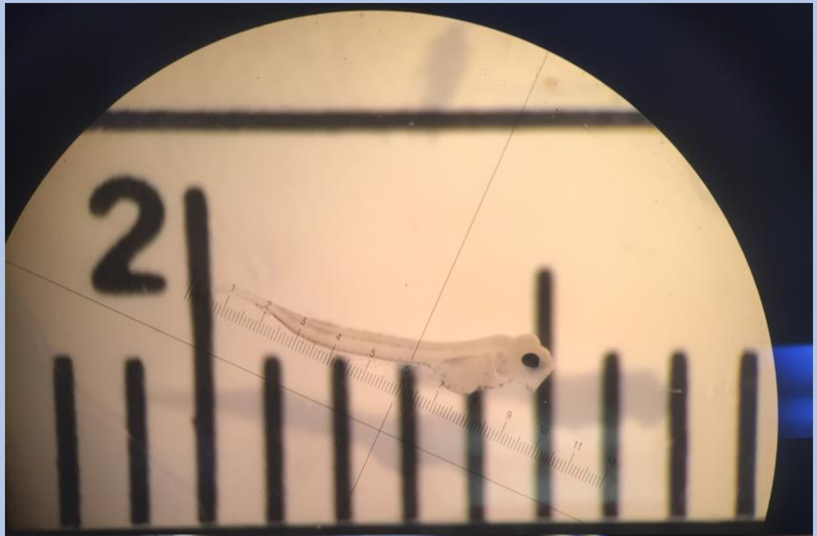
2016 Ichthyoplankton Survey

- Weekly sampling
  - March 1st – April 20th
- Identified all larval fish
  - Winter flounder measured

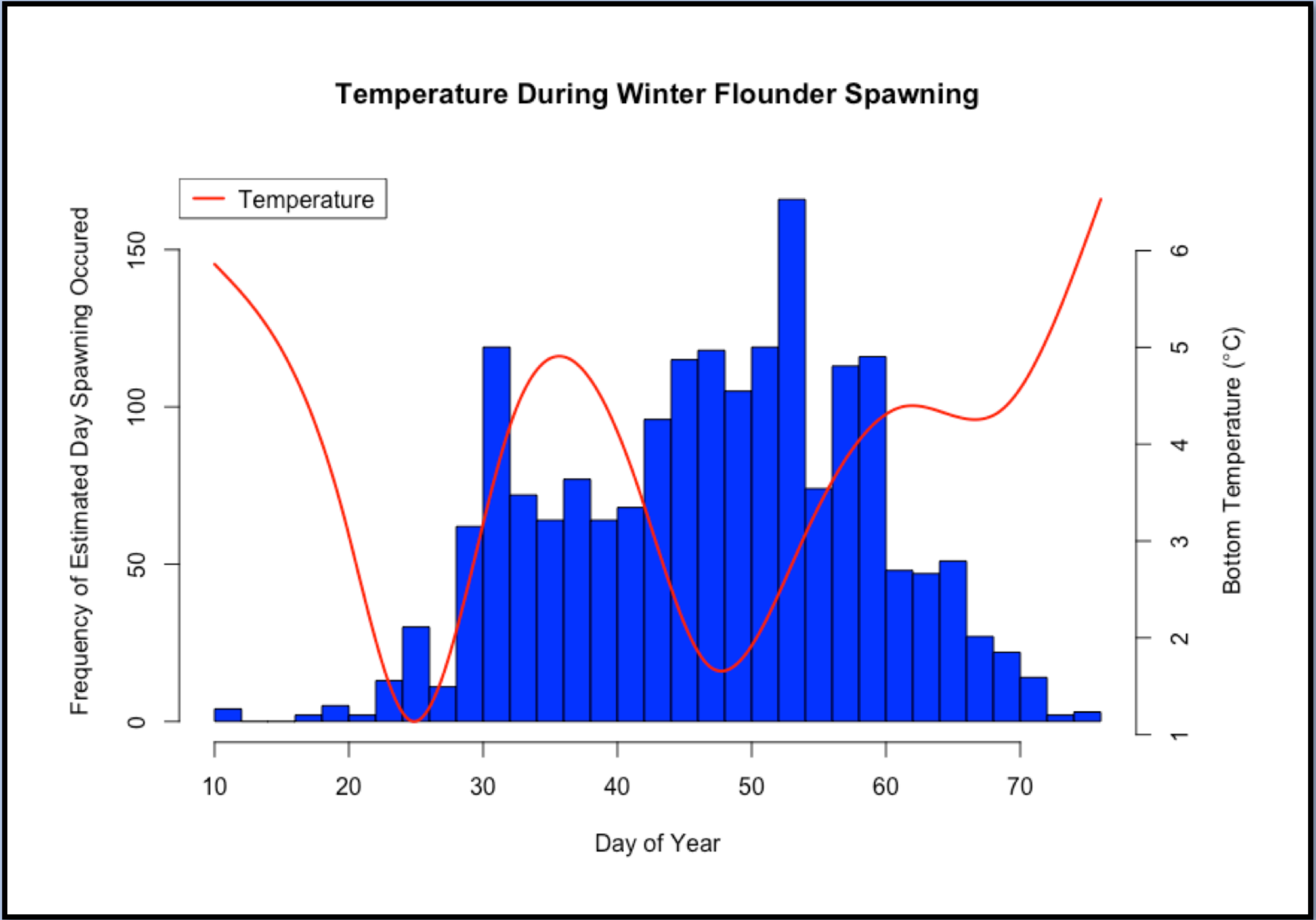


Species Collected

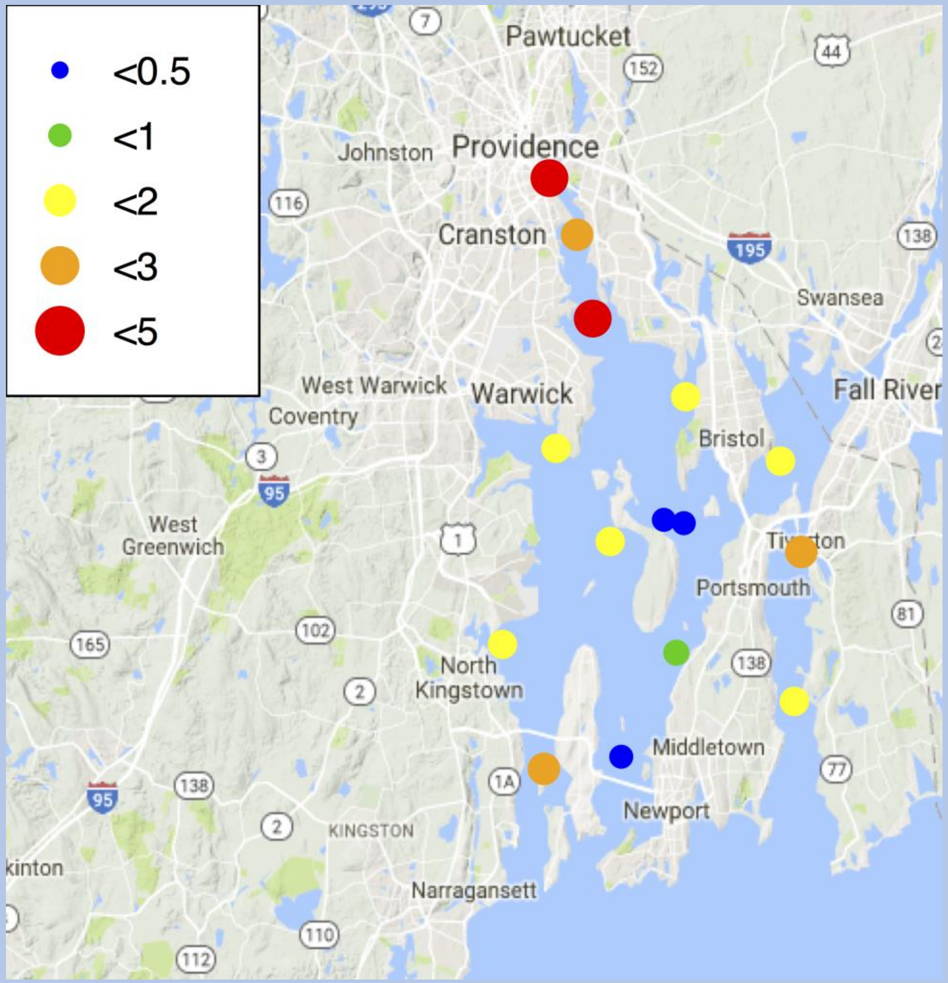
1. Sand lance- 31,778 (92.26%)
2. **Winter flounder- 1,845 (5.36%)**
3. Grubby- 581 (1.69%)
4. **Atlantic herring- 118 (0.34%)**
5. **Atlantic cod- 74 (0.21%)**
6. **Menhaden- 20 (0.06%)**
7. Rock gunnel- 18 (0.05%)
8. **Summer flounder- 7 (0.02%)**
9. Fourspot flounder- 2 (0.01%)



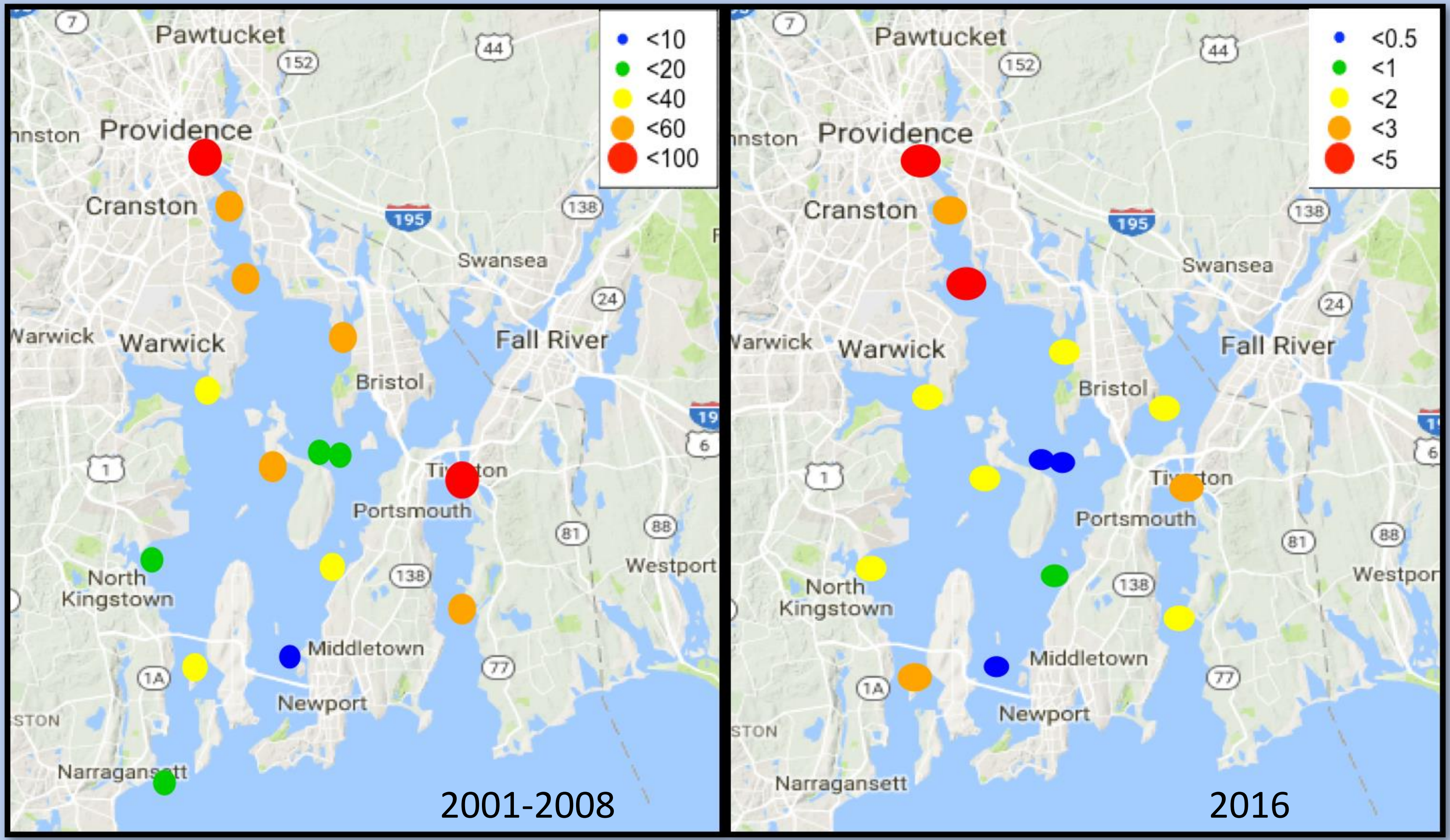
Winter Flounder Spawning



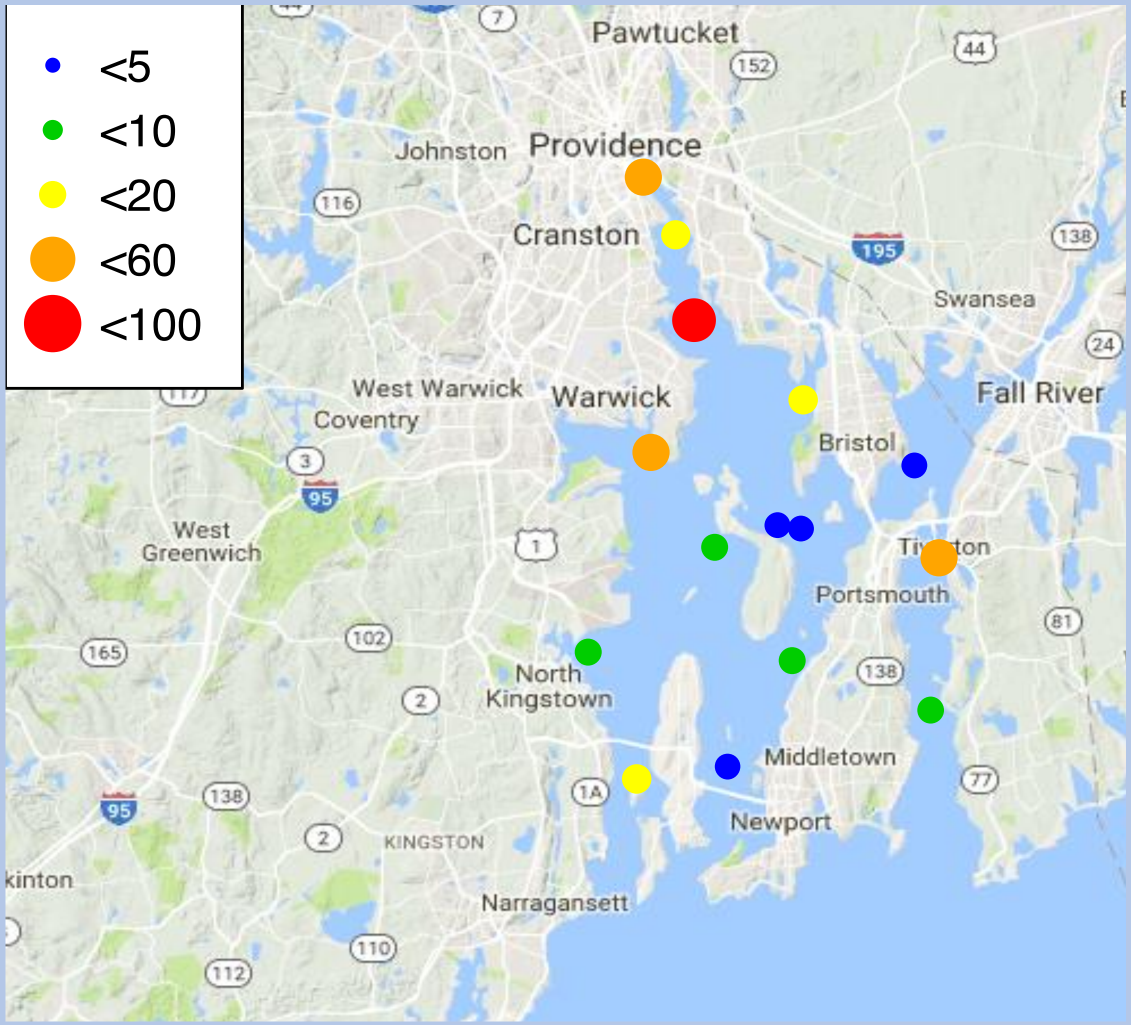
WF Larval Density (Number per 100m^3)



Larval Density: 2016 vs 2001-2008



Number of Newly Hatched WF Larvae



Summary

- Spawning occurred from late-January to early-March
  - Coldest portion of the year
- Larval density decreased 20x from the 2001-2008 average
- Spawning contracted toward the northwest portion of the Bay
  - Greenwich Bay, northern Sakonnet River, and the Providence River

Questions for 2017

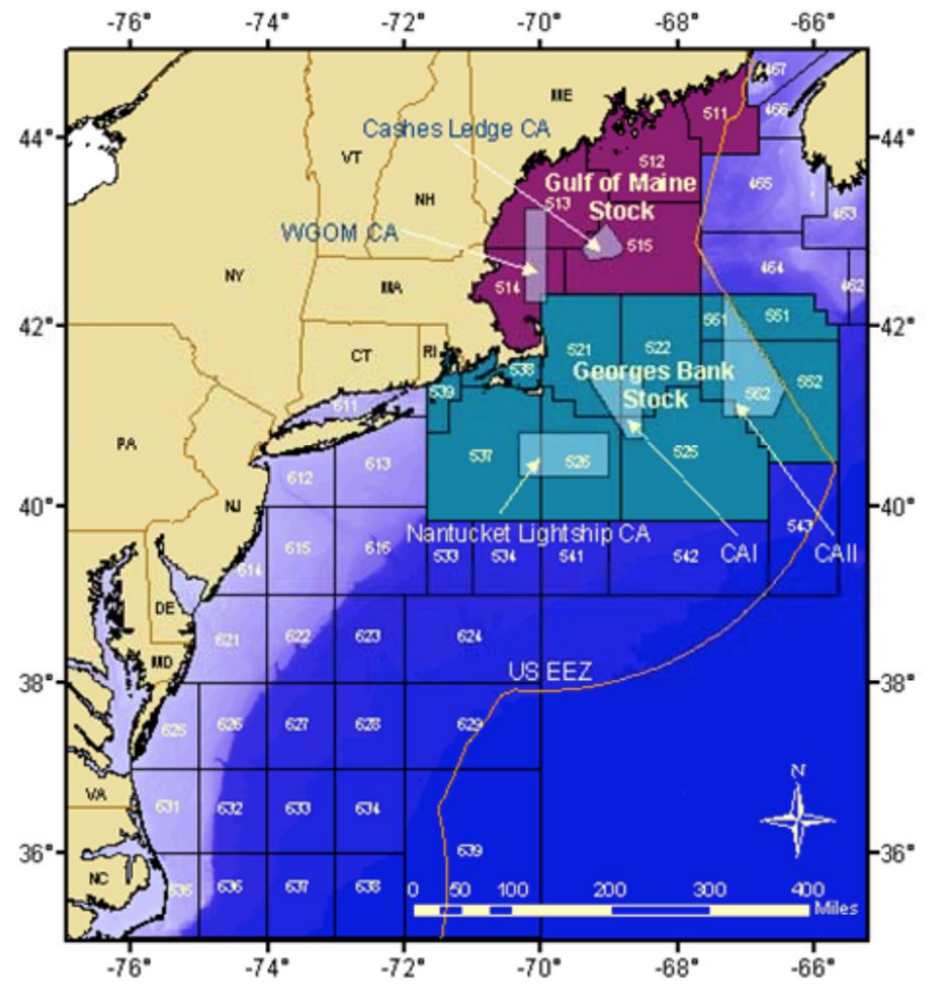
- Impact of temperature
  - 2016- warm spring and El Niño
  - 2017- cold spring with delayed warming

- 2016 patterns persist?

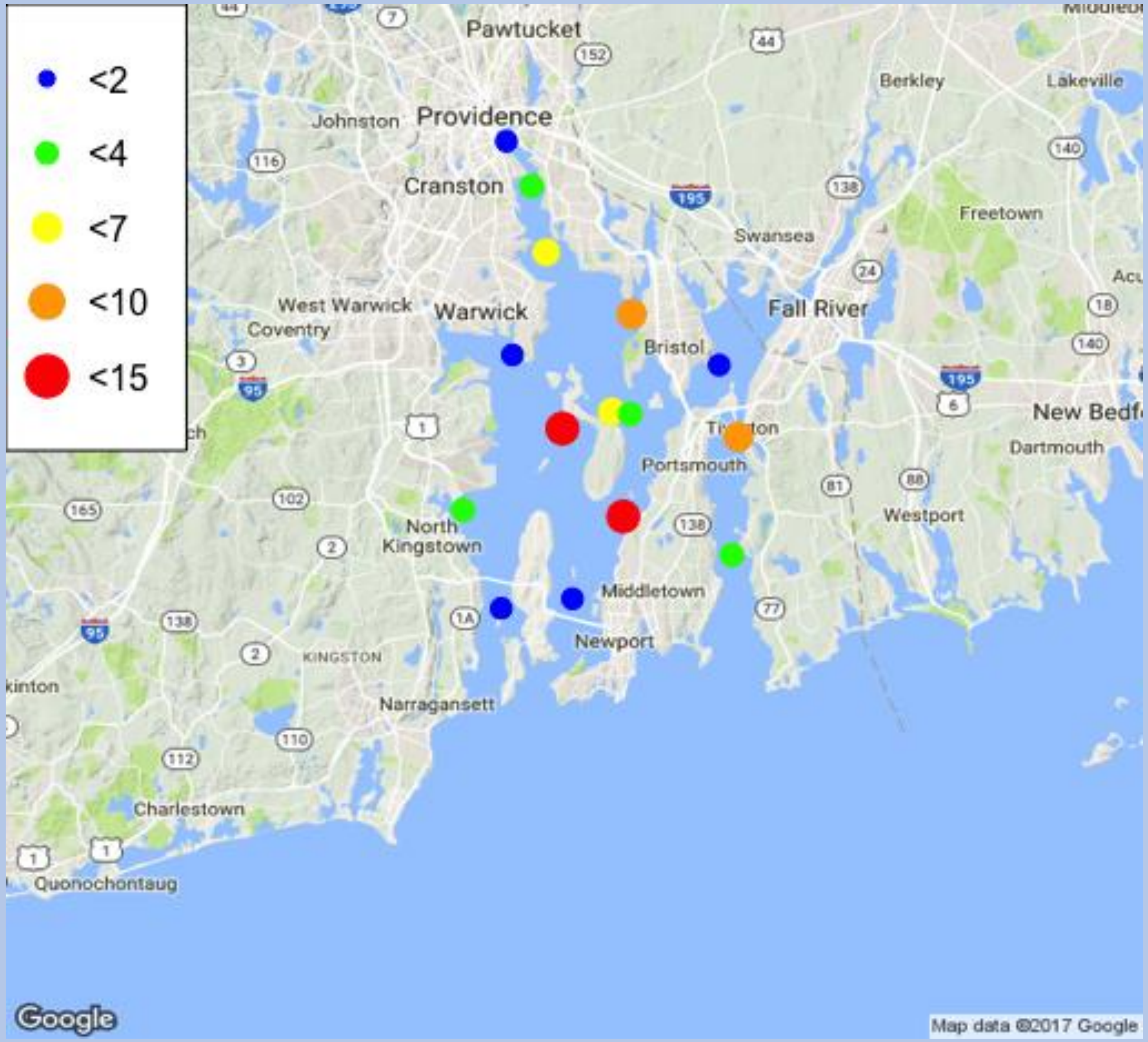
Narragansett Bay- Cod Nursery???

What Do We Know About SNE Cod?

- Not much!
- Part of the George's Bank Stock?
  - Not included in stock assessment
  - Evidence of a self-sustaining sub-population
- Spawning occurs on Coxes Ledge
- No other significant monitoring



Our Larval/Juvenile Cod Catch



DEM Survey Catch of Young of the Year Cod

Preliminary Conclusions

- SNE cod are at least partially self-sustaining
- Spawning seems to occur from January to mid-February
    - Coxes Ledge/Block Island? Elsewhere?
- YOY cod use the Bay and South Shore as a nursery
    - Head to deeper water for their first summer
- Join adults offshore at age-1
- Feed on herring very close to shore in the Fall
- A LOT still to learn!!!

Questions?