

RBR

Welcome, the RBR Webinar will begin shortly...



RBR

rbr-global.com

Product Overview: RBR*concerto*³ CTD

Eric Siegel
Sales Director



Loggers



OEM

Sensors



Systems



RBR



RBR

Sensor	Accuracy
Conductivity	± 0.003 mS/cm
Temperature	$\pm 0.002^{\circ}\text{C}$
Depth	$\pm 0.05\%$ FS



RBRconcerto³ C.T.D

240 million readings, up to 32Hz sampling

Available configurations: RBRconcerto³ C.T.D|fast8, RBRconcerto³ C.T.D|fast16, RBRconcerto³ C.T.D|fast32

750m, 2000m, and 6000m ratings

USB-C download

Twist Activation and Wi-Fi

RBR

Community Science Programs

Glen Gawarkiewicz (WHOI) works with inshore scallop fisherman Mike Marchetti, aboard the F/V *Mister G*, off Point Judith, RI. (Courtesy of Commercial Fisheries Research Foundation)



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RBRconcerto³ C.T.D+

240 million readings

Up to 5 channels combinations: T.ODO, Fl, Tu, pH, PAR, ORP, etc...

750m, 2000m, and 6000m ratings

USB-C download

Twist Activation and Wi-Fi

RBR

RBR*brevio*³ C.T.D

- 4 AA batteries
- Has exactly the specifications as the RBR*concerto*³ C.T.D, sampling regimes (|deep, |fast8)



RBR*maestro*³

- Same logger body as the RBR*concerto*³
- Up to 10 channels combinations: T.ODO, Fl, Tu, pH, PAR, ORP, etc...



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Small Boat Surveys



RBR

Twist/Wi-Fi

Twist Activation

- Can be used on all Standard (white with red end-cap) loggers
- Shipped with “Twist” activated so you can immediately start sampling
- Twisting also turns on Wi-Fi...



Why Use Wi-Fi?

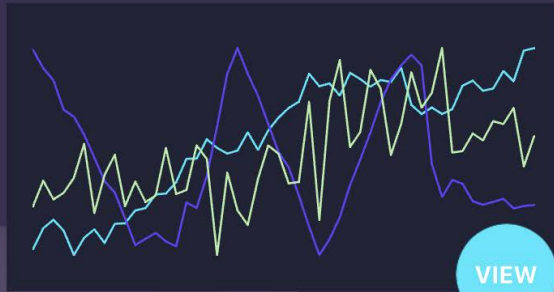
- Download data without opening logger
 - Avoid moisture getting inside logger
 - Process cast data on cruise
 - Get months of data off logger
- See data in real-time/quickly
 - Community science groups
 - Strategic water sampling
- Flexible
 - Can use Wi-Fi with Ruskin Mobile app (phone, tablet, iOS, Android)
 - Can use Wi-Fi with Ruskin Desktop (Mac and PC)



RBR

RBRconcerto³ 060614

925 SAMPLES | OFF PAUSED | 32Hz RATE



VIEW

LAST TAGGED LOCATION:

Logged automatically at 17:50

44.6624 LATITUDE | -63.5566 LONGITUDE | 48m ACCURACY

TAG CURRENT LOCATION: 44.6623, -63.5569, (64m)

MEASURED CHANNELS:

Conductivity (mS/cm)

STOP DEPLOYMENT

Datasets

Local Datasets

- GPS Track 2:46pm on 31 Mar '20 2kB
- GPS Track 2:30pm on 26 Mar '20 215kB
- RBRconcerto3 060614 5:39pm on 12 Feb '20 164kB
- RBRconcerto3 060614 2:58pm on 5 Feb '20 80kB
- RBRconcerto3 060614 1:35pm on 3 Jan '20 244kB
- RBRconcerto3 060614 1:34pm on 3 Jan '20 96kB
- RBRconcerto3 060614 10:44am on 7 Aug '19 136kB
- RBRbrevio3 060694 11:29am on 5 Jun '19 872kB
- GPS Track 5:50am on 5 Jun '19 945kB

Locations

Sample Dataset 1

An example dataset with waypoints



Profile 5 of 10
8 March 2018

DOWNCAST

- Start time: 11:52:59
- End time: 11:56:42

UPCAST

- Start time: 11:56:42
- End time: 11:58:05

[VIEW CHART](#)

Deployment Considerations



simRBRconcerto³ 904031

Configuration Information Calibration Parameters

Schedule

Status: **Not enabled**

Clock: 2020-07-14 12:56:38-03:00 UTC Local

Start: **Not available with twist activation**

End: Gated **38.2 days** **+16.2 days**

Power

Battery: Lithium thionyl chloride Fresh

External: None Fresh

Extended battery endcap

Sampling

Mode: Continuous

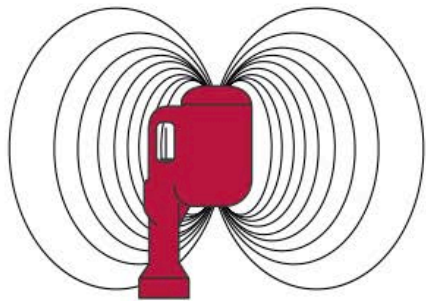
Speed: Rate 16Hz

Gating

Mode: Twist activation

Upcoming Webinars

Future Webinars



Inductive-Conductivity Cell: A primer on high-accuracy CTD technology

Greg Johnson

August 12, 2020 at 12PM EDT

Review the 2020 Sea Technology paper describing operating principles, accuracy and stability, and deployment guidance for the unpumped inductive conductivity cell.

[Register for the Webinar](#)



Wave energetics in a complicated reef environment; observations and modeling.

Camilla Tognacchini (University of Hawaii)

August 19, 2020 at 12PM EDT

RBR*so*³ D data is used to validate modeled wave energetics along West Maui, enlightening energy transformations and run-up components.

[Register for the Webinar](#)

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Thank You

Contact Us

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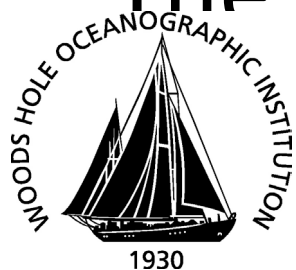
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Community Science in New England. The CFRF/WHOI Shelf Research Fleet



Glen Gawarkiewicz
Woods Hole Oceanographic Institution
RBR Webinar August 5, 2020

Frank Bahr WHOI
Aubrey Ellertson and Dave Bethoney CFRF
Anna Mercer, Shelf Fleet Alumnus

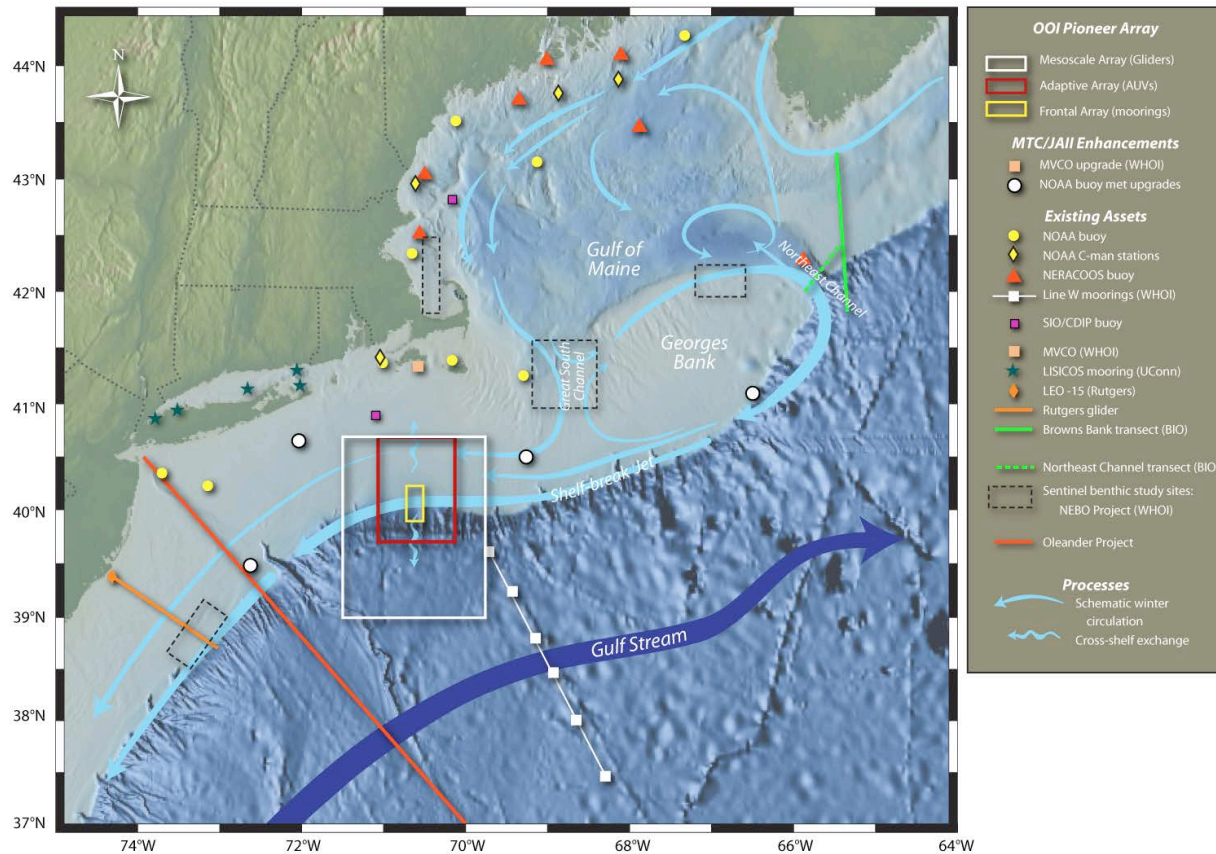


Outline

- Introduction- Origins of the Shelf Research Fleet
- Data Collection
- Recent Change in the Gulf Stream and Slope
- Extreme Event Detection- The Marine Heatwave of 2017
- Studying Processes- Salinity Maximum Intrusions
- Future Directions

Getting Acquainted: National Science Foundation Ocean Observatories Initiative Pioneer Array

Public Hearings- Early 2011 Multi-Use Negotiations- Fall 2011

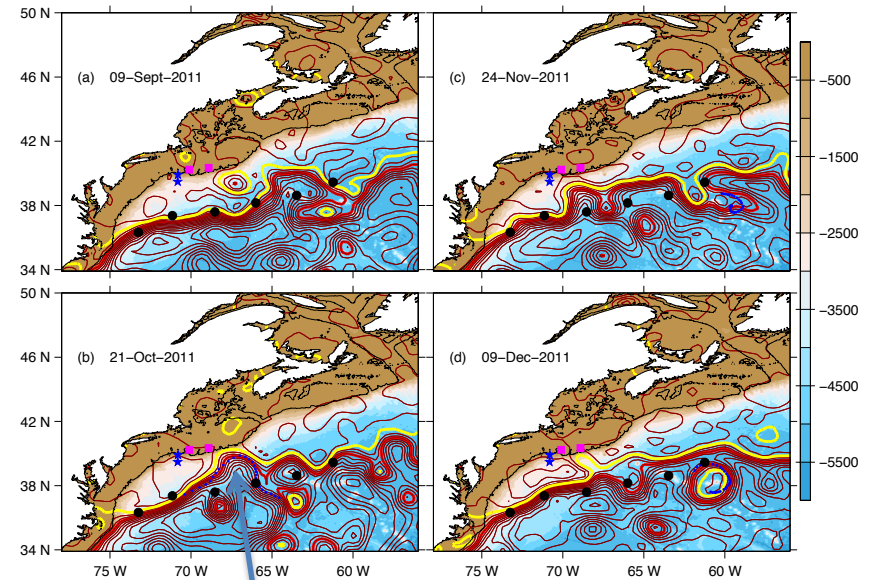
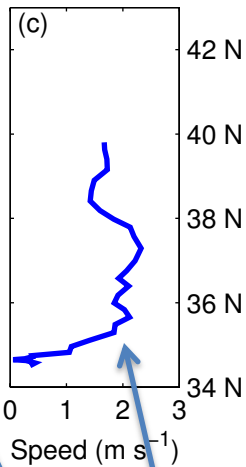
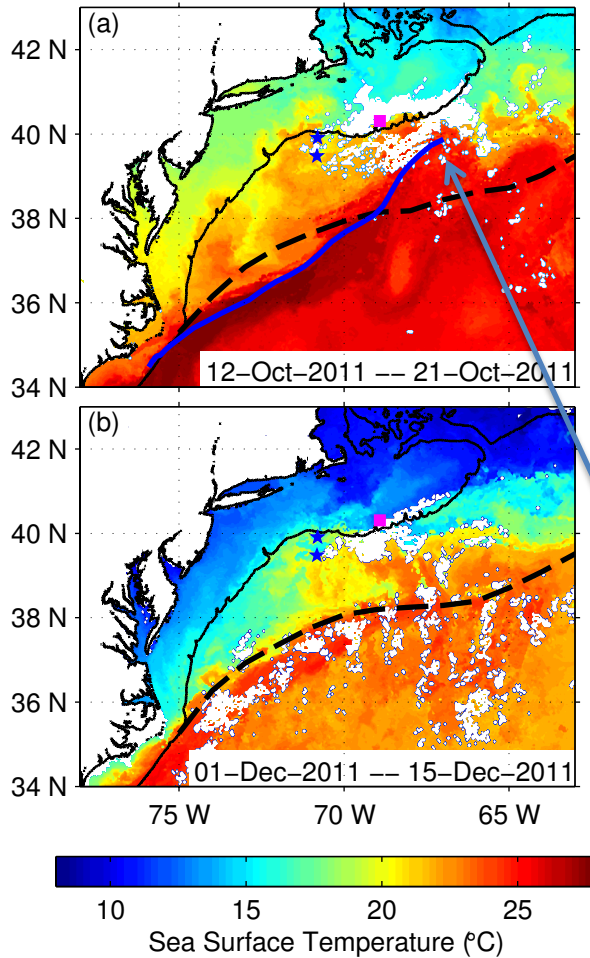


Yellow Rectangle- Mooring Array

Red Rectangle- AUV operational area (REMUS 600)

White Rectangle- Glider operational area (Slocum)

First Scientific Interaction- Gulf Stream Diversion to Shelfbreak in 2011



Drifter shows
4 knot current
almost hitting
shelfbreak

Sea Surface Height Anomaly
Shows North Wall of Gulf Stream
Very close to Shelfbreak in
October

Sampling Strategy and Science Goals for Shelf Research Fleet

- Get fishing vessels to take regular CTD profiles across continental shelf south of New England at 1 week intervals
- Choice of CTD crucial- Wireless, accuracy, ease of iPad interface (Ruskin) **RBR Concerto**
- Divide shelf into 6 zones stretching between Montauk Point and Martha's Vineyard
- Establish multi-year sampling to examine seasonal and inter-annual variability
- Key aspect- Regular meetings to discuss science results and impact of oceanographic processes and variability on catch

Training-October/November 2014



Anna Mercer

RBR Concerto!!!

Frank Bahr

Profiles to Date- July 30, 2020

Website

<http://science.whoi.edu/users/seasonar/whoicfrf>

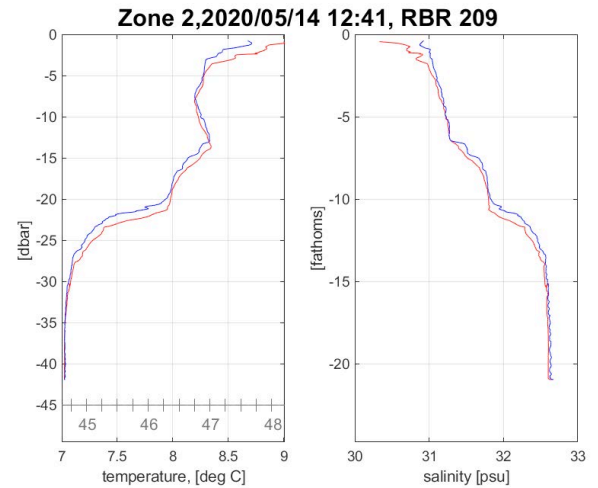
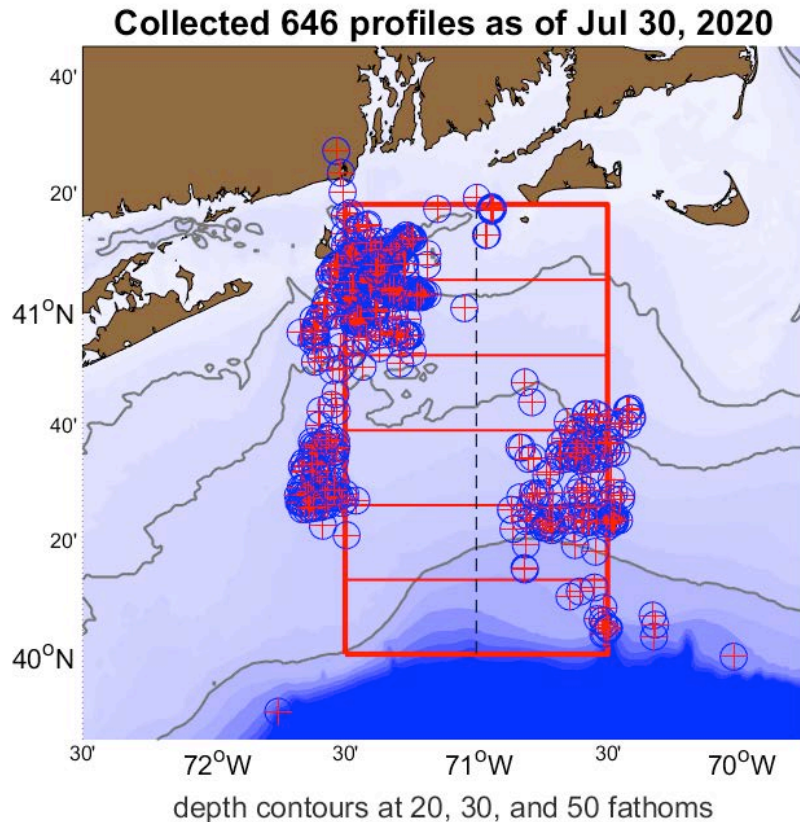


Figure courtesy
Frank Bahr

Key Aspect- Regular Interactions

Preparing for a profile
In inshore waters with
M. Marchetti



About to take a profile with M. Marchetti

Annual Meeting in late
January- Generally runs
2 hours- LOTS OF DISCUSSION

Anywhere from 15-40 participants
depending on weather

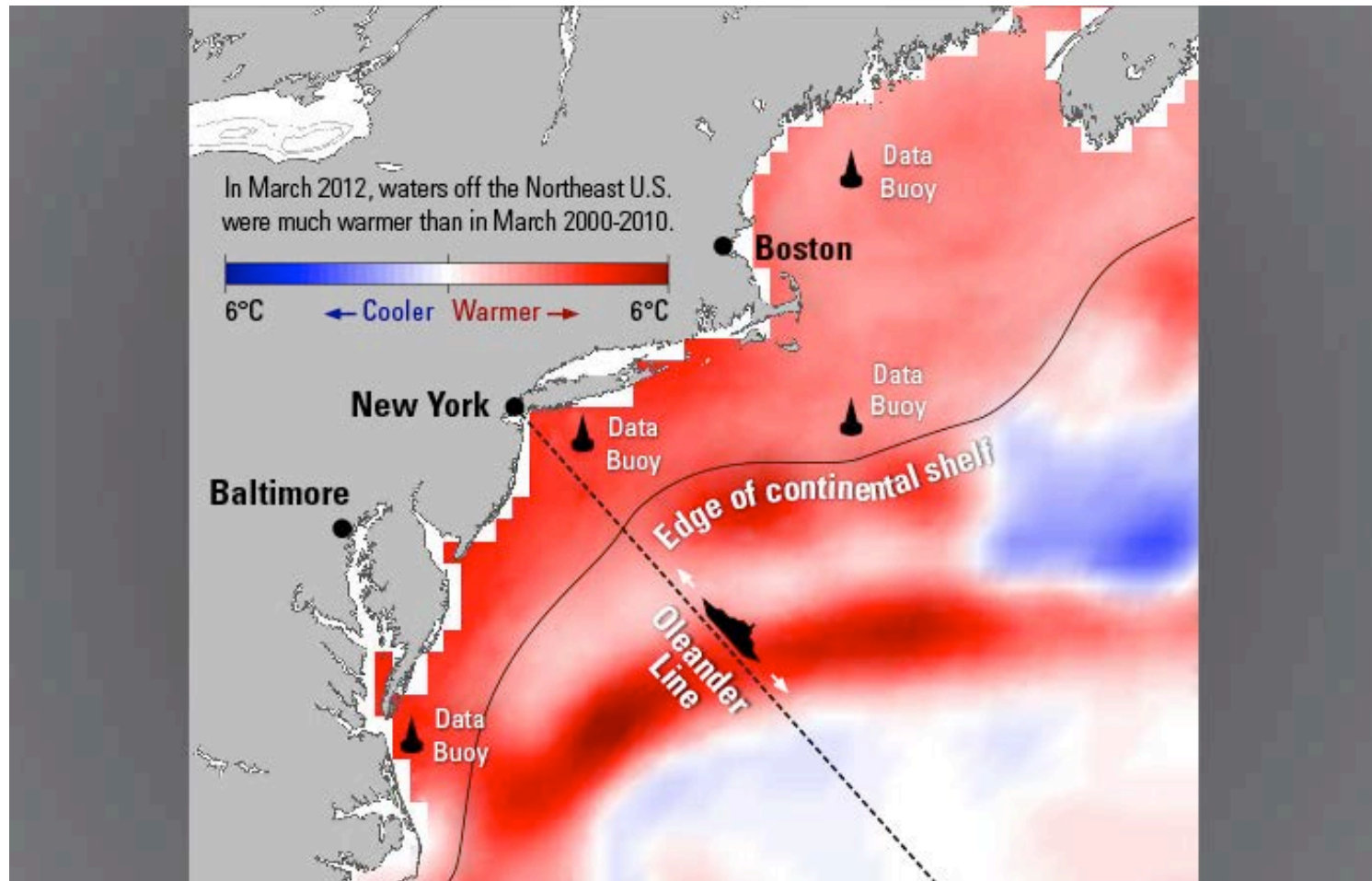


Meeting at Commercial Fisheries Center (URI)

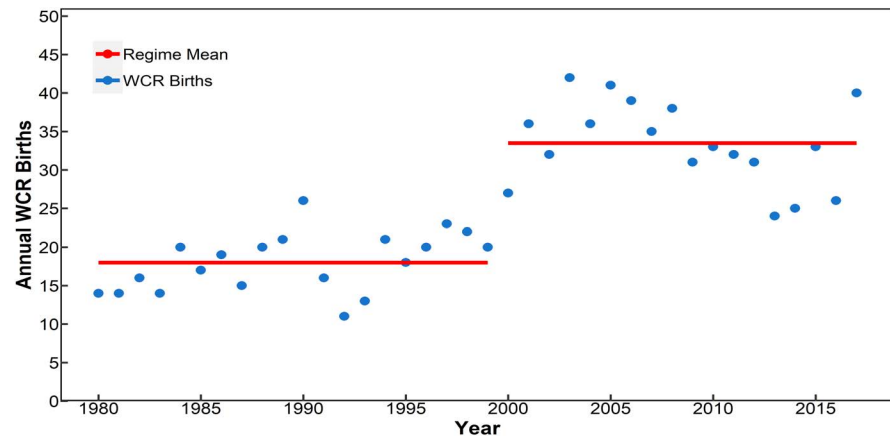
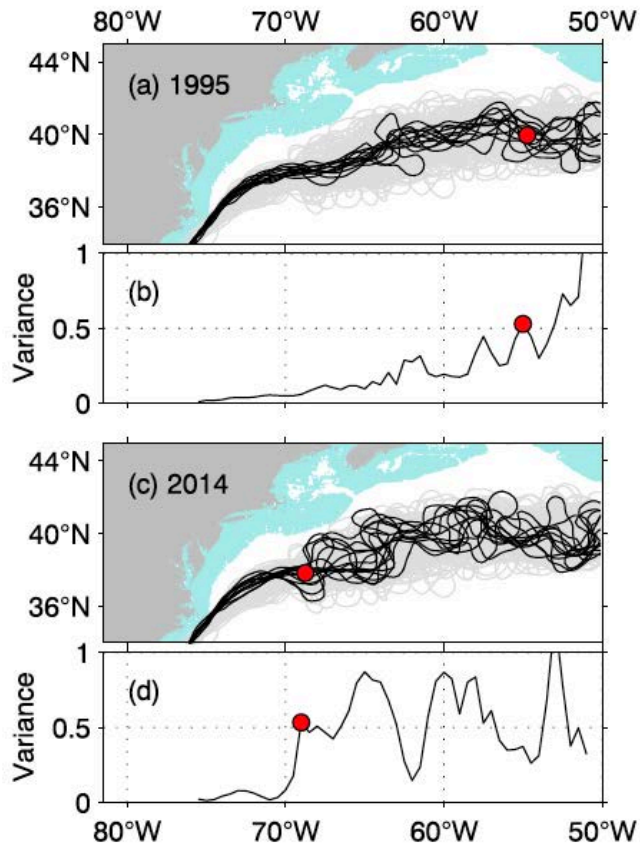
RECENT CHANGE-ATMOSPHERIC FORCING

SST Anomaly for March 2012

Maximum of 6 Deg. C- Jet Stream anomaly



RECENT CHANGE-GULF STREAM MEANDERING AND WARM CORE RINGS



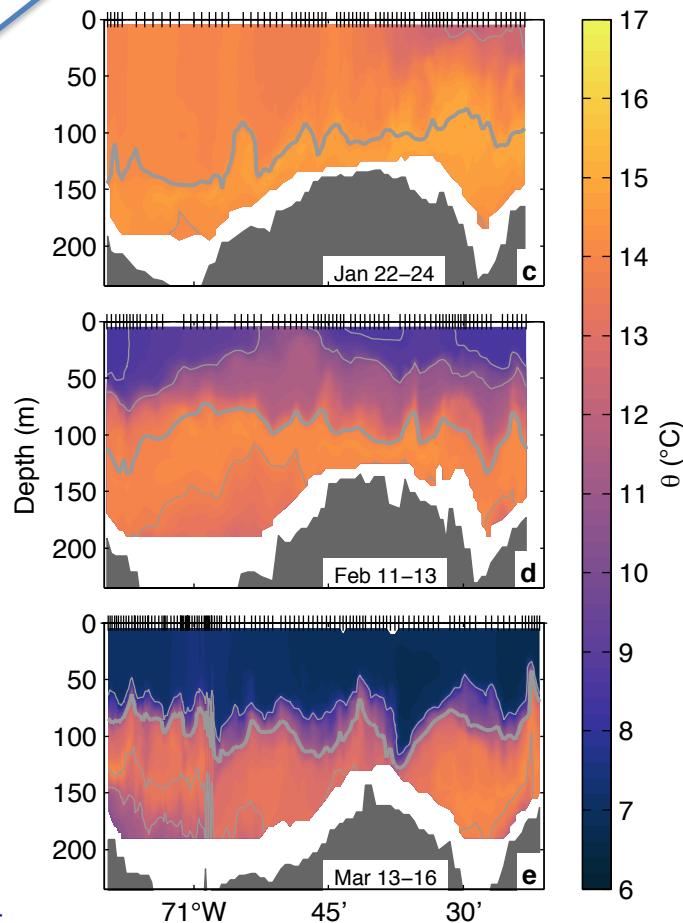
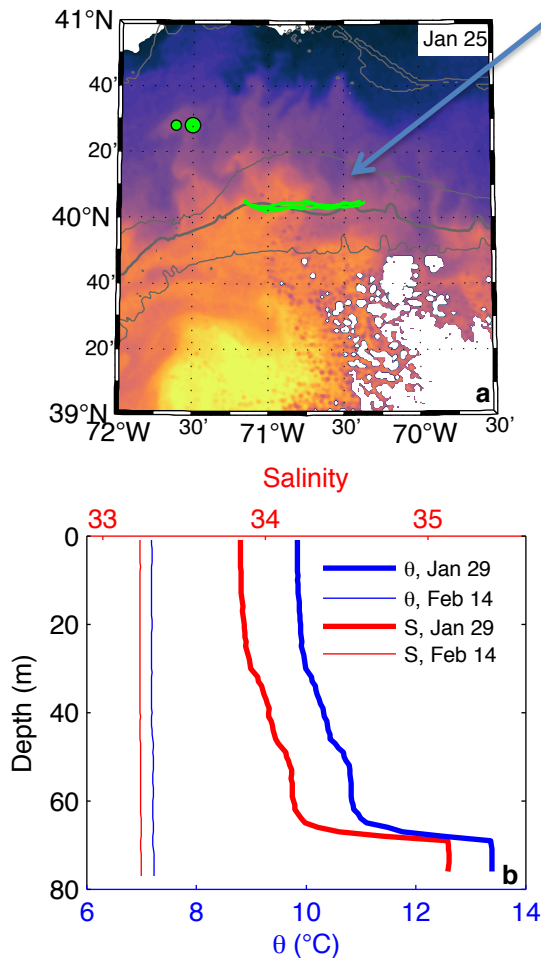
Warm Core Ring Formation rates
1980-1999 18 per year
2000-2017 33 per year

Meanders larger, begin further west
Andres, 2016

Gangopadhyay et al., 2019

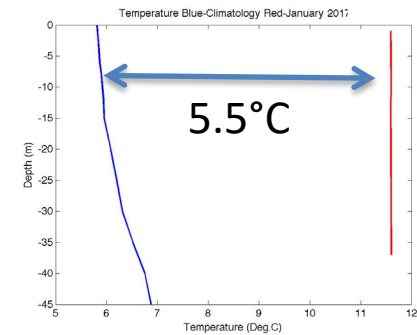
Shelf Fleet Detection of Extreme Event Massive Ring Intrusion- January 2017

Pioneer Glider Data



Climo

1/17

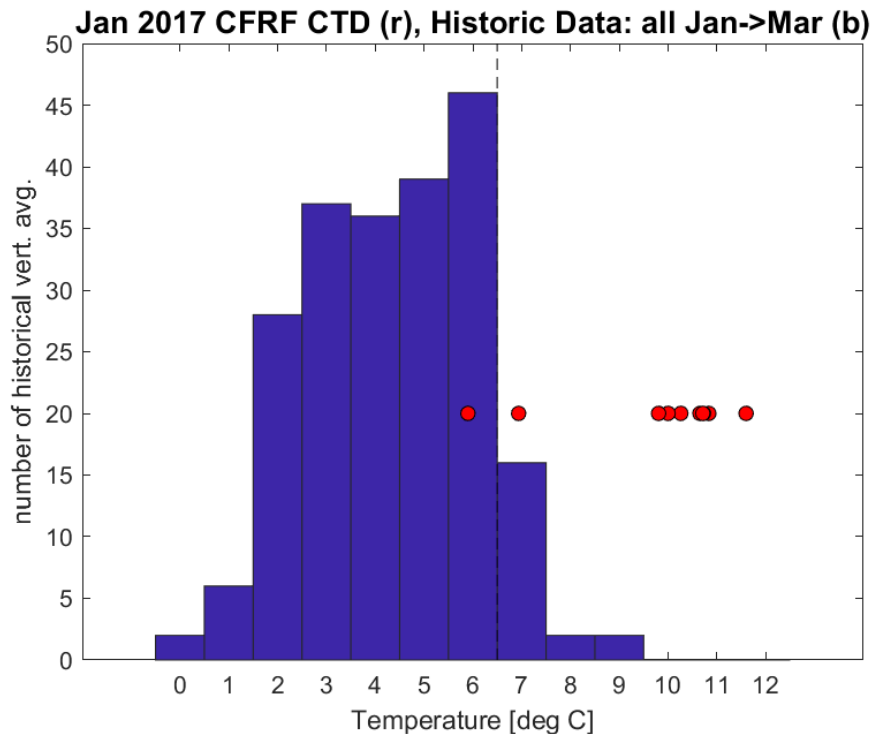


10°C surface temp.
100 km shoreward
of shelfbreak

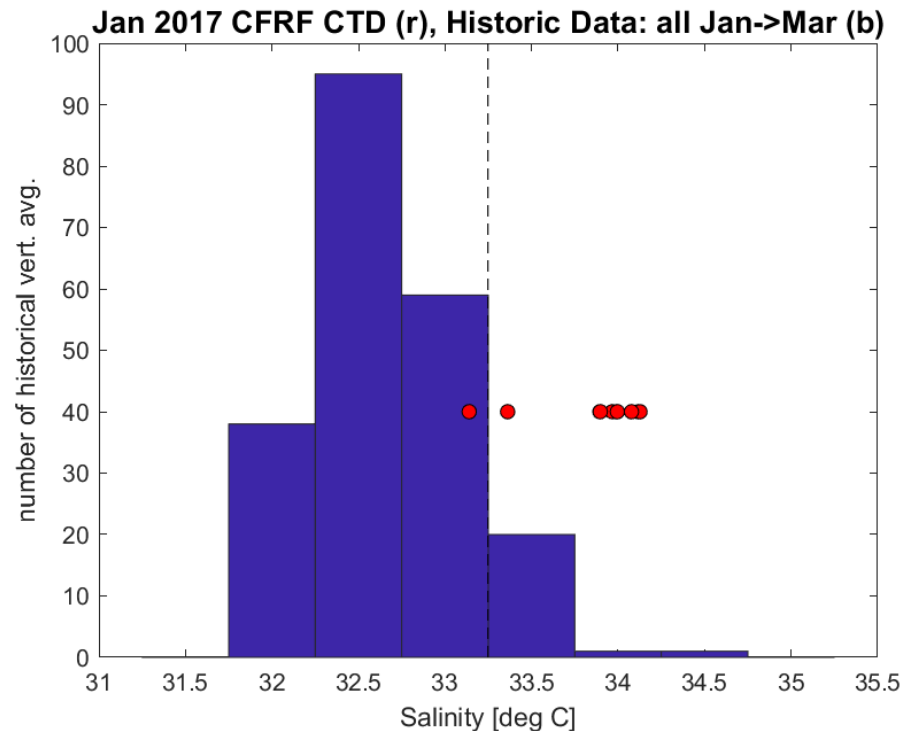
Temp. anomaly
>5°C

Salinity anomaly
>1.5 PSU

How unusual were T/S in January 2017?

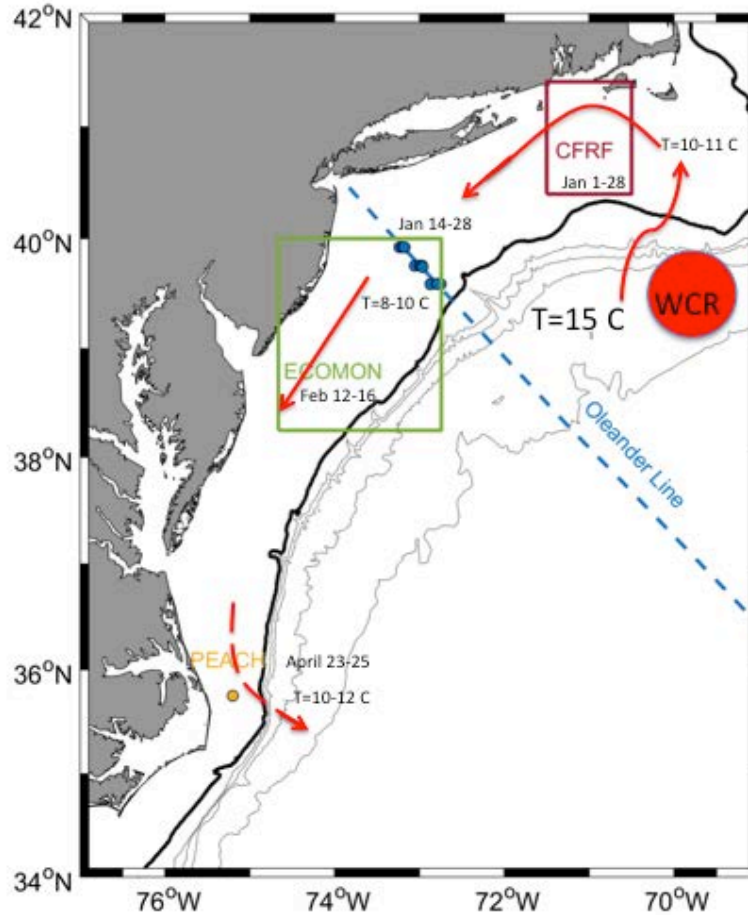


Histogram of historical temperature
Depth-averaged data prior to 2003
Red are shelf fleet data from 2017



Histogram of historical salinity
Depth-averaged data prior to 2003
Red are shelf fleet data from 2017

Tracking the Ring intrusion/ Heatwave along the Middle Atlantic Bight



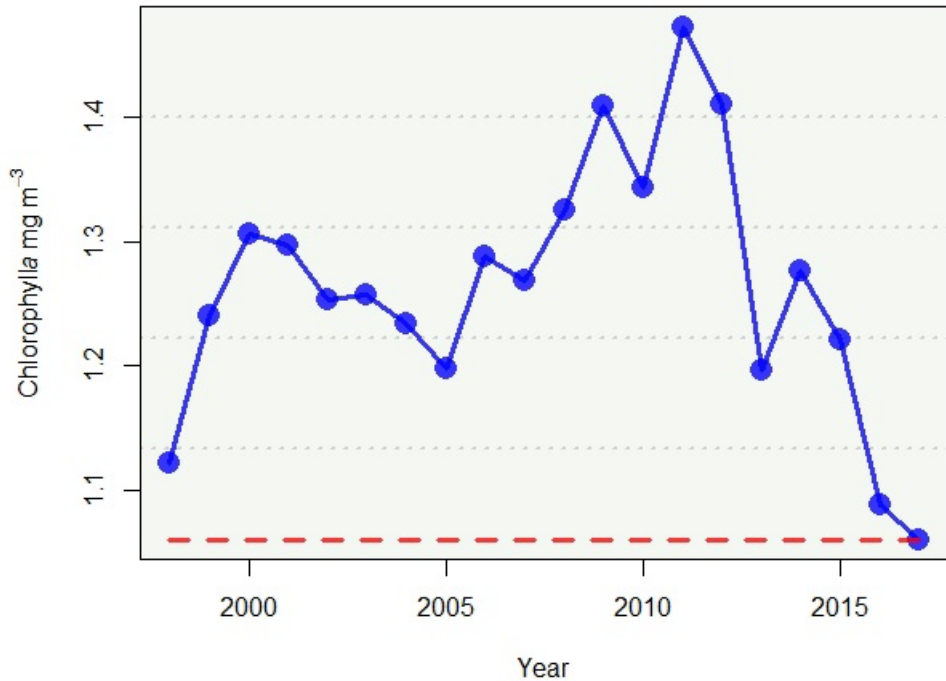
Duration- 123 days

Departed continental shelf
Near Cape Hatteras April 25

Advection rate of 8.7 cm/s
Consistent with historical
Estimates of alongshelf velocity

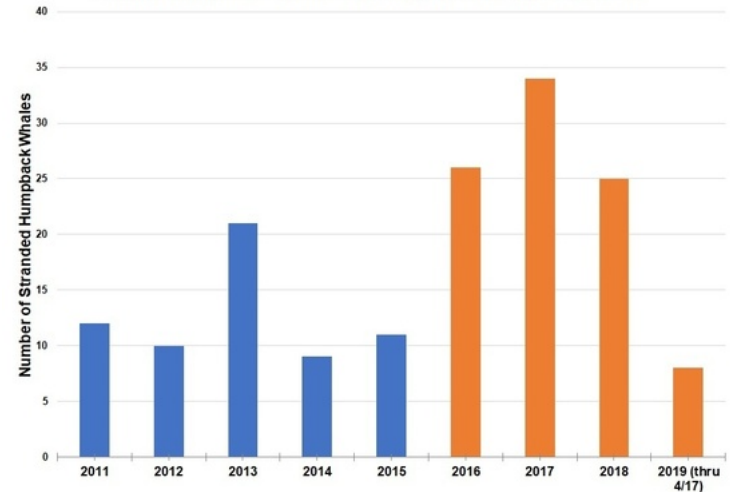
Ecological Consequences

Shelf Wide Chlorophyll a 1998-2017



Lowest value for entire 20 year span
Friedland, press release, NMFS

Annual Humpback Whale Strandings from Maine to Florida



Unusual mortality event for
Humpback Whales, 2017
NMFS website

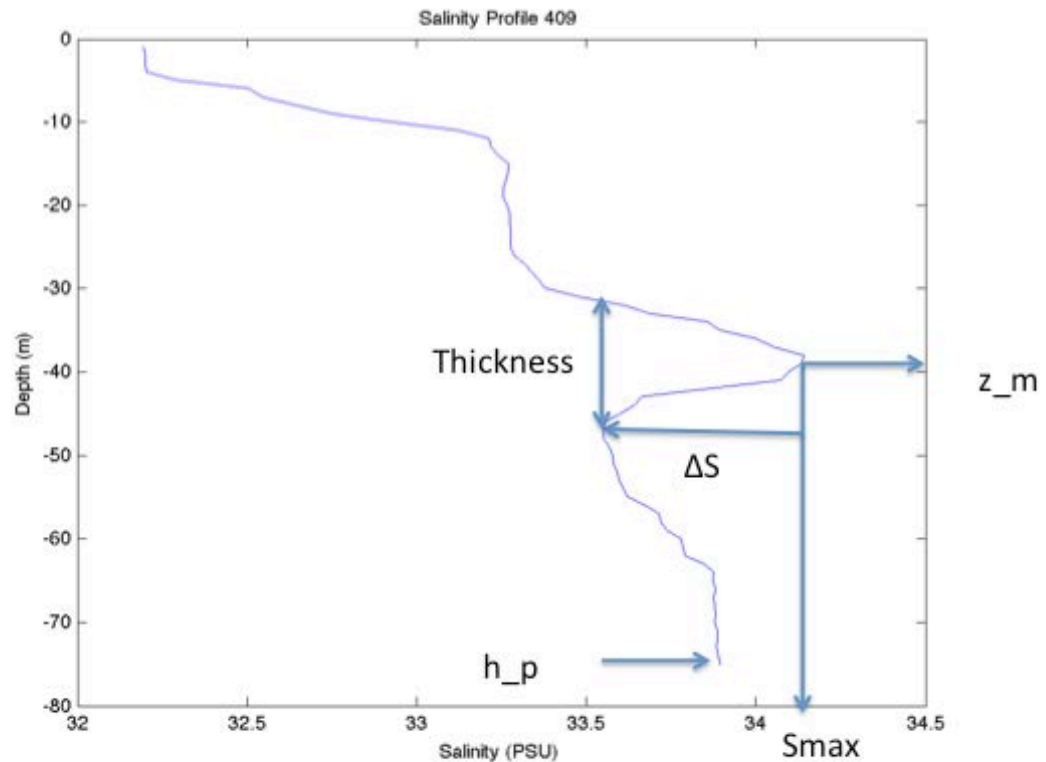
Changing Processes- The Salinity Maximum Intrusion

Example 1

Pycnocline Salinity Maximum
Gordon and Aikman, 1981
Aikman, 1984
Lentz, 2003

Commonly observed, but
Horizontal scales not well
Established

Intrusion characteristics
Defined by Lentz appear in
Shelf Fleet profile to right



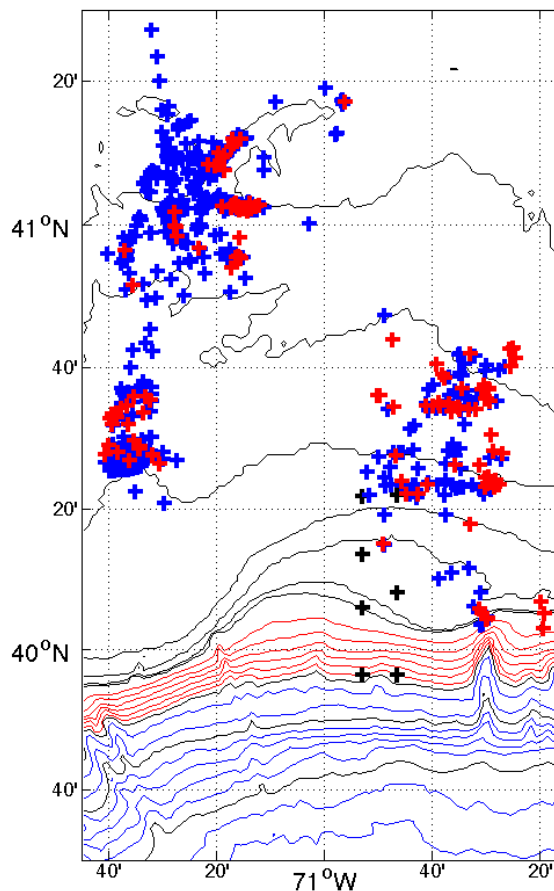
Location of Smax Intrusions 2015-2019

Examined 621 profiles for
2015-2019 from Shelf Fleet

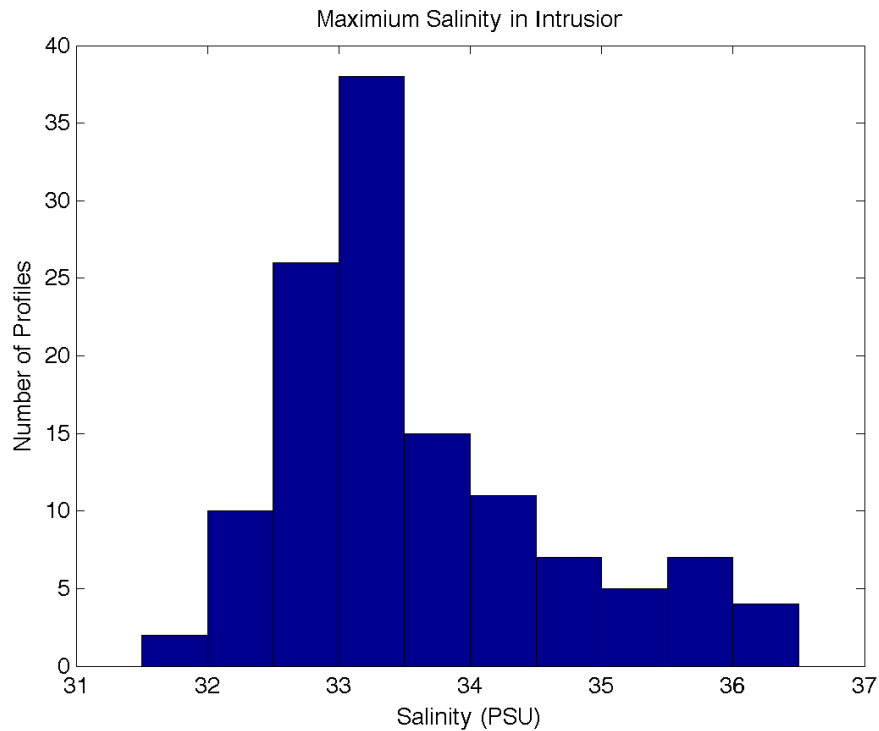
Used $\Delta S \geq 0.2$ PSU
(Lentz used 0.1 PSU)

Red crosses denote profiles with
Intrusions, blue crosses without
Intrusions

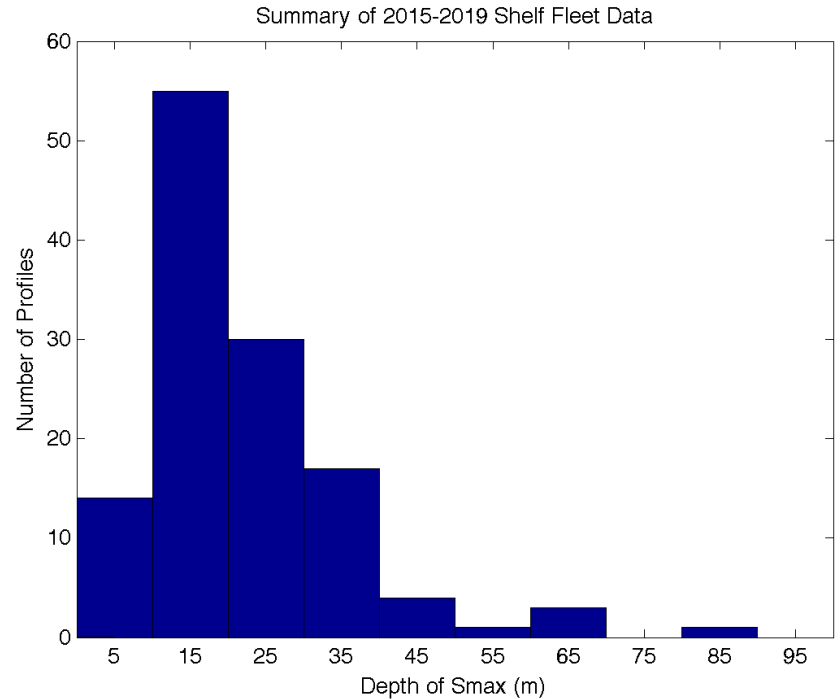
Intrusions are up to 100 km
Shoreward of Shelfbreak



Key Characteristics of Intrusions 2015-2019



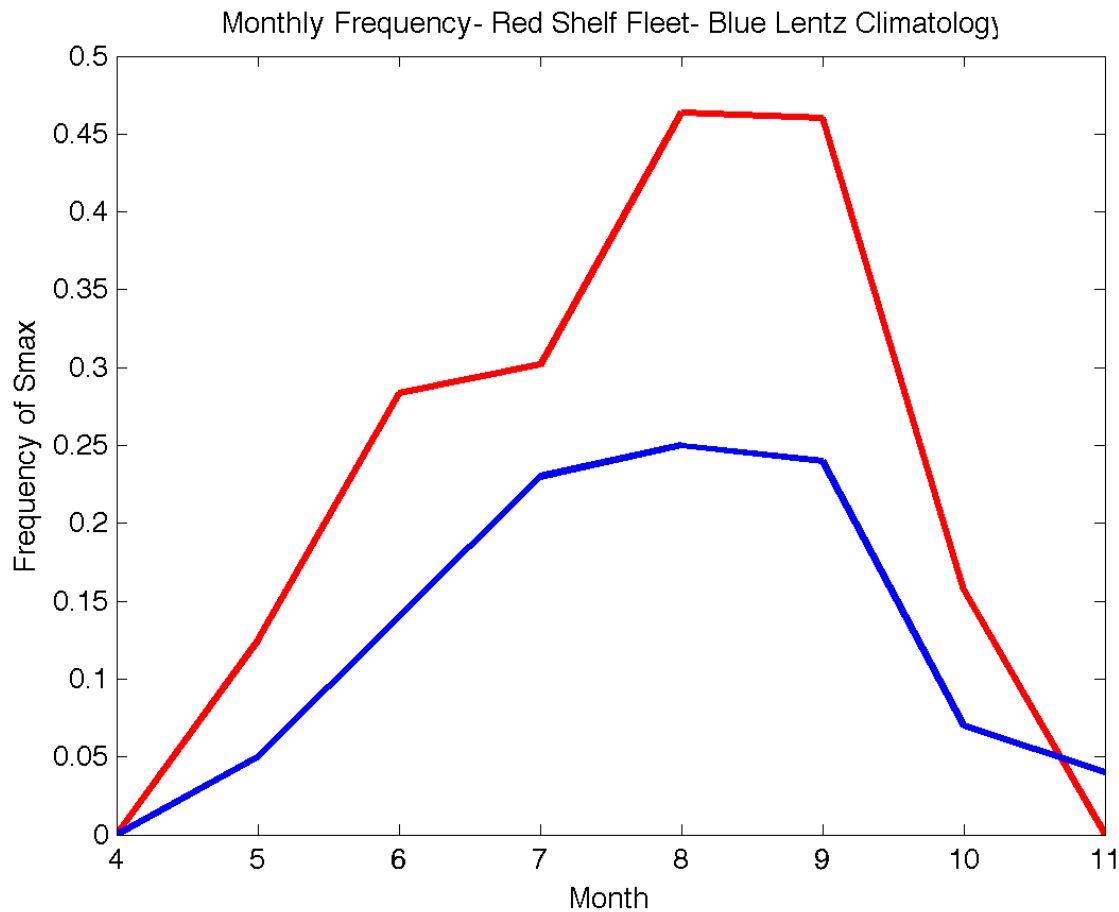
Histogram of Salinity Maximum
Mean 33.60 PSU



Histogram of Depth of Intrusion
Mean 22.04 m

Mean Thickness 15.65 m

Frequency of Intrusions compared to Lentz Climatology



Overall Frequency- Shelf Fleet 18% Lentz Climatology 11%
64% increase in frequency!!!

The Future

- van Beuren funding runs out 2021, will be writing NSF proposal to extend by 5 years
- Explore relation between intrusions and inter-annual variability of squid catch
- Examine other Marine Heatwaves in region (2016)
- Shelf Fleet protocol to be used in new CFRF project with Offshore Wind industry
- **BUY LOTS OF RBR INSTRUMENTATION!!!!**