

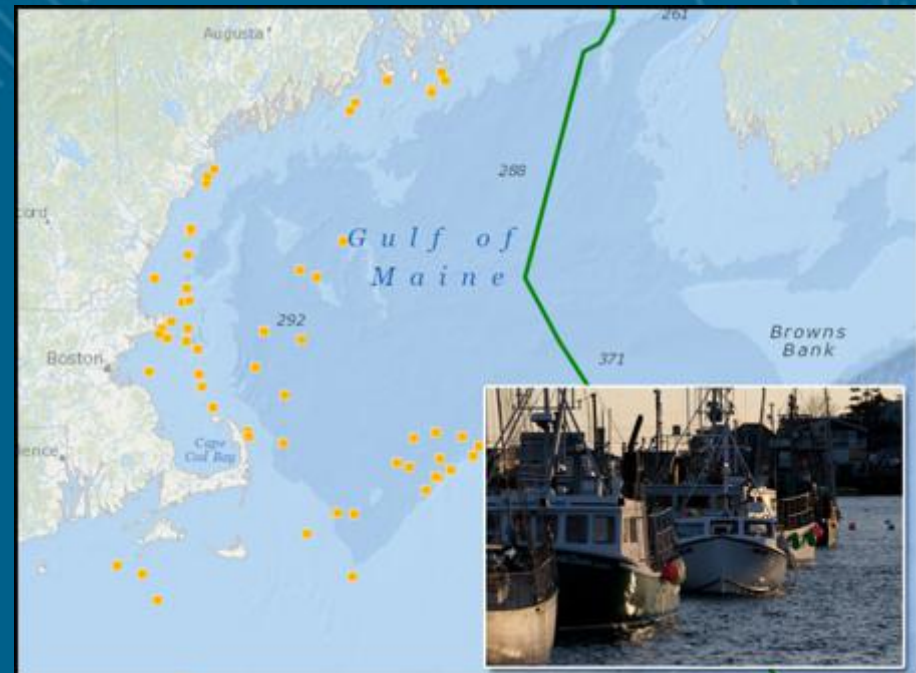


**Reducing Bycatch in New England's
Groundfish Sectors:
Development of a Fishing Area Selectivity Tool**

Jonathon Peros & Riley Young Morse
Fisheries Bycatch Global Issues and Creative Solutions
Wakefield Fisheries Symposium
May 15, 2014

Overview

- Background of Problem
- Identification of Solution
- The Process
- The Results
 - Challenges
 - Successes
 - Lessons Learned
- Next Steps



Background: Management Shift

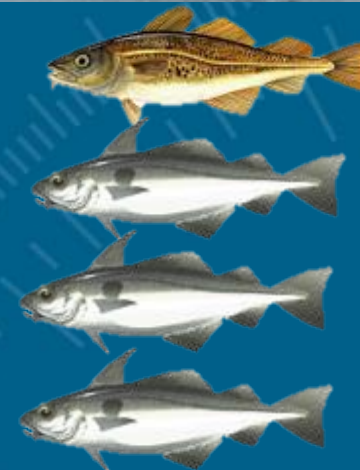
Allocation of days to fish



Allocation of fish



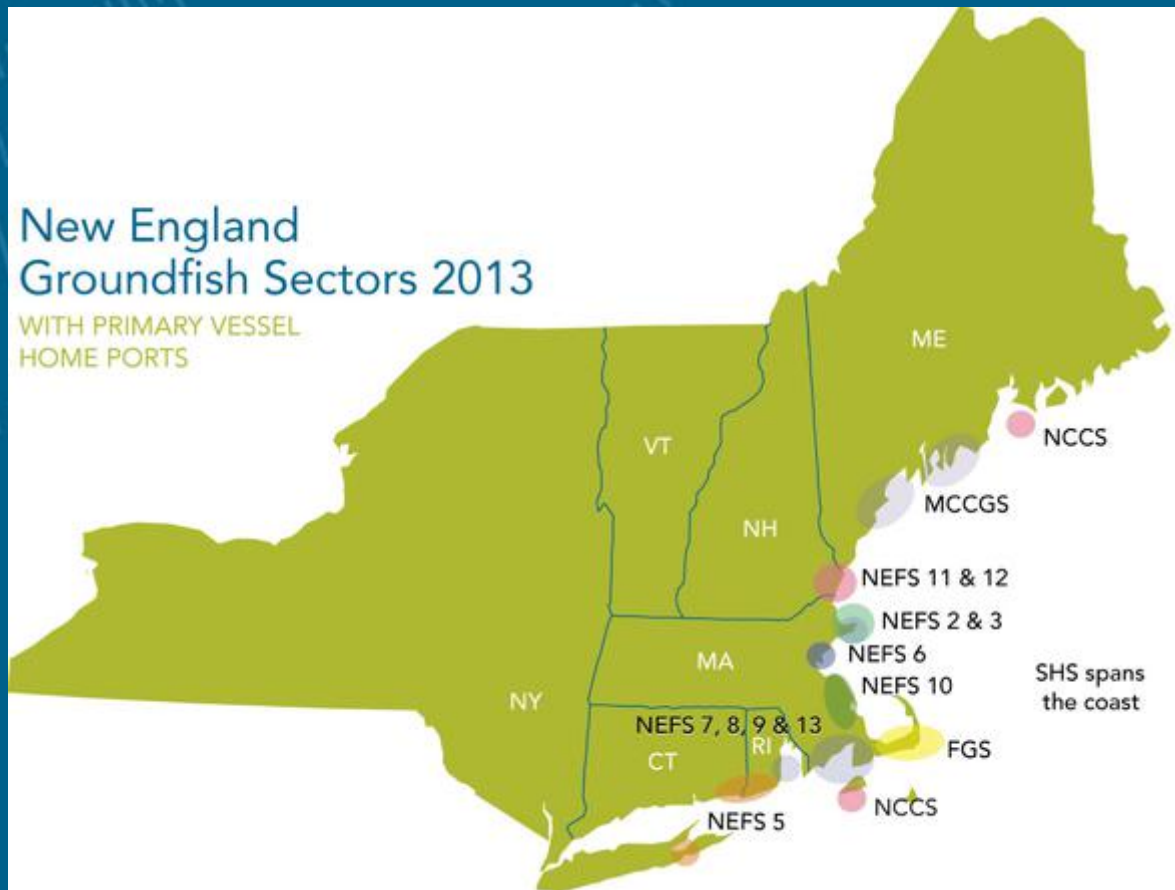
Days At Sea



Background: Sectors

New England Groundfish Sectors 2013

WITH PRIMARY VESSEL
HOME PORTS



- FGS GB Cod Fixed Gear Sector (MA)
- MCCGS Maine Coast Community Groundfish Sector (ME)
- NEFS2 Northeast Fishery Sector (MA)
- NEFS3 Northeast Fishery Sector (MA)
- NEFS5 Northeast Fishery Sector (CT, RI)
- NEFS6 Northeast Fishery Sector (MA)
- NEFS7 Northeast Fishery Sector (MA)
- NEFS8 Northeast Fishery Sector (MA)
- NEFS9 Northeast Fishery Sector (MA)
- NEFS10 Northeast Fishery Sector (MA)
- NEFS11 Northeast Fishery Sector (NH)
- NEFS12 Northeast Fishery Sector (NH)
- NEFS13 Northeast Fishery Sector (MA)
- NCCS Northeast Coastal Communities Sector (MA, ME)
- SHS1 Sustainable Harvest Sector (MA, ME, NH, RI)

LEASE ONLY SECTORS*

- NEFS4 Northeast Fishery Sector (MA)
- MEPB Maine Permit Bank (ME)
- SHS3 Sustainable Harvest Sector 3

* Not displayed on map

Project Assumptions

- Data Poor
 - Limited access to data, fishermen can only see their own information, takes a while to get into system
- Follow “Big Data” Paradigm
 - Share catch data regionally aggregated and integrated with data could provide insight into trends and patterns that could help avoid bycatch
- Goal: sectors fish to full quota

Proposed Solution

Develop industry led **bycatch avoidance tool** that would map **hotspots** of **choke** species

Encourage/enable the fleet to share data, and target their full allocation

Leveraging success stories

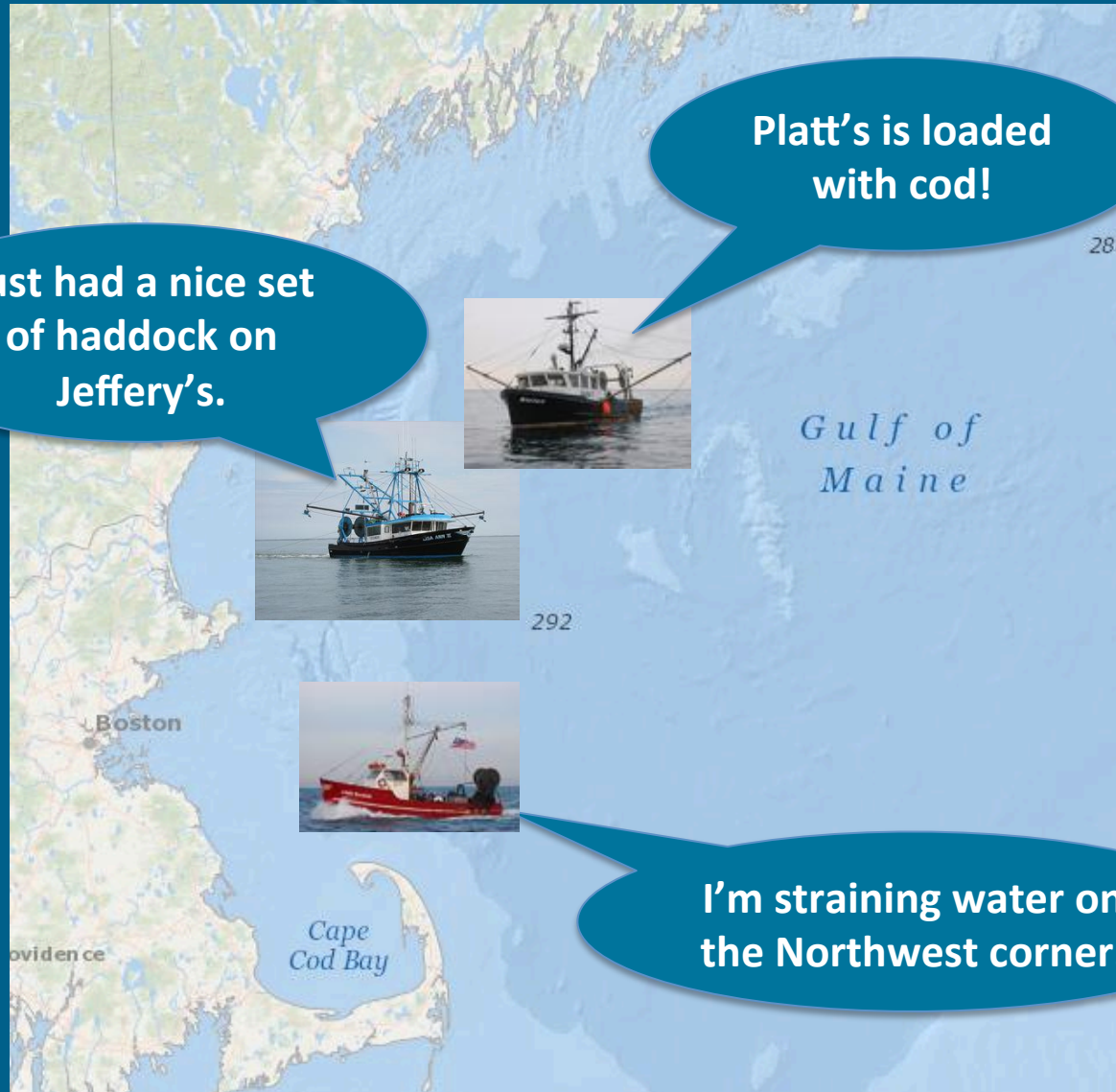
- Others dealing with choke species that can shut down fishery:
 - SeaState –Walleye pollock fishery/Alaskan salmon bycatch
 - SMAST Georges Bank scallop fishery/yellowtail Flounder

Sector fishermen should work together, right?

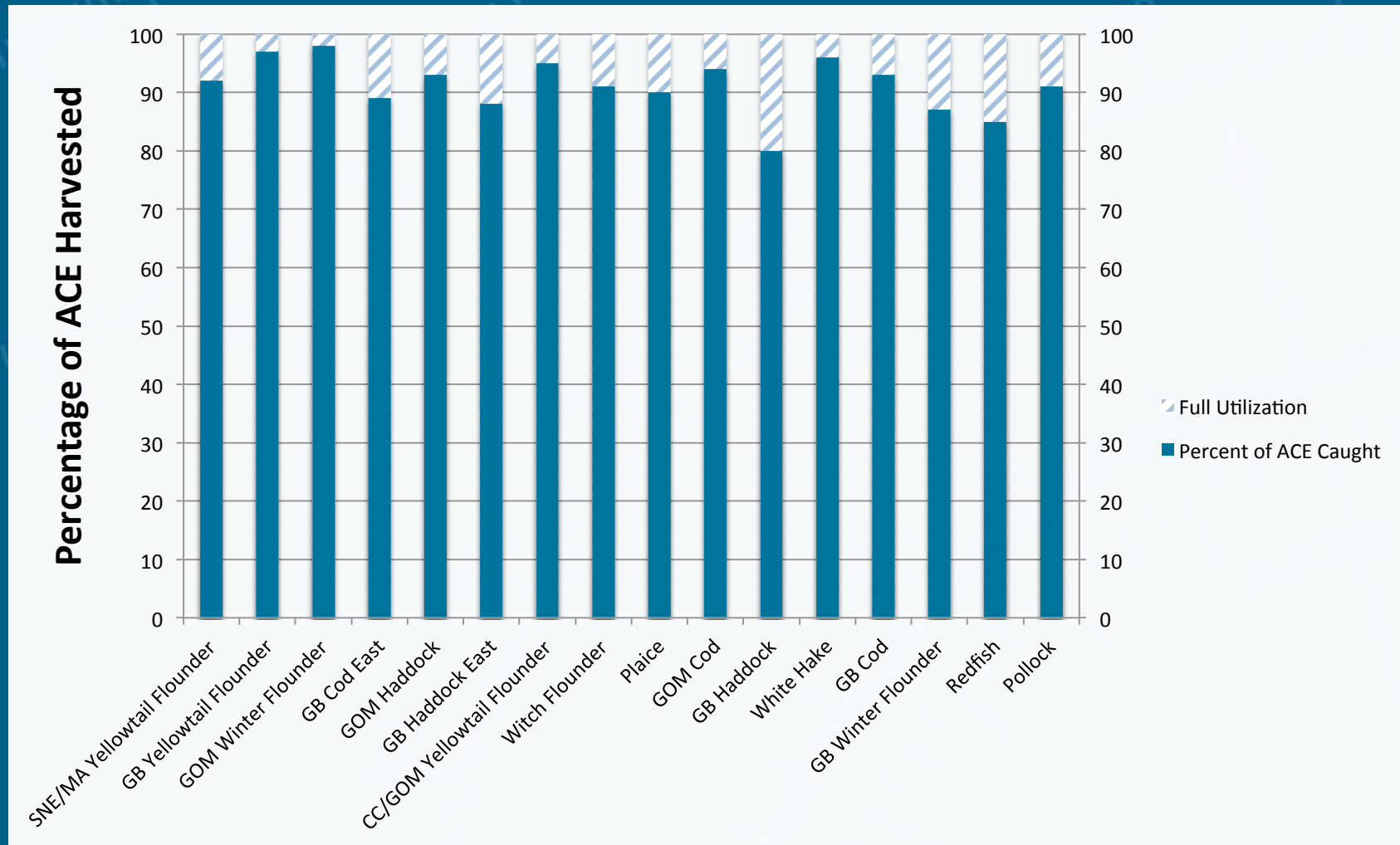
Just had a nice set
of haddock on
Jeffery's.

Platt's is loaded
with cod!

I'm straining water on
the Northwest corner.



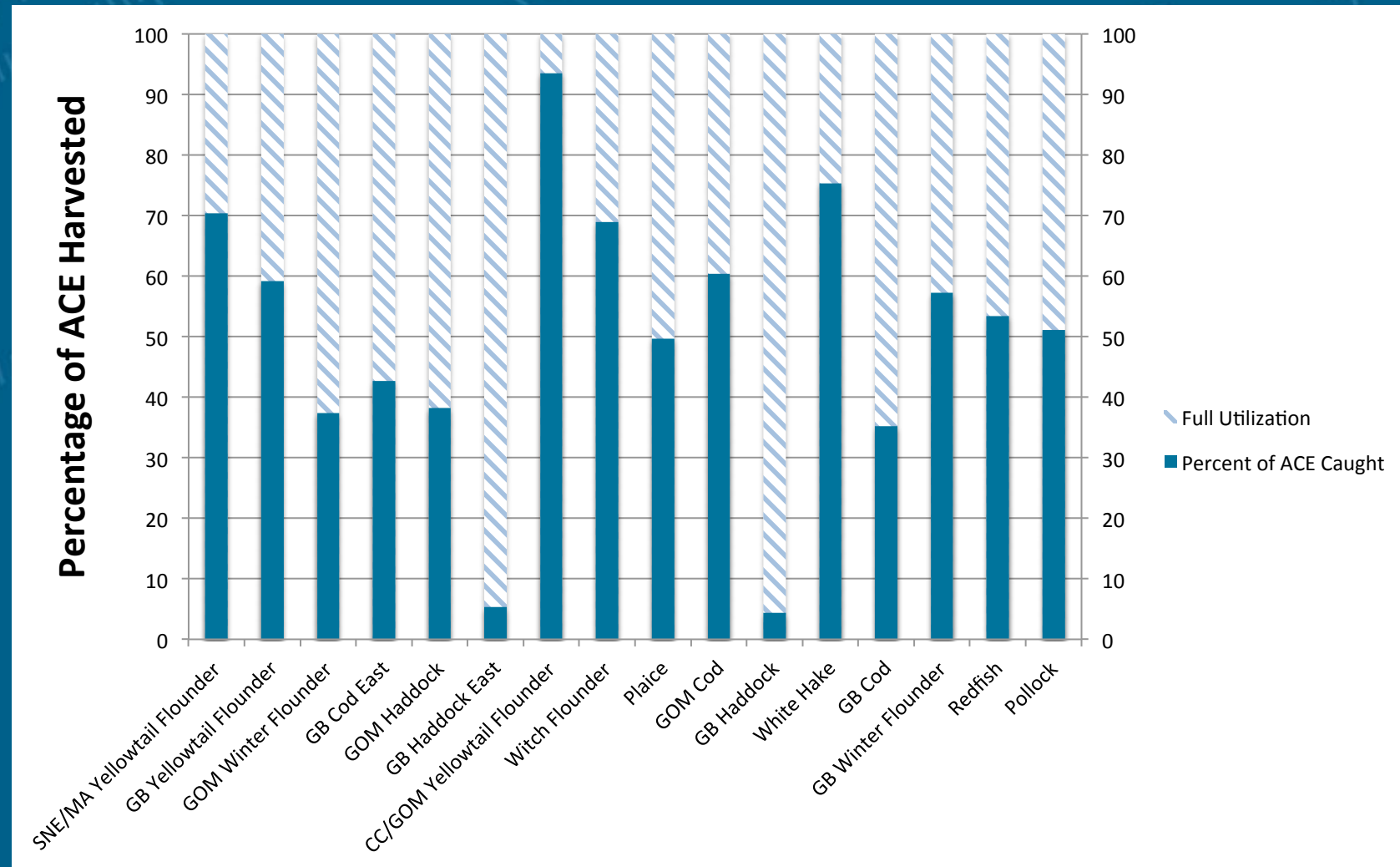
Full Harvest of Sector Allocations



Reality Bites

- Perceived Problem:
 - Under low annual catch limits (ACLs), there would be Choke stocks
 - Low allocations of one species would constrain the industry's ability to harvest other species.
- Challenges to our assumptions
 - No “choke” stocks
 - Fluid lease market
 - One person's choke stock is another's target
 - Fishermen are not interested in sharing catch data for target species
 - Fishing locations are private information

2012 Groundfish Harvest



Confidentiality

...few flats here
and there...

...marked a few fish...see
what comes up in the
bag...



292



.....

Course Correction

- Engage sectors
 - networked project: 400+/- individual businesses
- Can we find common problem?
 - changes depending on who is in the room
- What are the emerging issues in the nascent Sector program?

February 10, 2013

Maine Voices: 'Overfishing' or 'mismanagement'?

Groundfishermen are taking the blame for the fishery crisis, while those who create policy are exempt from scrutiny.

fishery to access other species in a closed area

January 1, 2012

No easy answers to New England cod crisis

Cod fishery's catch limit cut by 77%, 'the game is over'

A fishing way of life is threatened

By David Ariosto, CNN

updated 10:37 PM EST, Tue February 28, 2012

Cod crisis prevented this from moving forward.

February 25, 2014

NOAA sees 'status quo' on closed fish areas

By Sean Horgan
Staff Writer

FAST Tool, take 2: Harbor Porpoise



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[Home](#) | [News](#) | [Management & Regulation](#) | Porpoise problems have fishermen facing shutdown

Porpoise problems have fishermen facing shutdown

problem” John Corwin

September 12, 2012 11:05PM

NH fishermen say new rule sounds death knell for industry

By GRETYL MACALASTER
Union Leader Correspondent



Feds turn down request for porpoise closure relief

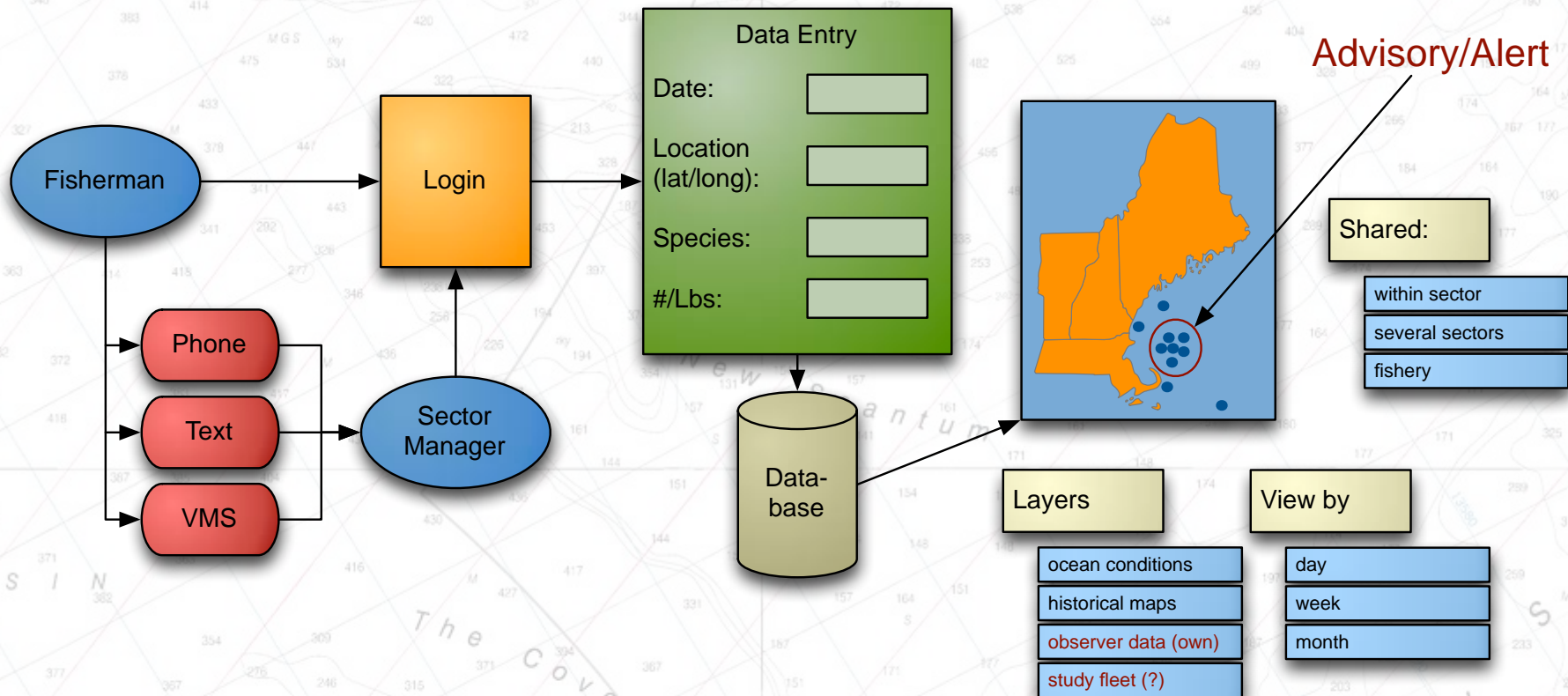
Harbor Porpoise Consequence Closure in the Gulf of Maine



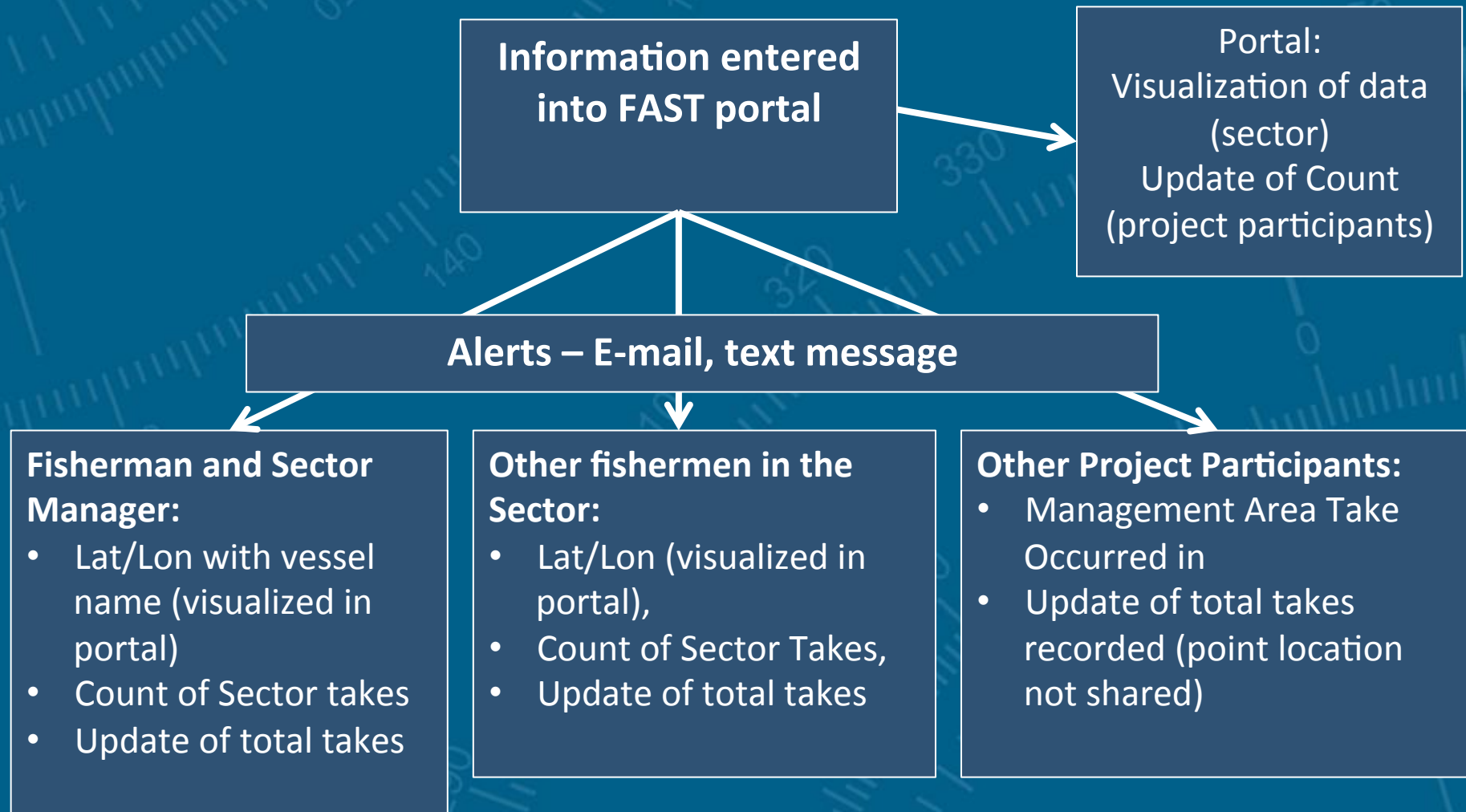
Industry was willing to admit they had a problem

- Industry only seeing aggregate take data after the fishing season had ended – no way to proactively address a FLEET WIDE issue.
 - Could we share take information across the fleet during the fishing year, modify fishing behavior in season to minimize takes?
- Industry led process with goal of reducing takes in sink gillnet fishery.
 - Marine mammal focus – legal mandate to report interactions (MMPA)
 - Fixed gear fishery in small communities – No secrets about where and when fishermen fish.
 - Allocations and catch info is not shared

Web-based Reporting and Mapping Species of Interest/Hot Spots in Near Real-time for Groundfish Sectors



Industry Designed Data Sharing



FAST: Web-Based Portal

Layers: Historic harbor porpoise take data

FAST Fishing Area Selectivity Tool

FAST MAP | REPORT SPECIES ENCOUNTER | PROJECT NEWS

Home

FAST MAP

Collapse

Base Map

ESRI Ocean Base...

Monitoring Locations Filter

Refresh Map

All Months

Closed Areas

Hague Line

Geospatial Data Layers

Northeast LOS...

Statistical Area...

HPTRP Stelwa...

HPTRP Mass B...

Legend

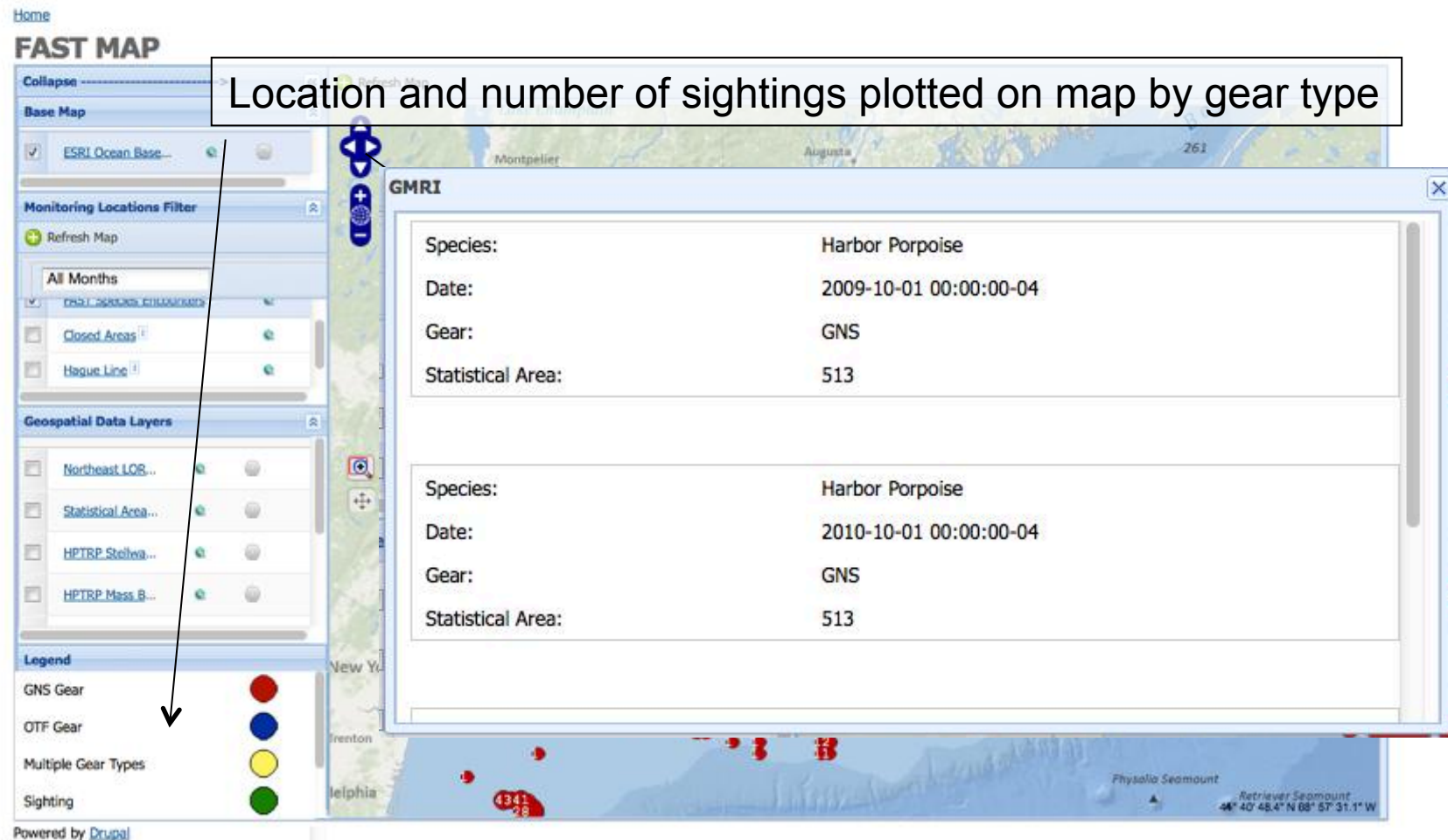
- GNS Gear
- OTF Gear
- Multiple Gear Types
- Sighting

Location and number of sightings plotted on map by gear type

GMRI

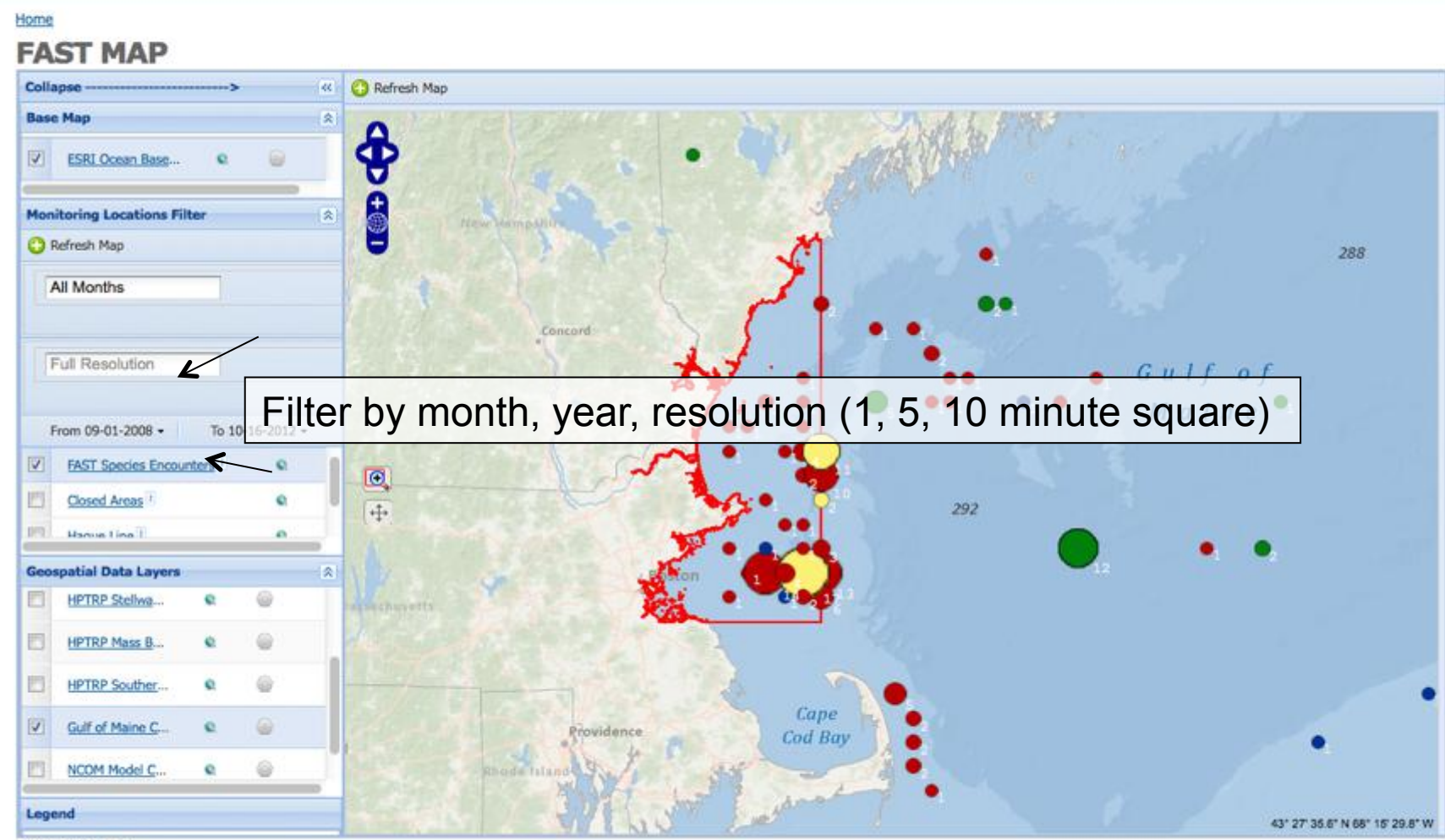
Species:	Harbor Porpoise
Date:	2009-10-01 00:00:00-04
Gear:	GNS
Statistical Area:	513
Species:	Harbor Porpoise
Date:	2010-10-01 00:00:00-04
Gear:	GNS
Statistical Area:	513

Powered by Drupal



Layers: Consequence closure area

FAST Fishing Area Selectivity Tool



The screenshot displays the FAST MAP web application interface. On the left side, there is a sidebar with several sections: 'Collapse', 'Base Map' (with 'ESRI Ocean Base...' selected), 'Monitoring Locations Filter' (with 'All Months' selected), 'Full Resolution' (indicated by an arrow), 'From 09-01-2008' to 'To 10-10-2012' date range, 'FAST Species Encounters' (checked, indicated by an arrow), 'Closed Areas', and 'Map Scale'. Below these are 'Geospatial Data Layers' including 'HPTRP Stellwa...', 'HPTRP Mass B...', 'HPTRP Souther...', 'Gulf of Maine C...' (checked), and 'NCOM Model C...'. A 'Legend' section is at the bottom of the sidebar. The main map area shows a satellite-style map of the Gulf of Maine region, with a red boundary indicating a consequence closure area. Various colored dots (red, green, yellow) are scattered across the map, representing species encounters. A text box with a white background and black border is overlaid on the map, containing the text 'Filter by month, year, resolution (1, 5, 10 minute square)'. The map includes geographical labels like 'New Hampshire', 'Concord', 'Cape Cod Bay', and 'Providence'. Coordinates '43° 27' 35.6" N 68° 15' 29.8" W' are shown in the bottom right corner. The text 'Powered by Drupal' is visible at the bottom left of the map area.

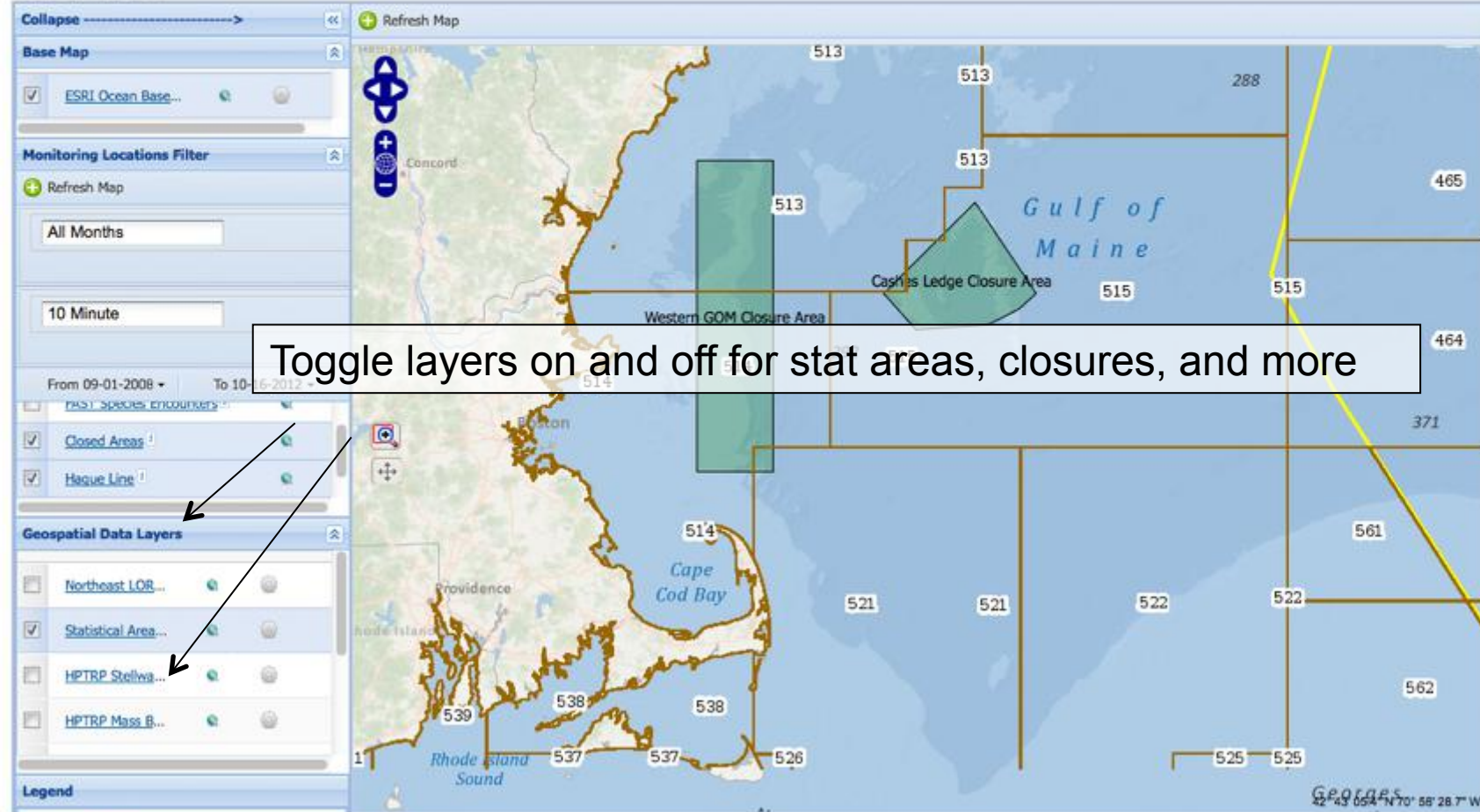
Layers: Statistical area, closures, Hague Line

FAST Fishing Area Selectivity Tool

FAST MAP | REPORT SPECIES ENCOUNTER | PROJECT NEWS

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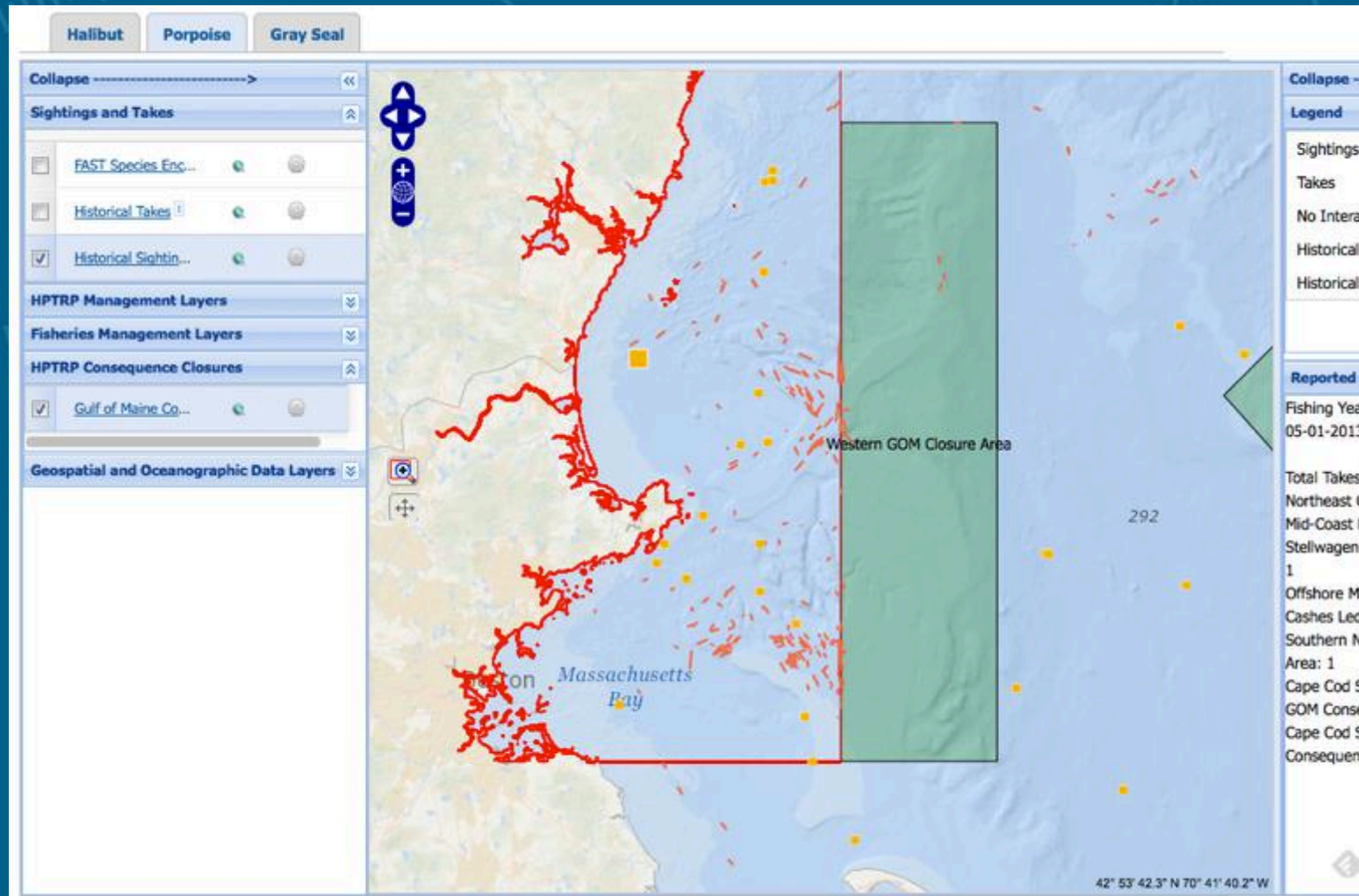
FAST MAP



The screenshot displays the FAST MAP interface. On the left, there is a sidebar with several sections: 'Base Map' (with 'ESRI Ocean Base...' selected), 'Monitoring Locations Filter' (with 'All Months' and '10 Minute' filters), 'Geospatial Data Layers' (with 'Statistical Area...' checked), and 'Legend'. The main map area shows the Gulf of Maine with various boundaries and labels, including 'Cashes Ledge Closure Area', 'Western GOM Closure Area', and 'Hague Line'. A text box with the text 'Toggle layers on and off for stat areas, closures, and more' is overlaid on the map, with arrows pointing to the 'Geospatial Data Layers' section in the sidebar.

Toggle layers on and off for stat areas, closures, and more

Historical observer data



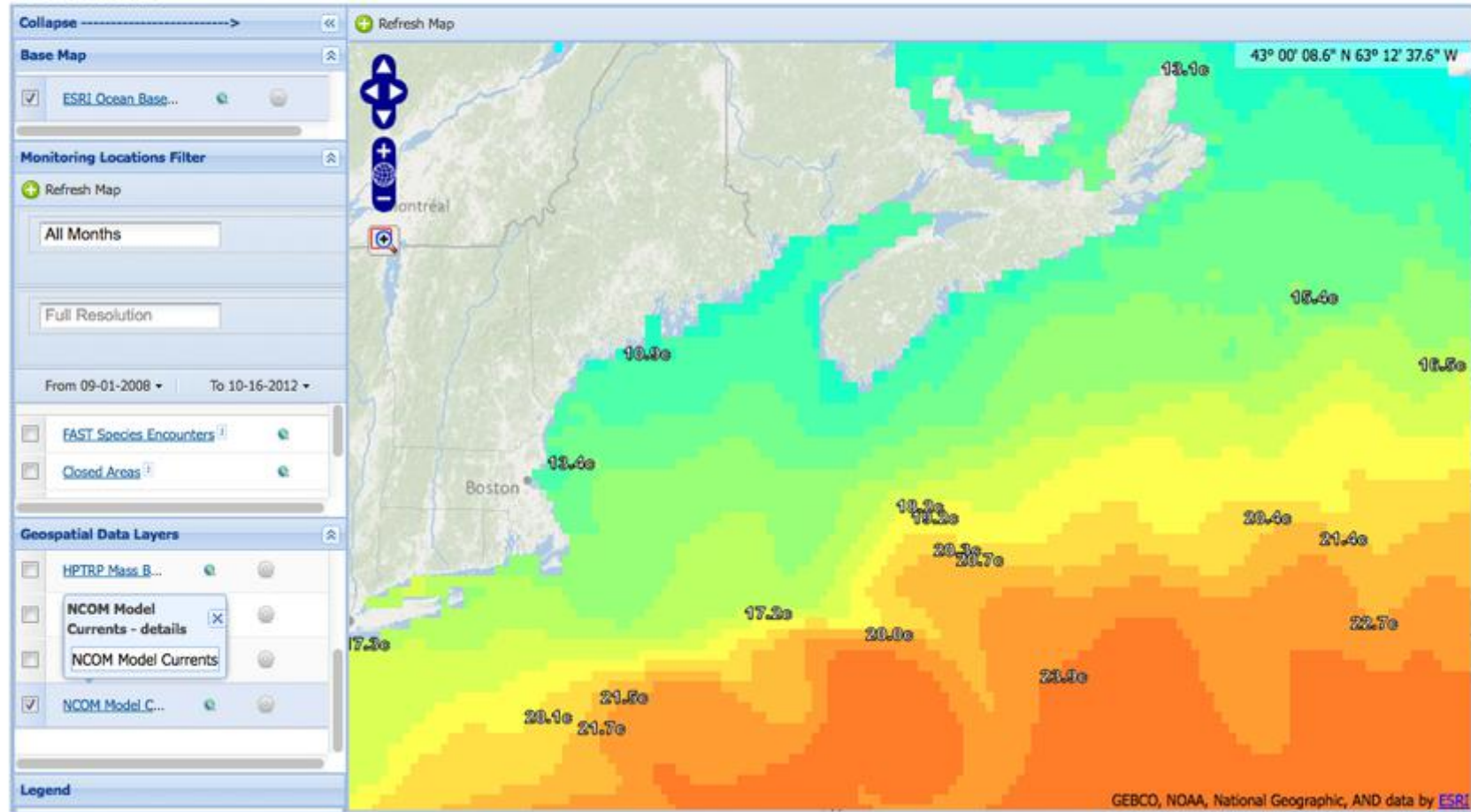
Oceanography: Water Temp

FAST Fishing Area Selectivity Tool

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FAST MAP



Powered by [Drupal](#)

GEBCO, NOAA, National Geographic, AND data by [ESRI](#)

Reporting interactions

FAST Fishing Area Selectivity Tool

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REPORT SPECIES ENCOUNTER

Fast Species Encounter

Species: What species?

Encounter Type: What kind of encounter?

Number of sightings: How many of this species sighted?

Latitude: Latitude

Longitude: Longitude

Encounter Date:

E.g., 2012-10-16 E.g., 14:45:45

SAVE 

Powered by [Drupal](#)

Data Sharing - Alerts

FAST Species Encounter Report – Inbox

Message

Delete Reply Reply All Forward Move Rules Junk Unread Categorize Follow Up

FAST Species Encounter Report
 iogilvie@gmri.org
 Sent: Tuesday, November 27, 2012 4:31 PM
 To: Jonathon Peros

jperos, A sighting of has been reported.

Species:	Harbor Porpoise
Date:	2012-11-27 16:30:00-05
Sector:	Maine Permit Bank Sector
Sightings this encounter:	1
Total Sightings for Maine Permit Bank Sector	1
Lat:	42 18 00.0
Lon:	-70 24 00.0

The moon was 14.1 days old, and waxing

Communication

- Many challenges in reporting real or near-real time information at sea
- Web-based tool that can be used anywhere there is internet access
- Reporting can even be done on smart phones over 3G network



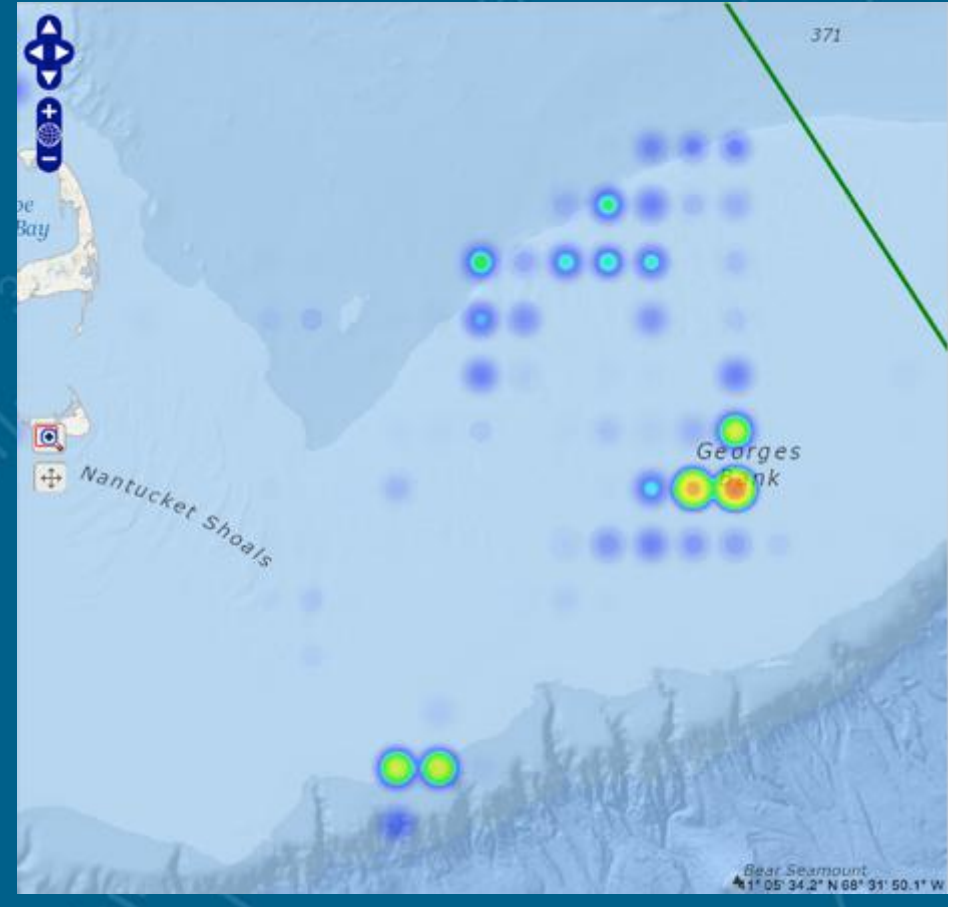
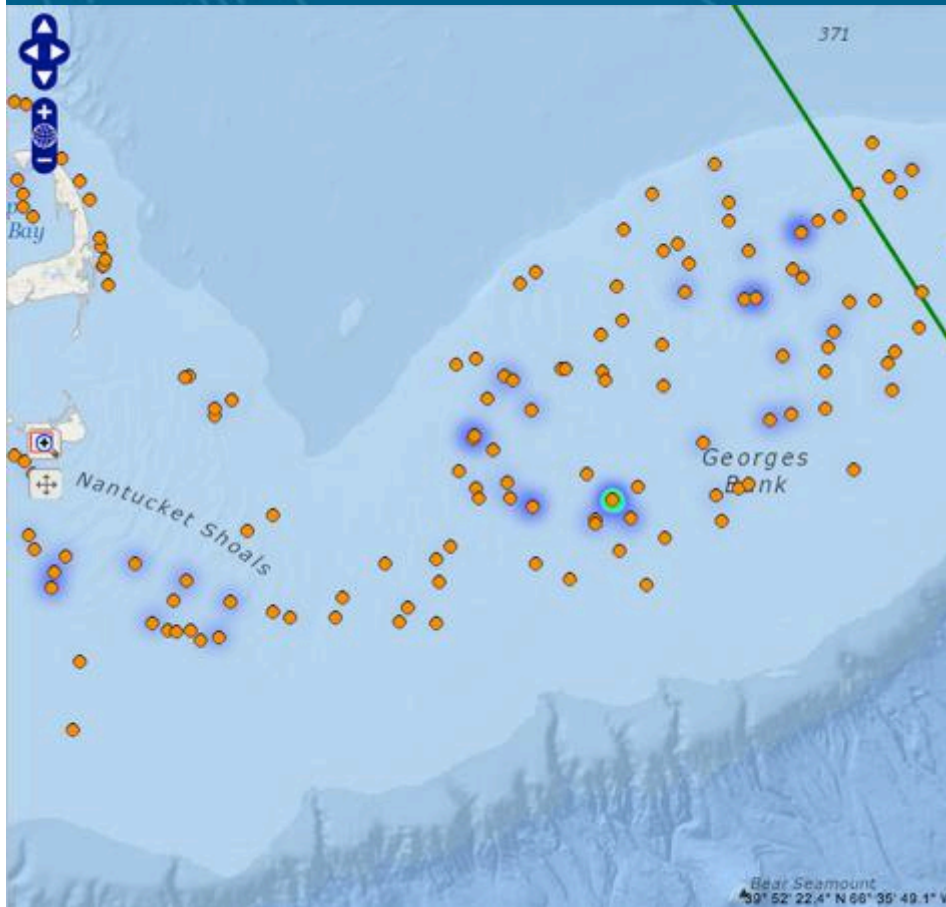
FAST: Enabling an Industry Led Process

- FAST is a *tool* that can be used in an industry led process *outside of the regulatory process (voluntary)*
- Aligning oceanographic and modeling information with historic and near real-time data through a web-based portal
- Information sharing arrangement designed by industry
 - Alert system
- Industry designed protocols in response to near real-time information
 - Voluntary response to information

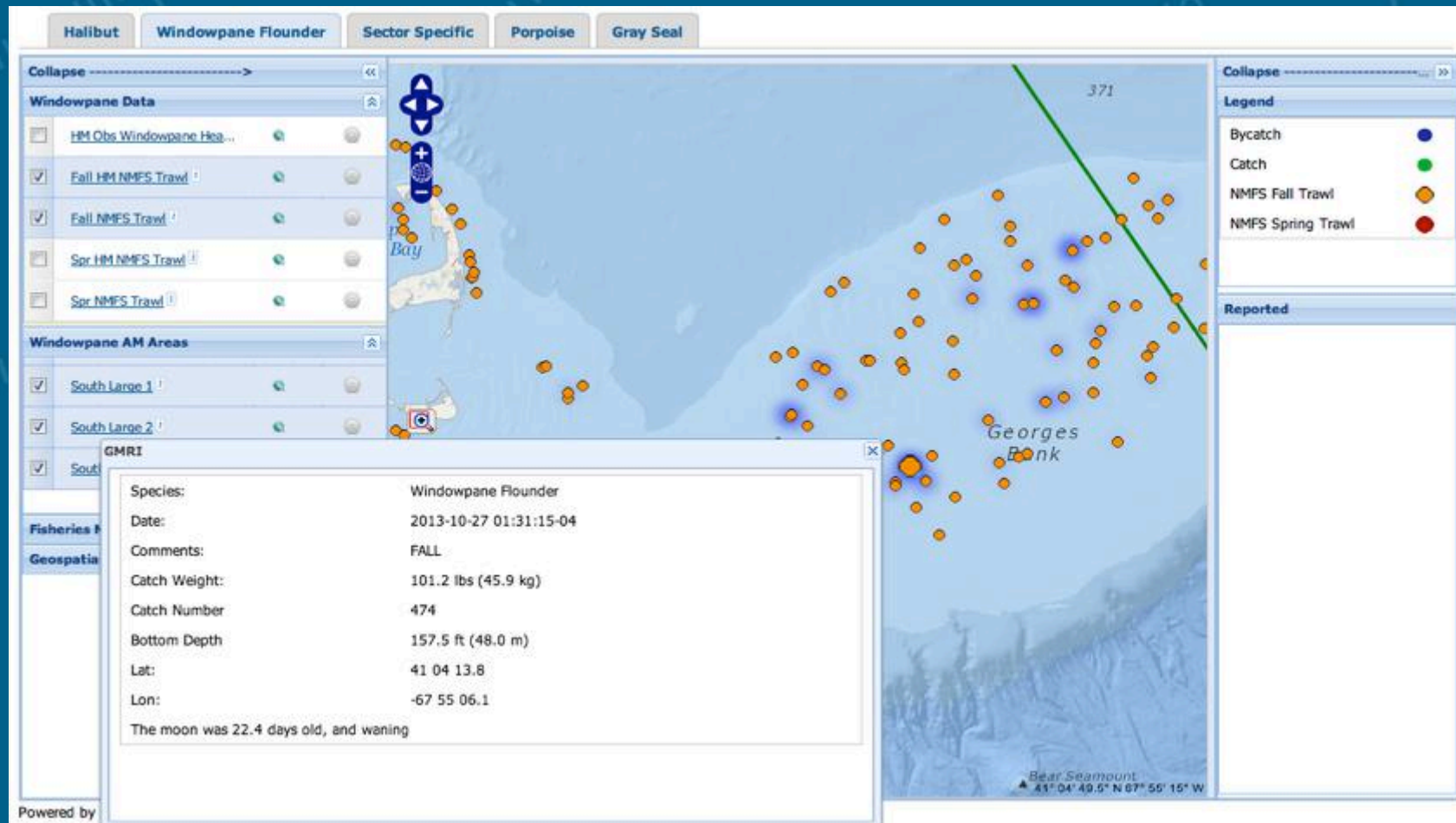
Extending Project Focus

MAGNETIC

Fall Trawl Survey vs. Observer



Hot Spots



Sector data

FAST Fishing Area Selectivity Tool

FAST MAP | REPORT SPECIES ENCOUNTER | PROJECT OVERVIEW | RESOURCES

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Fast Species Encounter

Upload Data: No file chosen Data file (.csv)

You may upload your halibut data as a .csv file. Please make sure your data is stored as .csv and that your headers matches the headers shown the example below:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Vessel Name	Gear Code	Mesh Size	Mesh Category	Area	Date Landed	Quantity # Kept	Quantity # Discard	DEPTH	LAT_DEGR EE	LAT_MIN UTE	LAT_SECO ND	LONG_DEGR REE	LONG_MIN UTE	LONG_SEC OND	LORANK1	LORANK2
2	GNS	F	1M	SSA	S1A	8-Jul-13	0	20	50	43	77	43	69	43			
3	GNS	F	1M	ELM	S1B	9-Jun-13	31	0	50	43	19	43	69	43	112	13275	01730
4	GNS	F	1M	ELM	S1B	26-Jun-13	25	0	50	43	19	43	69	43	112	13275	01730

To upload your data, select "Choose File" button above, browse to the appropriate .csv file and click "Upload Data File".

If your file is processed correctly, the data will be automatically added to the database and will be available to view on the FAST map.

Halibut Windowpane Flounder **Sector Specific** Porpoise Gray Seal

Collapse ----->>> <<<

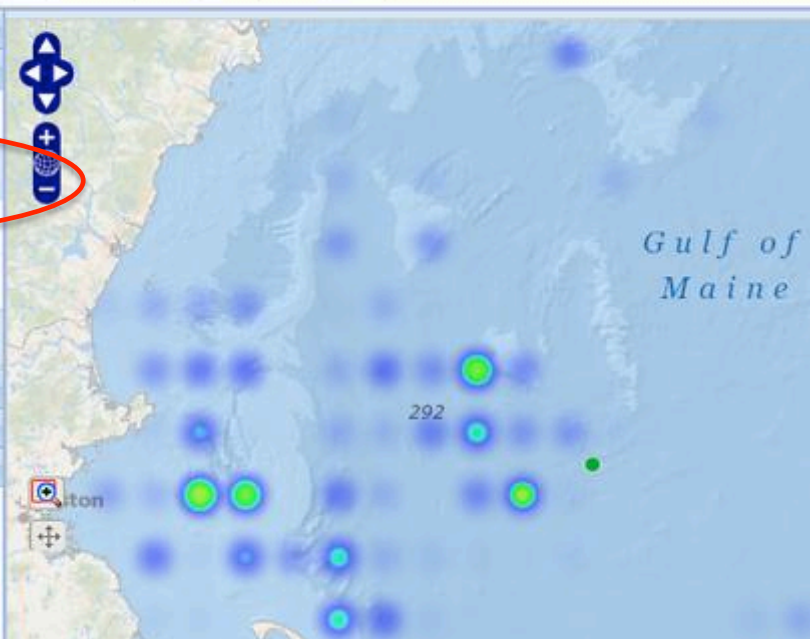
Catch & Bycatch

- Observer Halibut
- Uploaded Halibut**
- HM Kent Uploaded Halibut
- HM Discarded Uploaded H...
- HM Obs Halibut Heatmap

Windowpane AM Areas

Fisheries Management Layers

Geospatial and Oceanographic Data Layers



Gulf of Maine

292

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Challenges

- Sectors were very new
 - lots of concern about new system
 - little capacity to get engaged
 - problems had not materialized yet
- When crisis and threat is off the table, interest wanes
- RT or even near-RT data access is really challenging
 - technologically feasible, hurdles around access b/c of confidentiality, release of data, etc.

Successes

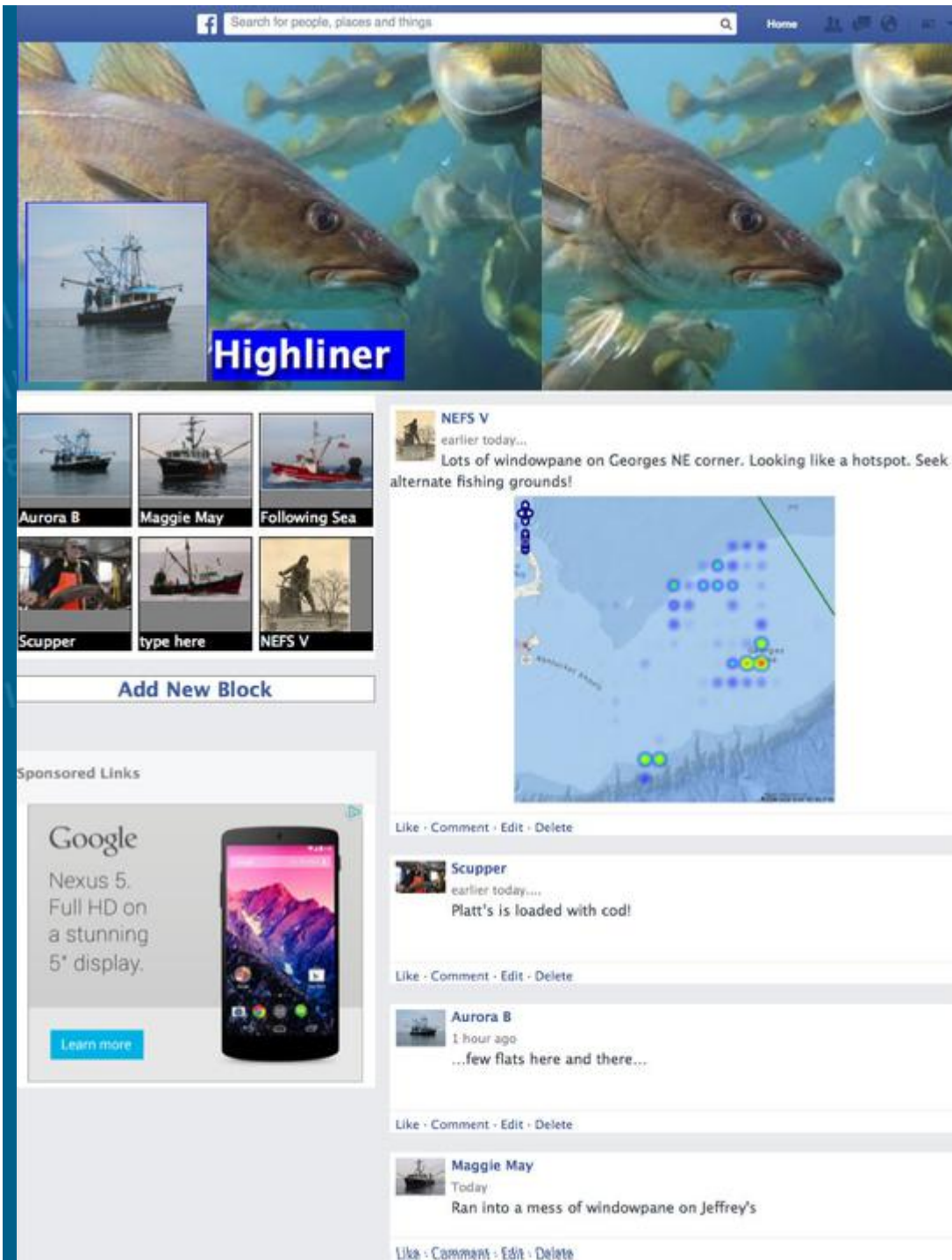
- Developed robust tool that doesn't really care what species is being monitored
- Flexible design, easy to extend to respond to new issues in fishery
- It's GIS – mapping platform to distribute data from other sources (NEFMC) that would be of interest/value to users

Lessons Learned

- What is the secret sauce?
 - **Trust** – prove that data stewarded and protected, sharing levels are set and understood by all participants
 - **Value** – show that program is actually helping reduce bycatch and avoid management actions
 - **Ease of use** – lower barrier to participation, no redundancy in reporting info (VTR integration)

Next Steps

- Non-allocated species – windowpane
 - Accountability measures for non-marketable species (windowpane) have been triggered – gear modifications required, potential for time area closures. Fleet could address this proactively during the fishing year, not be subject to time lags in management. Paying for catches that happened 2 years ago.
- Heatmap/hot spot for low resolution data
- Integrate eVTR data to reduce redundancy and give fishermen/sectors a way to visualize data geospatially/temporally
- Harness engaged group of sectors who have seen the value through the pilot and want to continue to grow program.



Facebook interface showing a fishing community page. The top navigation bar includes a search bar and navigation icons. The main content area features a large image of a fish with a "Highliner" label and a smaller image of a fishing boat. Below this is a grid of six smaller images labeled "Aurora B", "Maggie May", "Following Sea", "Scupper", "type here", and "NEFS V". A "Add New Block" button is visible. The "Sponsored Links" section displays a Google Nexus 5 advertisement. The main feed contains several posts from fishing-related entities:

- NEFS V** (earlier today...): Lots of windowpane on Georges NE corner. Looking like a hotspot. Seek alternate fishing grounds! (Includes a map showing fishing locations with blue and green markers.)
- Scupper** (earlier today...): Platt's is loaded with cod!
- Aurora B** (1 hour ago): ...few flats here and there...
- Maggie May** (Today): Ran into a mess of windowpane on Jeffrey's

We know we can
communicate in real
time with each other

If the service provided is
valuable, easy, reliable, it
is indispensable.

They will come.

Thank you!



NOAA FISHERIES SERVICE
Northeast Fisheries Science Center
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

*Northeast
Cooperative Research
Program*

V Northeast Fishery Sector Inc.

Northeast Sector Services Network



MAINE COAST
FISHERMEN'S
ASSOCIATION

GORDON AND BETTY
MOORE
FOUNDATION

The FAST tool is a web-delivered software application. It is written in the Drupal content management system, leveraging an open-sourced technology stack that includes:

- Operating system: Amazon Linux 64-bit Ubuntu 10.04 LTS (Lucid Lynx) Server
- 2 Disk Elastic Block Storage (32 GB - software, 200 GB – data)
- Apache PHP 5.3.6
- PostgreSQL with PostGIS for spatial data
- Drupal CMS – Omega responsive theme for mobile access
- Open Layers/ Ext JS JavaScript library for mapping interface
- GeoServer for integration of shape (.shp) and r-based output files
- Web service integration for oceanographic data through
- Python scripting for data acquisition and integration
- PHP-based alert system for email notifications