

The Atlantic Cooperative Telemetry Network: collaborative efforts, current status, & directions

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Overview

- Background: acoustic telemetry
- How ACT came to be
 - Developing the network
 - Benefits
 - Challenges
- Where ACT is today
- Where we are hoping to go
- Example of why data sharing is so important



ACOUSTIC TELEMETRY MYTHS



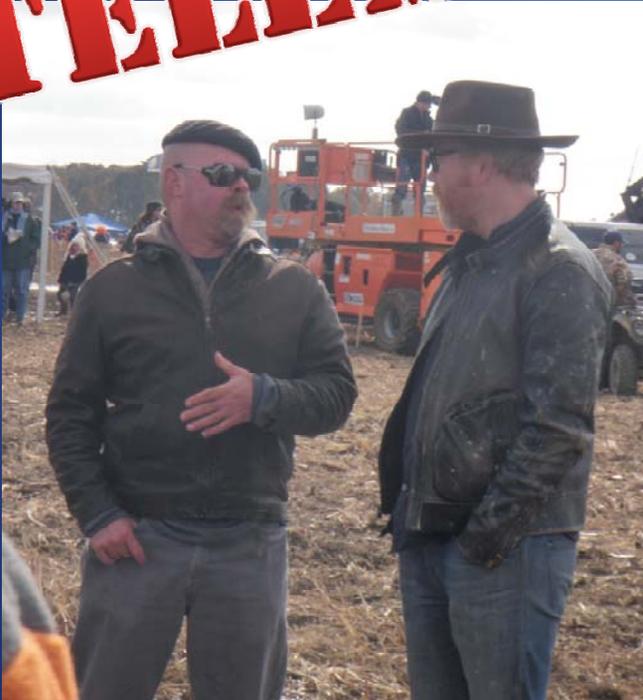
- When a fish gets tagged, it remains in a researcher's array
- Researchers can gain all of the information they need from their individual arrays
- It's a piece of cake!

ACOUSTIC TELEMETRY MYTHS



- When a fish gets tagged, it remains in a researcher's array

ACOUSTIC TELEMETRY MYTHS



- When a fish is captured, it remains in a researcher's array

BUSTED

FISH MOVE!

ACOUSTIC TELEMETRY MYTHS



- Researchers can gain all of the information they need from their individual arrays

ACOUSTIC TELEMETRY MYTHS

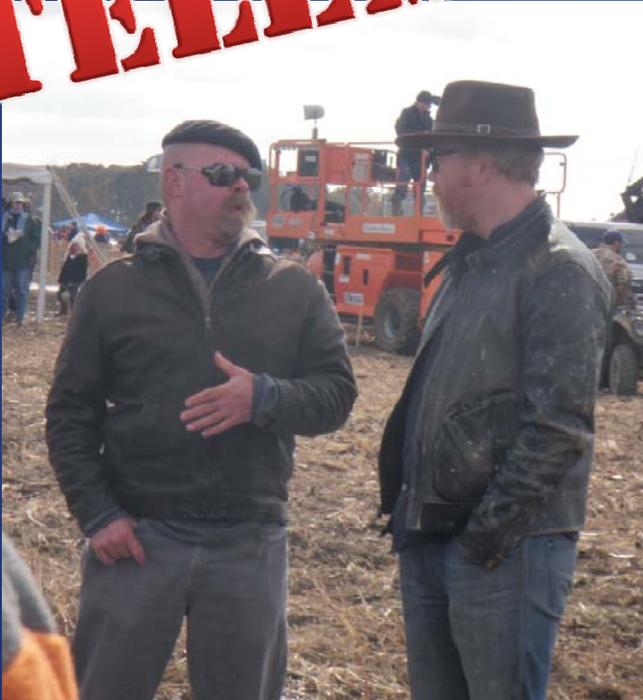


- Researchers can gain all of the information they need from their individual arrays

**Examining movement
beyond tagging systems
develops a better picture
of a species**

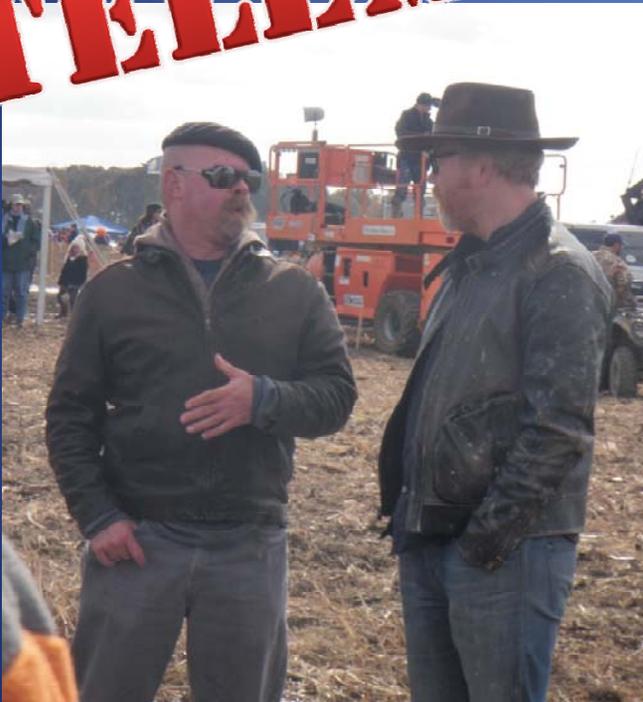
BUSTED

ACOUSTIC TELEMETRY MYTHS



- It's a piece of cake!

ACOUSTIC TELEMETRY MYTHS



- It's a nice educational

BUSTED

My talk begins....

About acoustic telemetry...

- Historically short-term regional studies using manual tracking techniques
 - Labor intensive
 - Weather dependent
 - Expensive \$\$\$\$\$



About acoustic telemetry...

- Historically short-term regional studies using manual tracking techniques
 - Labor intensive
 - Weather dependent
 - Expensive \$\$\$\$\$
- New technology
 - Longer tag life
 - More information from tags
 - Passive receivers
 - Lower cost \$\$



With passive receivers comes...

A way to...

- look at presence/absence in an area
- follow tagged individuals for multiple seasons (potentially)
- track multiple species at a given time in a given area
- utilize current receiver technology to create 3-D models of fine scale movement



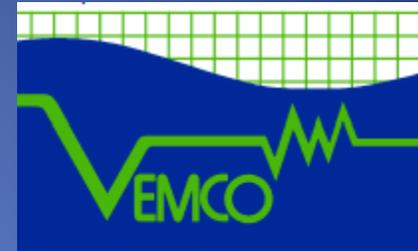
What is ACT?

- It all started with sturgeon.....
- 2006 ASMFC Atlantic Sturgeon Technical Committee Meeting
 - Anadromous/Migratory species

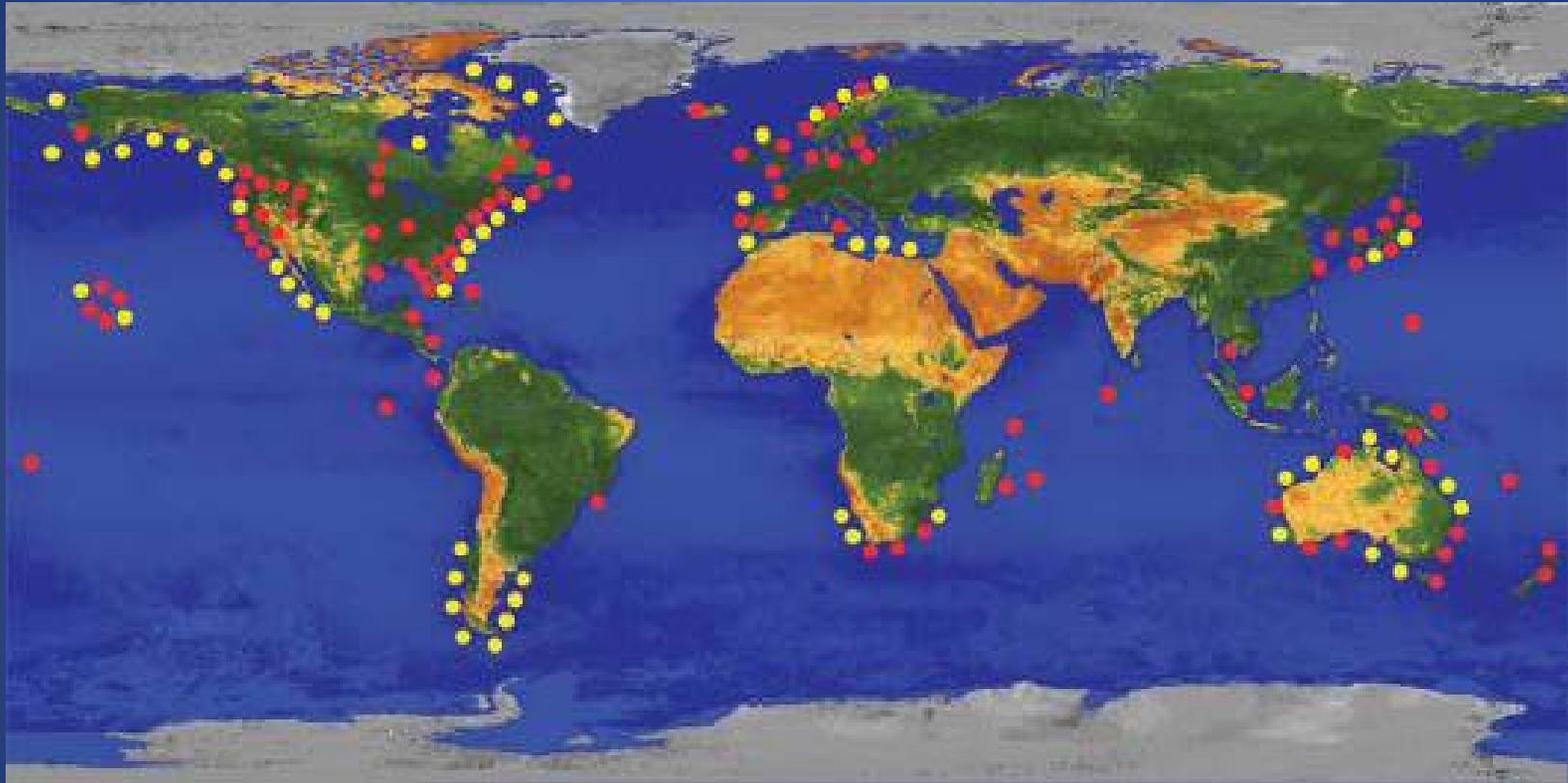


“Standard” Equipment....

- What is being used?
 - VEMCO, LOTEK, HTI, etc.
 - Passive arrays, manual equipment, combinations
- Many researchers are using VEMCO or VEMCO compatible equipment
- Why?



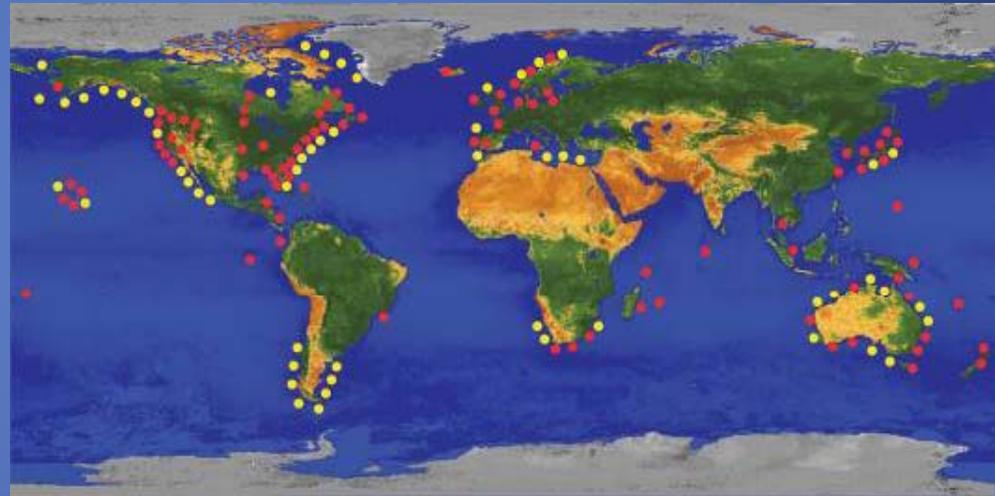
“Standard” Equipment....



- Current VEMCO Customer Receiver Arrays
- Proposed VEMCO Customer Receiver Arrays

“Standard” Equipment....

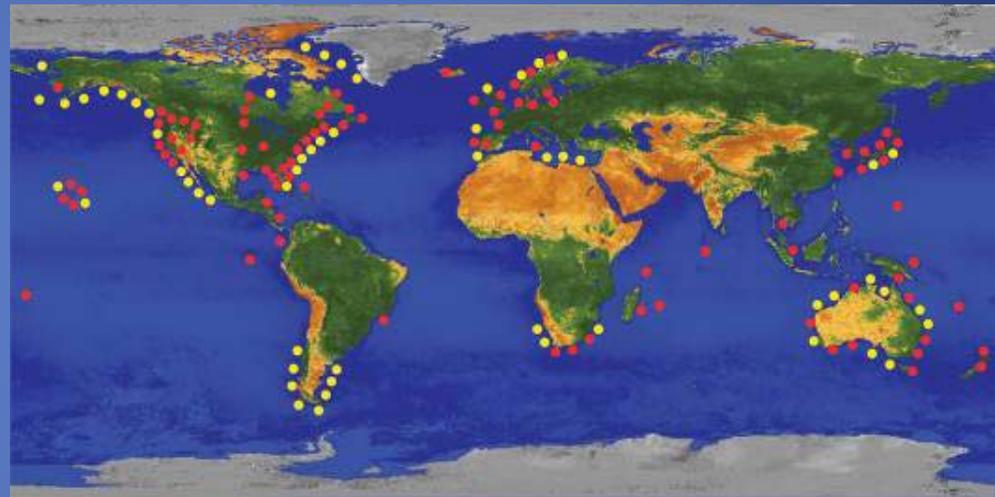
- Why?
 - Arrays are clearly extensive - making data sharing a true possibility
 - The price is right
 - The equipment is “reliable”



- Current VEMCO Customer Receiver Arrays
- Proposed VEMCO Customer Receiver Arrays

“Standard” Equipment....

- Why?
 - Arrays are clearly extensive - making data sharing a true possibility
 - The price is right
 - The equipment is “reliable”



- Current VEMCO Customer Receiver Arrays
- Proposed VEMCO Customer Receiver Arrays

What needs to be done in order to share data.....

Historical Data-Sharing



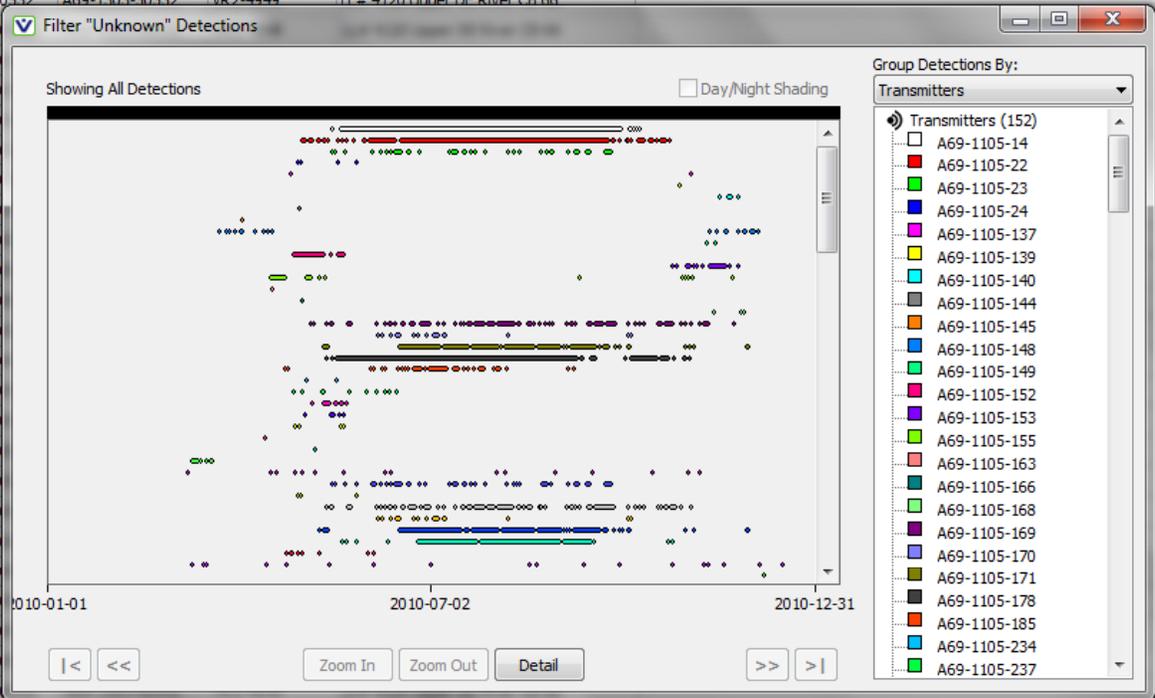
VUE - 2010_DE_Bay_processing.vdb

File Search Receiver Transmitter Station Tools Help

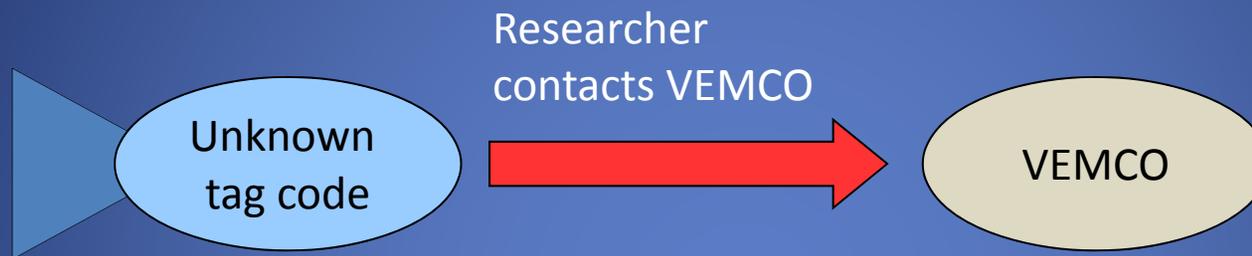
- HSC
- Hudson-AS_Erickson_853to860
- James_River_AS_133xx_series
- James_River_AS_138xx_series
- James_River_AS_144xx_series
- James_River_AS_296x_series
- James_River_AS_all_10
- Josh_Smith_VIMS_5686to5705
- Mathers_56804to56838
- Mathers_60030_to_60045
- Mathers_all
- MA_DMF_Hoffman_13622to13673
- MA_DMF_Hoffman_49602to49626
- MA_DMF_Hoffman_59653to59722
- MA_DMF_Hoffman_all
- MA_STS_59743to59752
- ME_DMR_61to65
- ME_DMR_5246to5267
- ME_DMR_12612to12616
- ME_DMR_All
- Miller/Target_09_58849to58861
- Not_DSU
- Savoy_2009_243to253
- Savoy_2009_12397to12406
- Savoy_2009_13290to13309
- Savoy_all
- SCUTES_60210to60222
- Secor/Wingate_2007tags_81to126
- Secor/Wingate_2007tags_12967to12996
- Secor/Wingate_2009tags_62478to62532
- Secor/Wingate_all
- Sulkowski_54169to54192
- Unknown

Detections: 416254

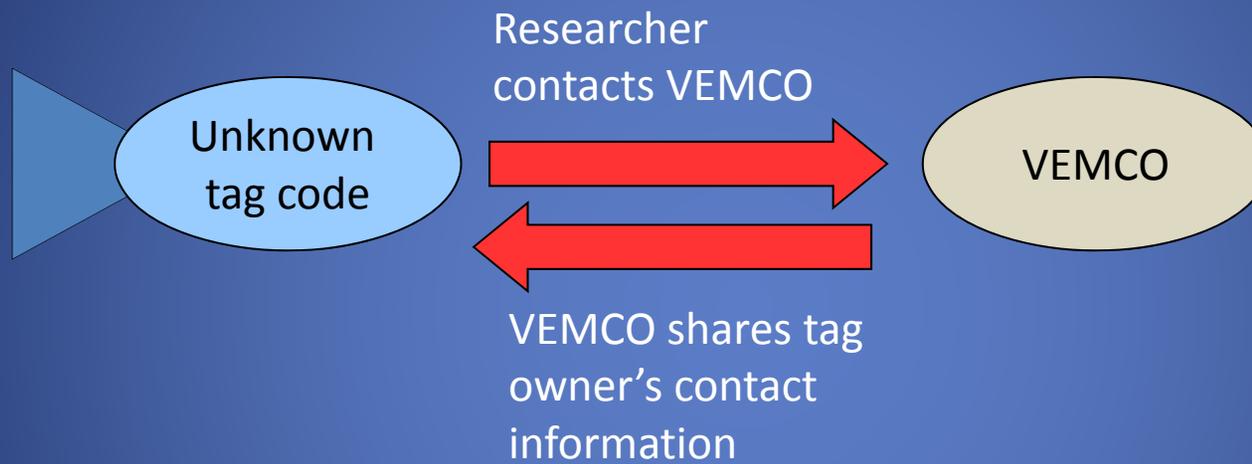
Date	Time	Code Space	ID	Transmitter	Receiver	Station	Data
2010-01-01	00:00:01	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:03:55	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:06:00	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:10:06	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:18:45	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:21:16	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:23:45	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:26:11	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:32:26	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:33:28	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:34:36	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:39:06	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:42:56	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:46:16	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:48:09	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:50:57	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:55:14	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:56:44	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	00:58:50	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	01:02:55	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	01:05:15	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	01:07:23	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	01:09:07	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	01:10:04	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	01:11:02	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	01:12:08	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	01:13:26	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	01:15:08	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	
2010-01-01	01:20:09	A69-1303	50532	A69-1303-50532	VR2-4949	LL# 4120 Upper DE River CB 66	



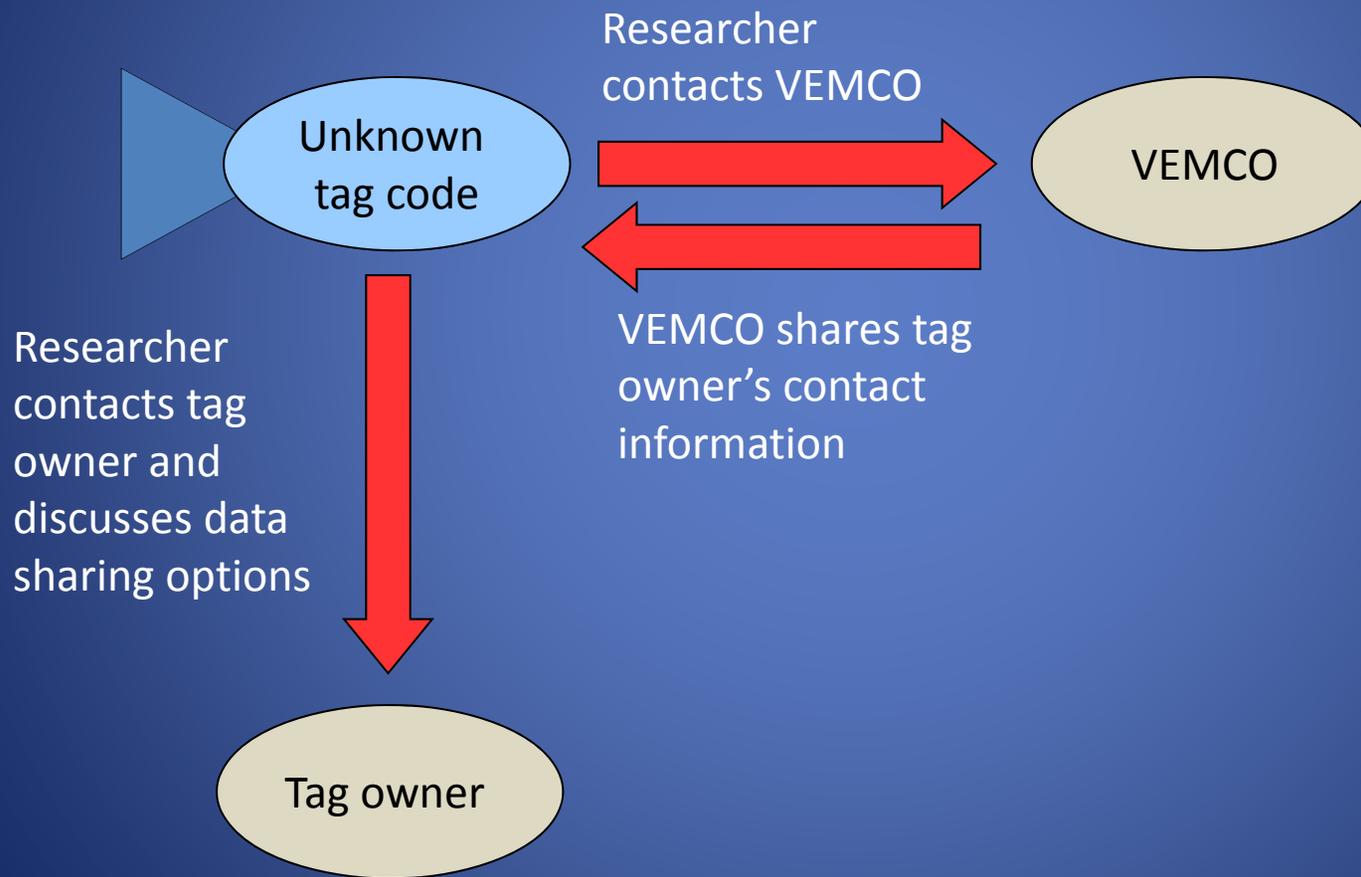
Historical Data-Sharing



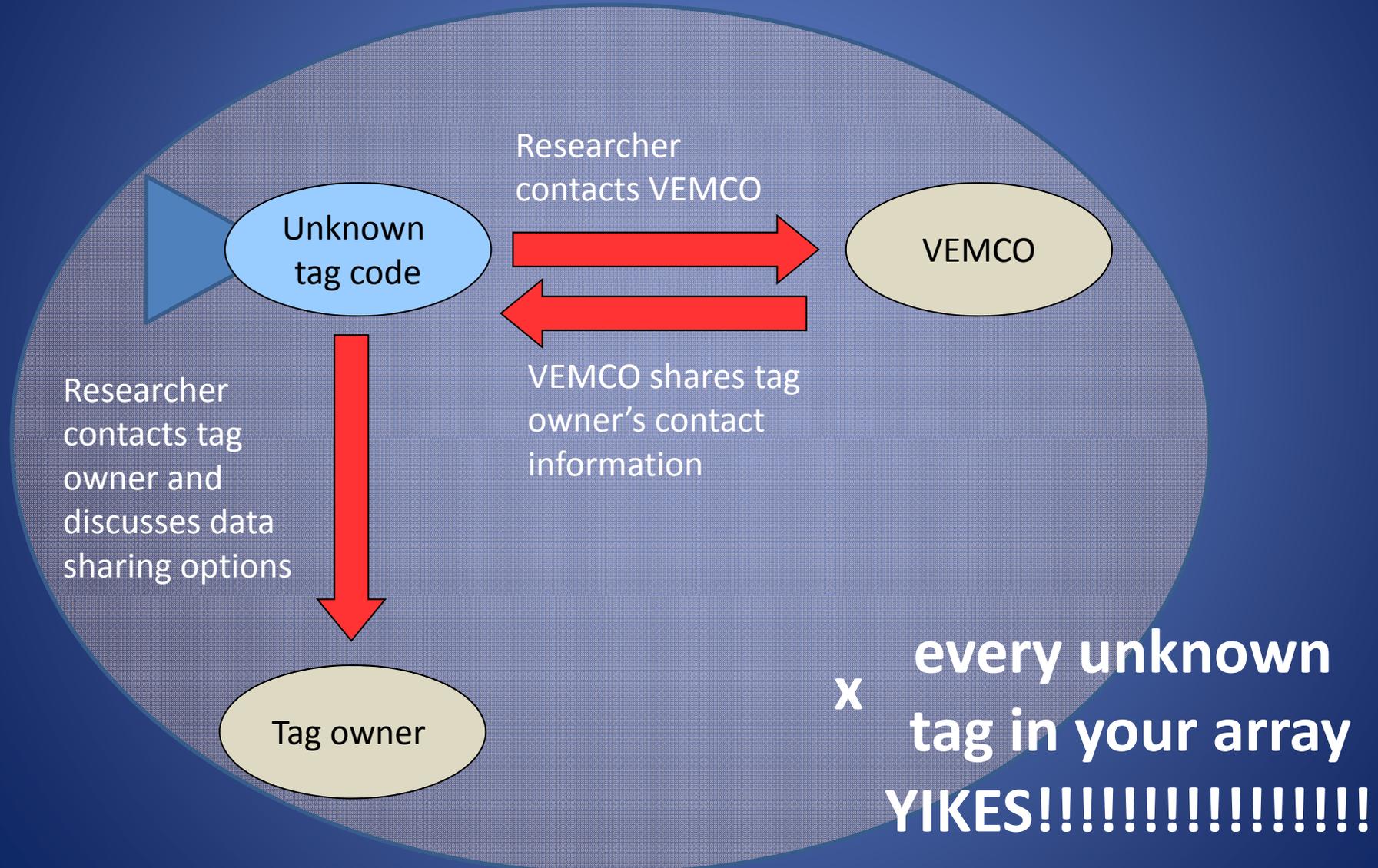
Historical Data-Sharing



Historical Data-Sharing

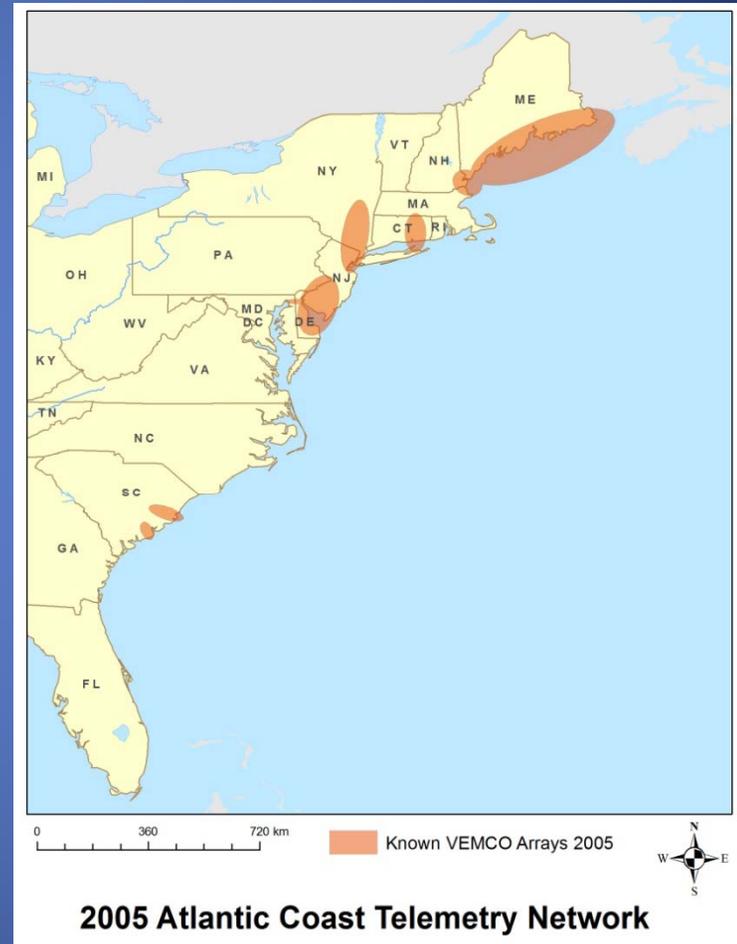


Historical Data-Sharing



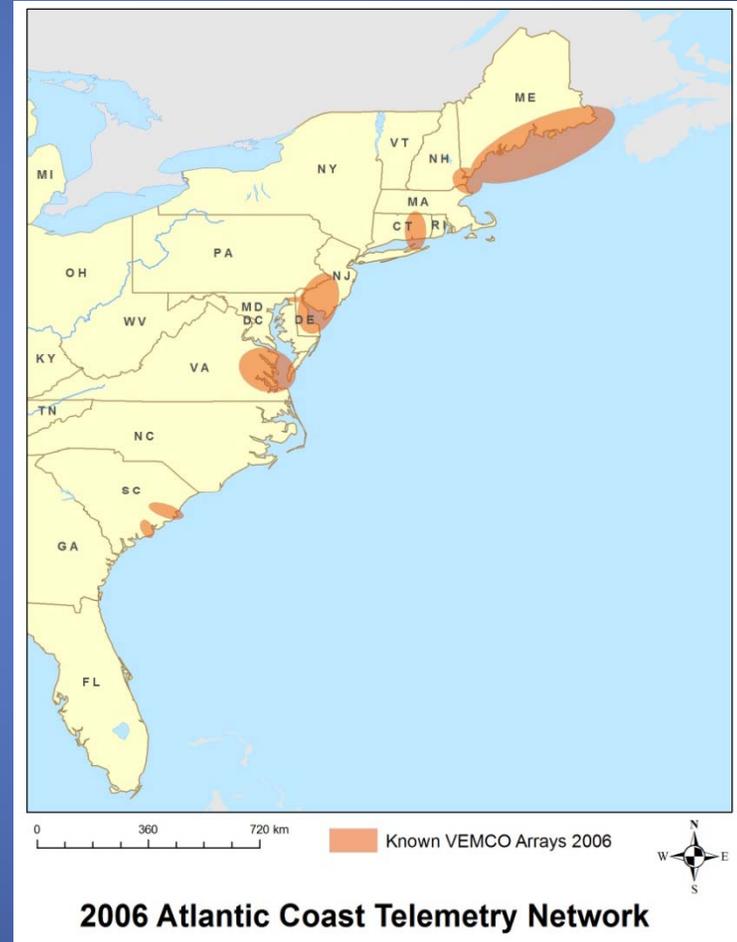
ACT Development

- 2005 - 12 researchers



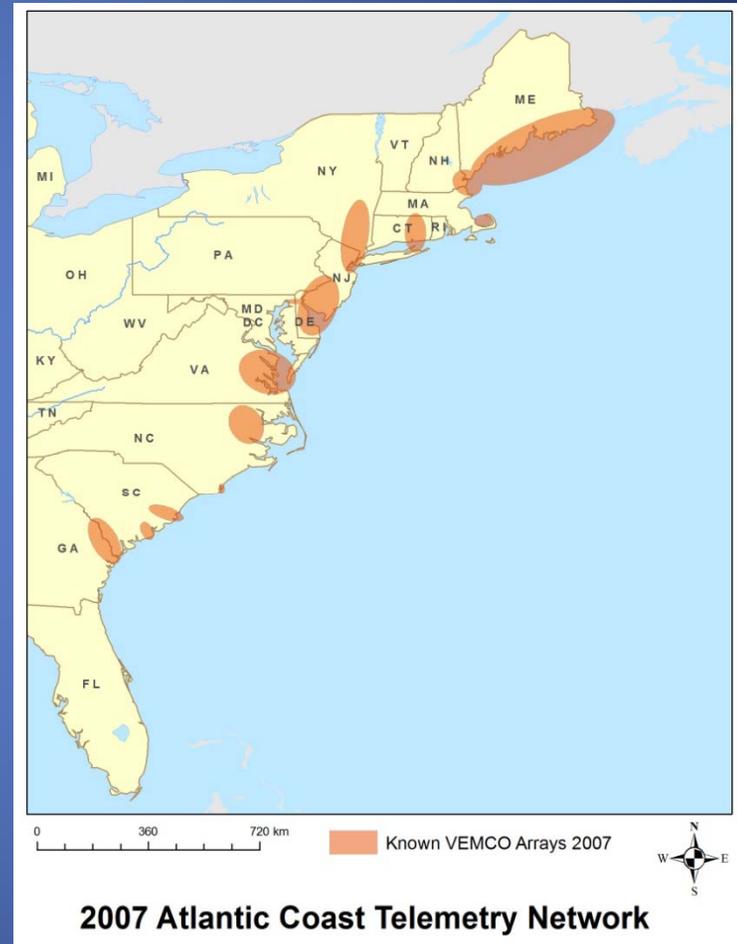
ACT Development

- 2005 - 12 researchers
- 2006 - 15 researchers



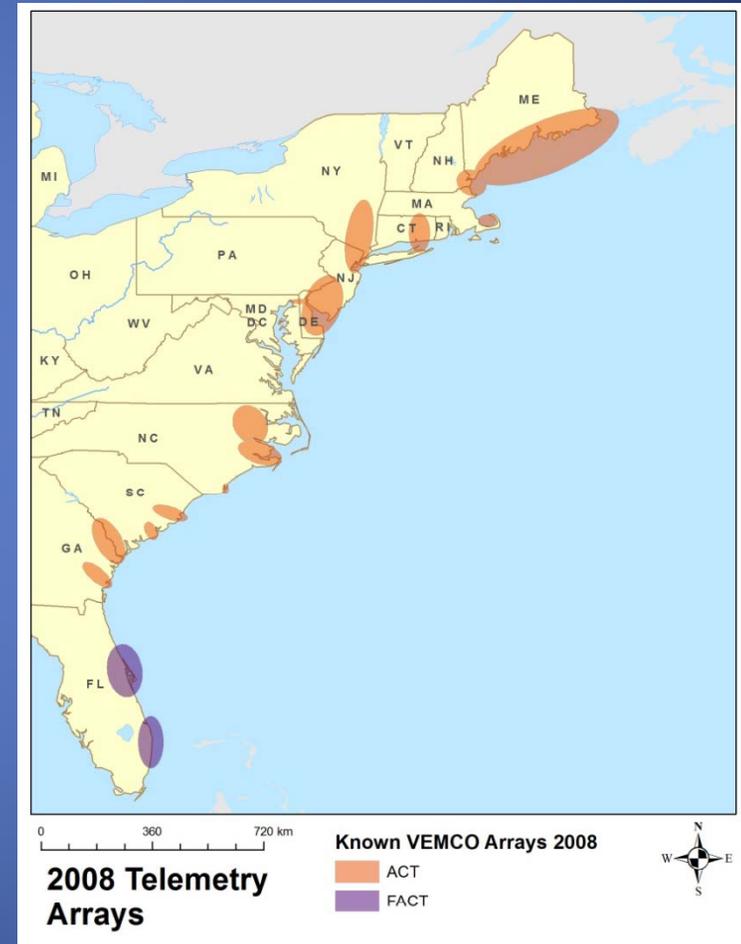
ACT Development

- 2005 - 12 researchers
- 2006 - 15 researchers
- 2007 - 25 researchers



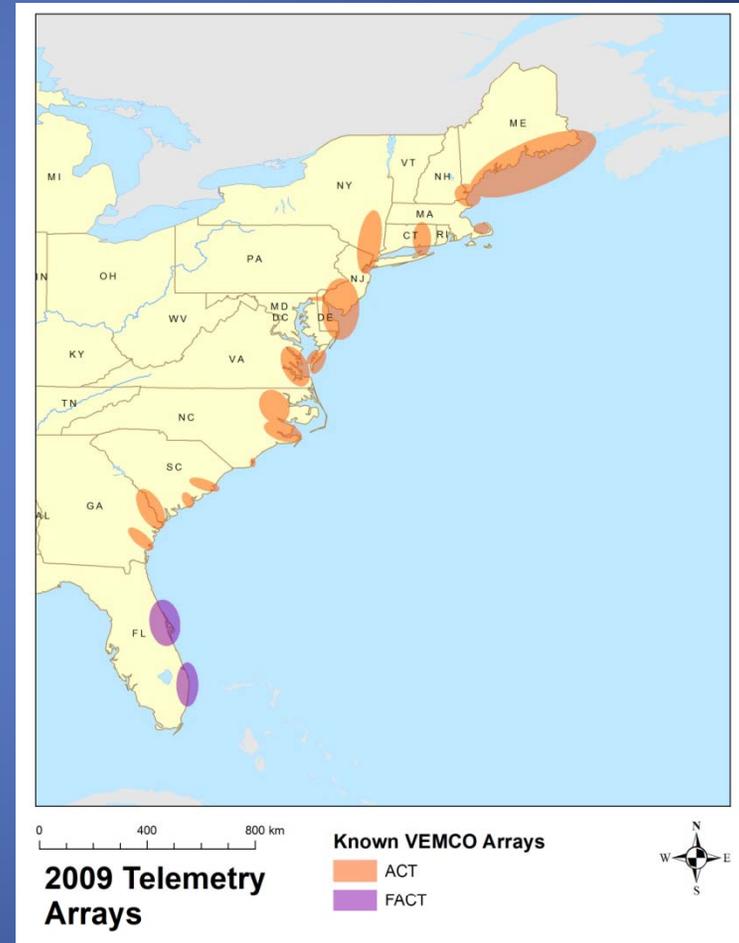
ACT Development

- 2005 - 12 researchers
- 2006 - 15 researchers
- 2007 - 25 researchers
- 2008 - 31 researchers
 - Addition of FACT Group



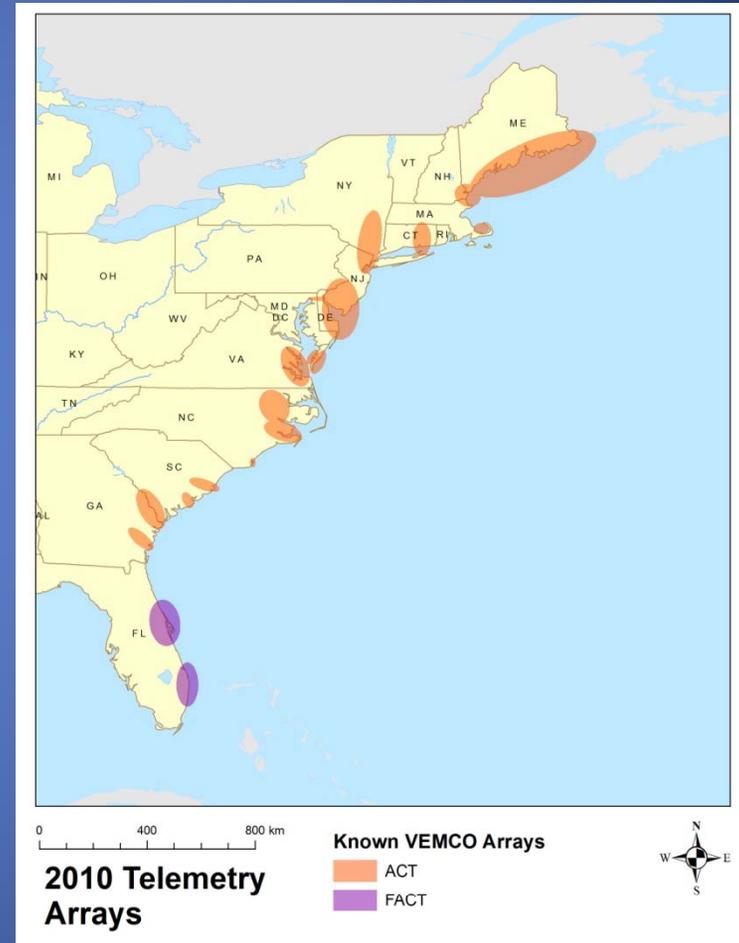
ACT Development

- 2005 - 12 researchers
- 2006 - 15 researchers
- 2007 - 25 researchers
- 2008 - 31 researchers
 - Addition of FACT Group
- 2009 - 33 researchers



ACT Development

- 2005 - 12 researchers
- 2006 - 15 researchers
- 2007 - 25 researchers
- 2008 - 31 researchers
 - Addition of FACT Group
- 2009 - 33 researchers
- 2010 - 63 researchers



Deployed Transmitters

Year	Quantity
No year	871
1905	21
2004	13
2005	539
2006	528
2007	645
2008	652
2009	942
2010	1077
Total	5288

*Based on queries of the newest ACT list. Typos and duplications may create discrepancies.

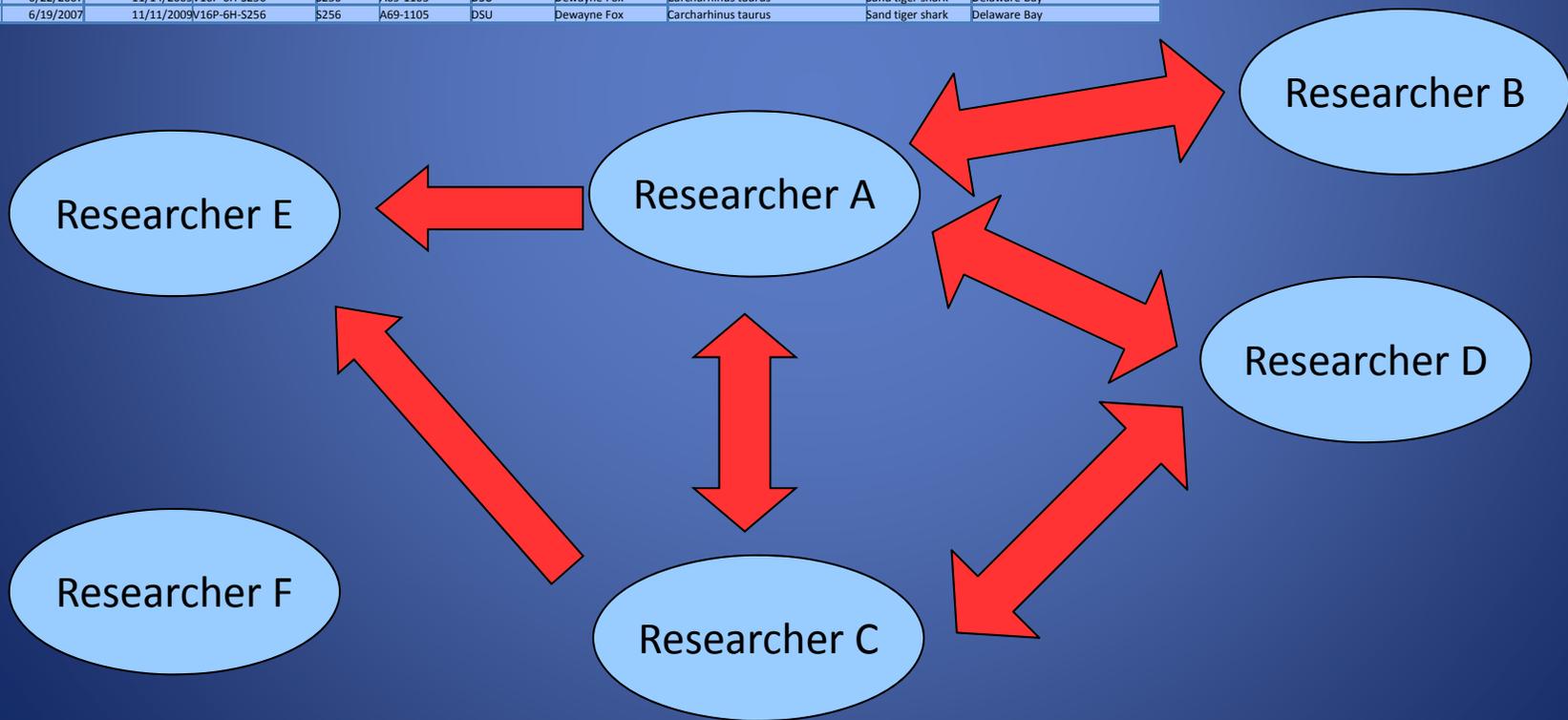
Who's doing what?

List Year	Species	Number of Researchers*
2008	Atlantic sturgeon	10
	Shortnose sturgeon	3
	All of ACT - 30 species based on common names - 31 species based on scientific names	33
2009	Atlantic sturgeon	10
	Shortnose sturgeon	3
	All of ACT - 30 species based on common names - 33 species based on scientific names	36
2010	Atlantic sturgeon	15
	Shortnose sturgeon	4
	All of ACT - 38 species based on common names - 40 species based on scientific names	49
2011	Atlantic sturgeon	36
	Shortnose sturgeon	6
	All of ACT - 44 species based on common names - 49 species based on scientific names	63

*This is based on queries of the newest ACT list (typos and duplications may be inflating these numbers)

ACT Current Data-Sharing

ID_Code	Release_Date	Expiration_Date	Tag_Type	Coding	Channel	Tagging_Organi- zation	Researcher	Species	Common_Name	Release_Location
27	7/21/2008	11/11/2010V16P-6H		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
28	6/28/2008	10/19/2010V16P-6H		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
29	6/28/2008	10/19/2010V16P-6H		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
30	7/21/2008	11/11/2010V16P-6H		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
31	6/28/2008	10/19/2010V16P-6H		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
32	7/2/2008	10/23/2010V16P-6H		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
33	7/7/2008	10/28/2010V16P-6H		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
34	6/30/2008	10/21/2010V16P-6H		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
35	7/5/2008	10/26/2010V16P-6H		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
36	7/2/2008	10/23/2010V16P-6H		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
157	8/26/2008	12/17/2010V16P-6H		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
158	8/26/2008	12/17/2010V16P-6H		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
159	8/26/2008	12/17/2010V16P-6H		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
160	8/26/2008	12/17/2010V16P-6H		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
161	8/26/2008	12/17/2010V16P-6H		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
162	8/26/2008	12/17/2010V16P-6H		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
209	6/22/2007	11/14/2009V16P-6H-S256		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay
210	6/19/2007	11/11/2009V16P-6H-S256		\$256	A69-1105	DSU	Dewayne Fox	Carcharhinus taurus	Sand tiger shark	Delaware Bay



Establishing the Rule - Benefits and Challenges



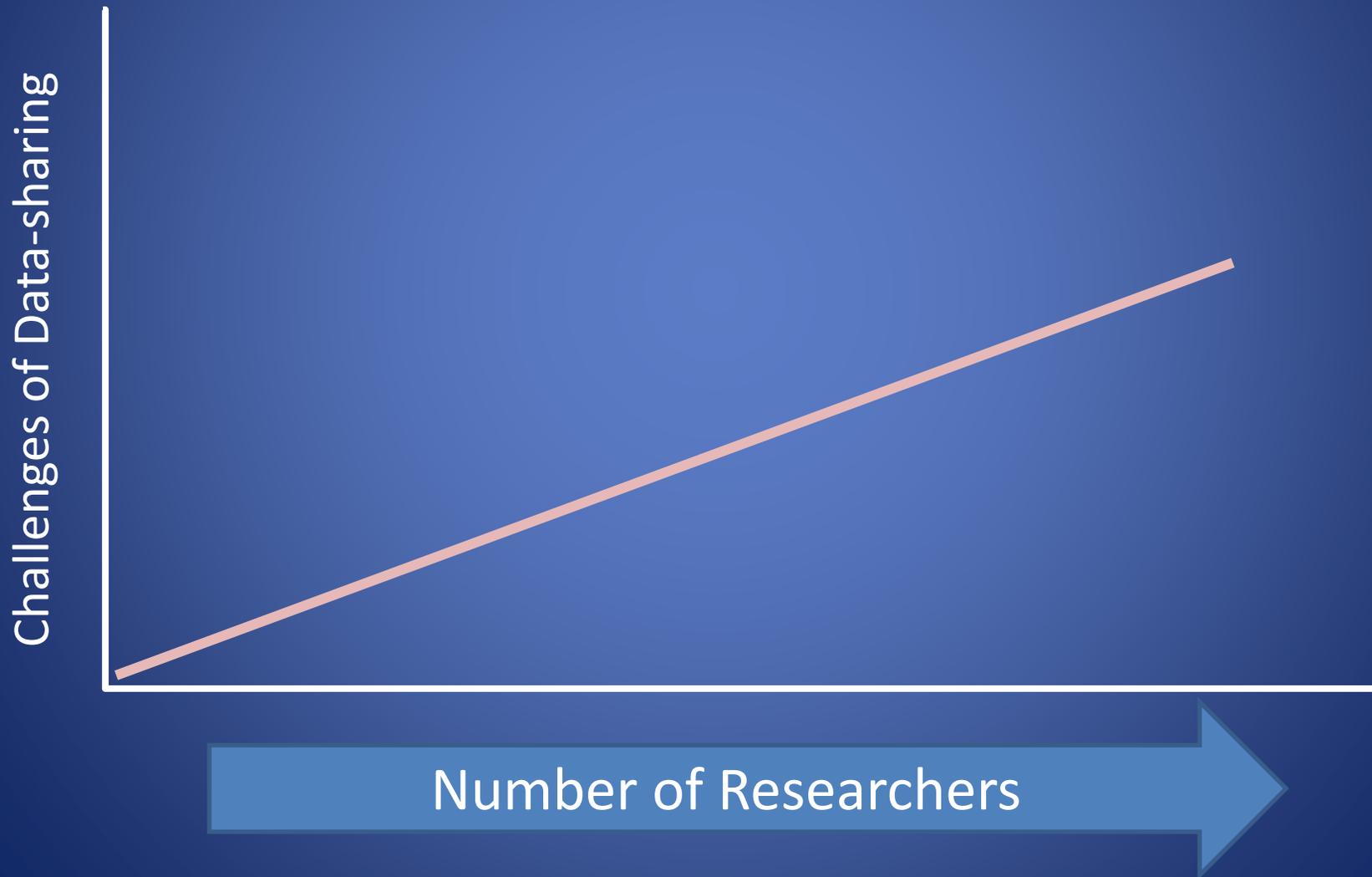
The daydreams of cat herders

Establishing the Rule - Benefits

- Collaboration allows for more complete and compelling image of movement
- Researchers will be able to leverage arrays for future funding
- Identifying gaps in the array for better coverage



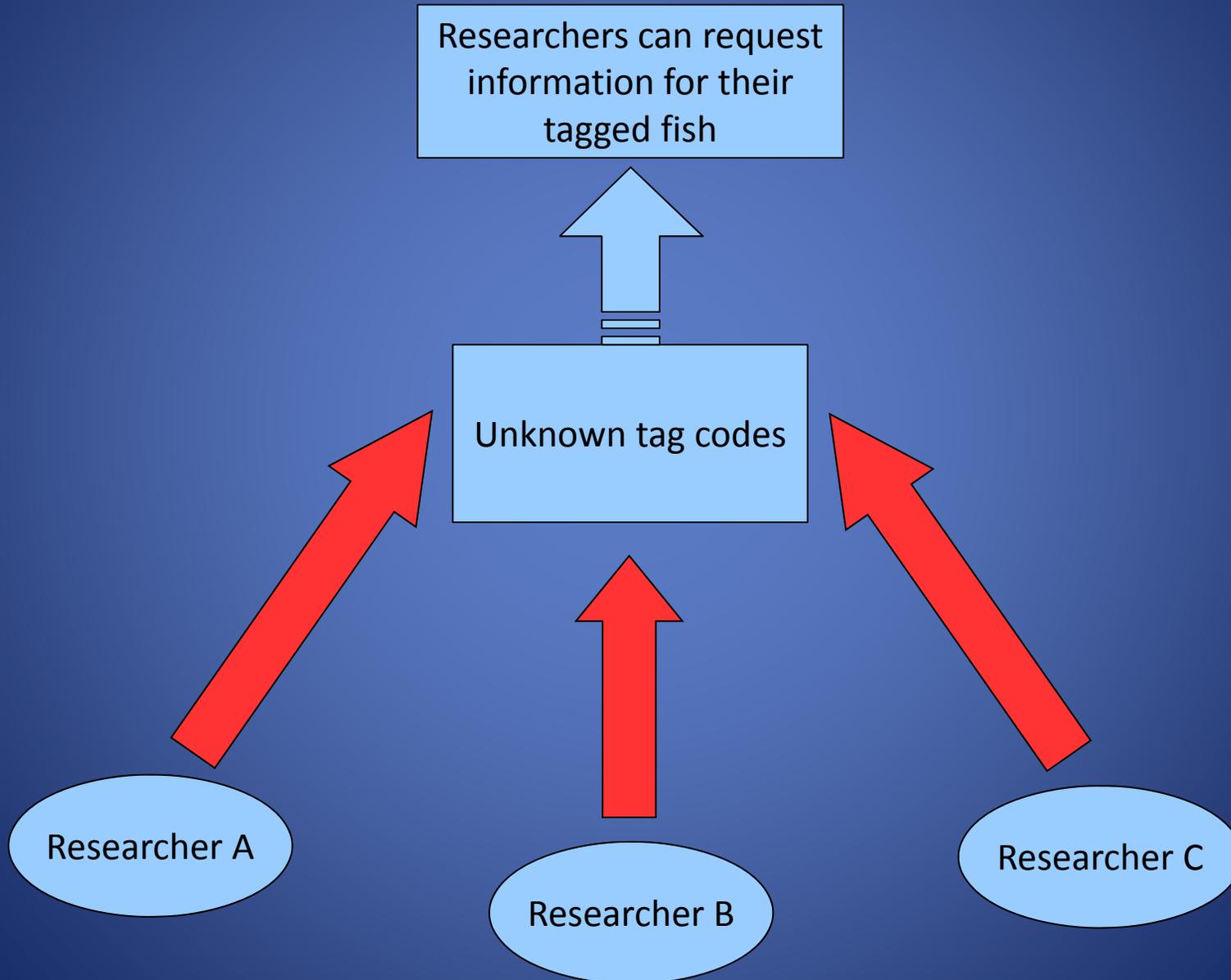
Establishing the Rule - Challenges



Establishing the Rules

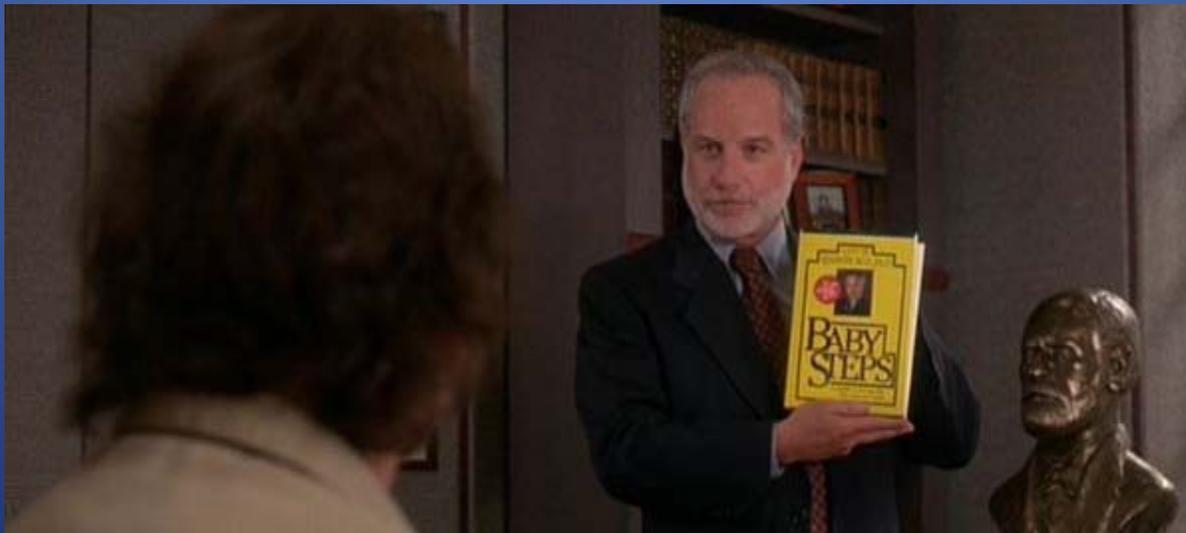
- Rules of Engagements...
 - What data are we going to share?
 - Standardizing formatting between researchers for sharing purposes.
 - How often are we going to require data-sharing?
 - Will we make data generally available to others?
- Different Strokes for Different Folks....
 - Developing an acceptable system for all researchers.
 - Making the effort worth while for as many individuals as possible.

Planned Data Sharing

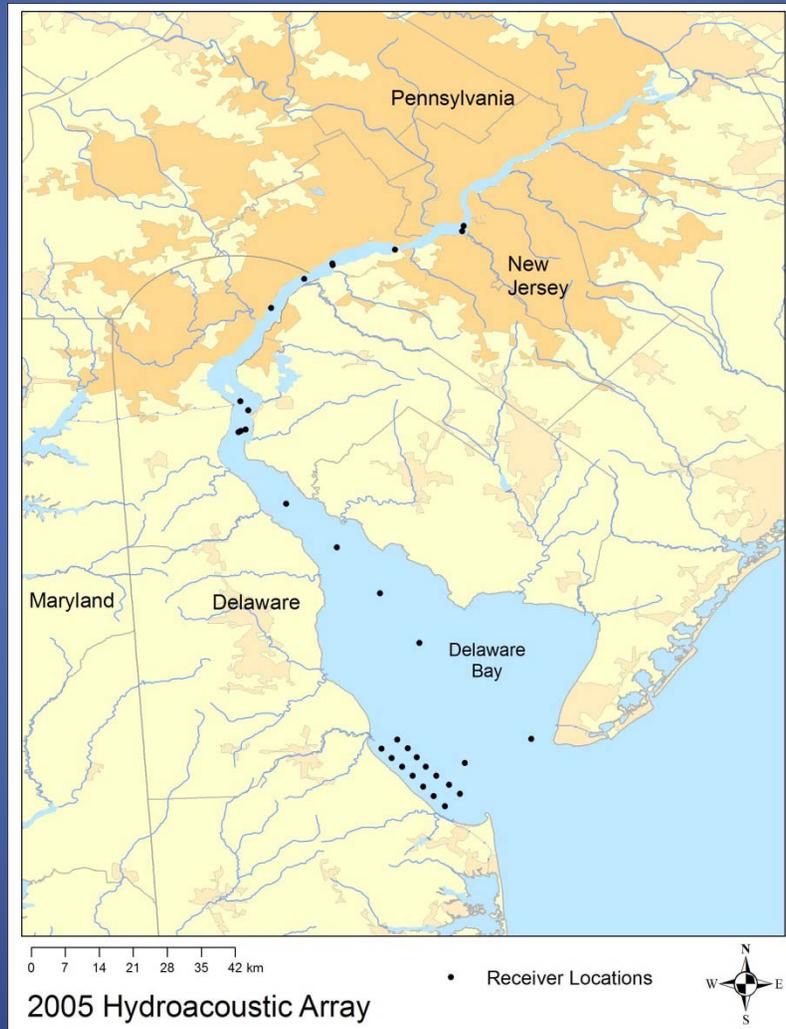


Baby-steps.....

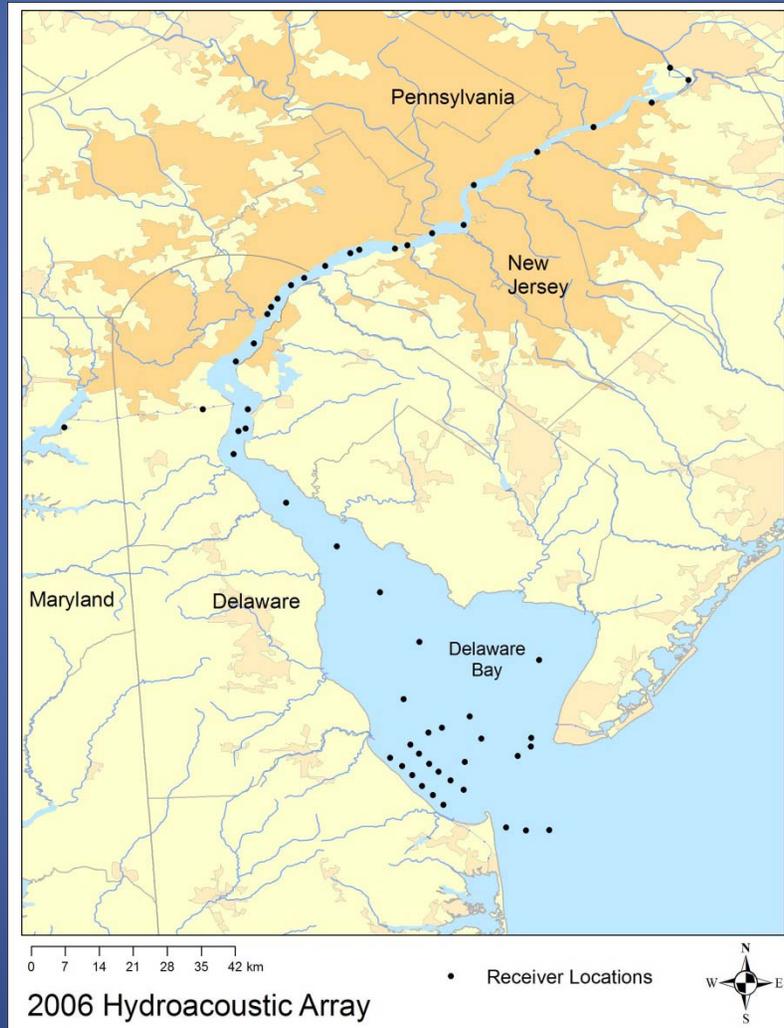
- Section 6 funding (Thank You)
 - having a coordinator working specifically maintaining and developing ACT
- Maintain what we have
 - keep sharing with everyone, but work to develop and create a database that will eventually be web-enabled (but we will start with requests)
- Start small
 - establish sturgeon data and then continue to bring in other data into the fold



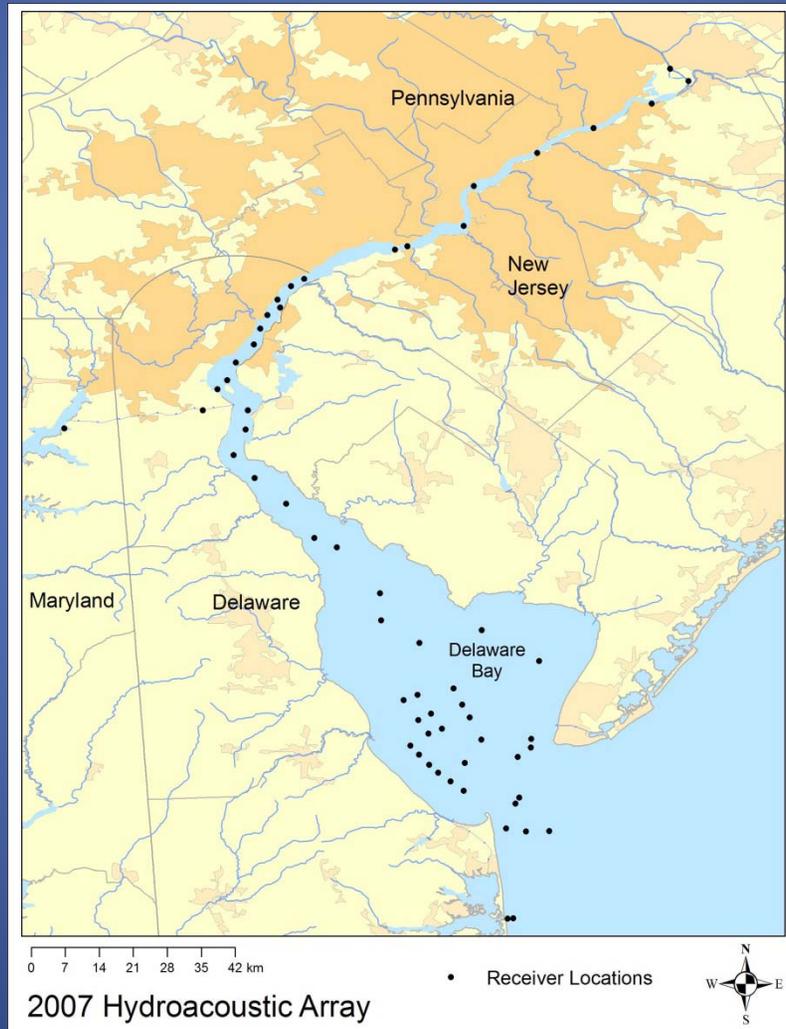
What we are seeing in the Delaware System



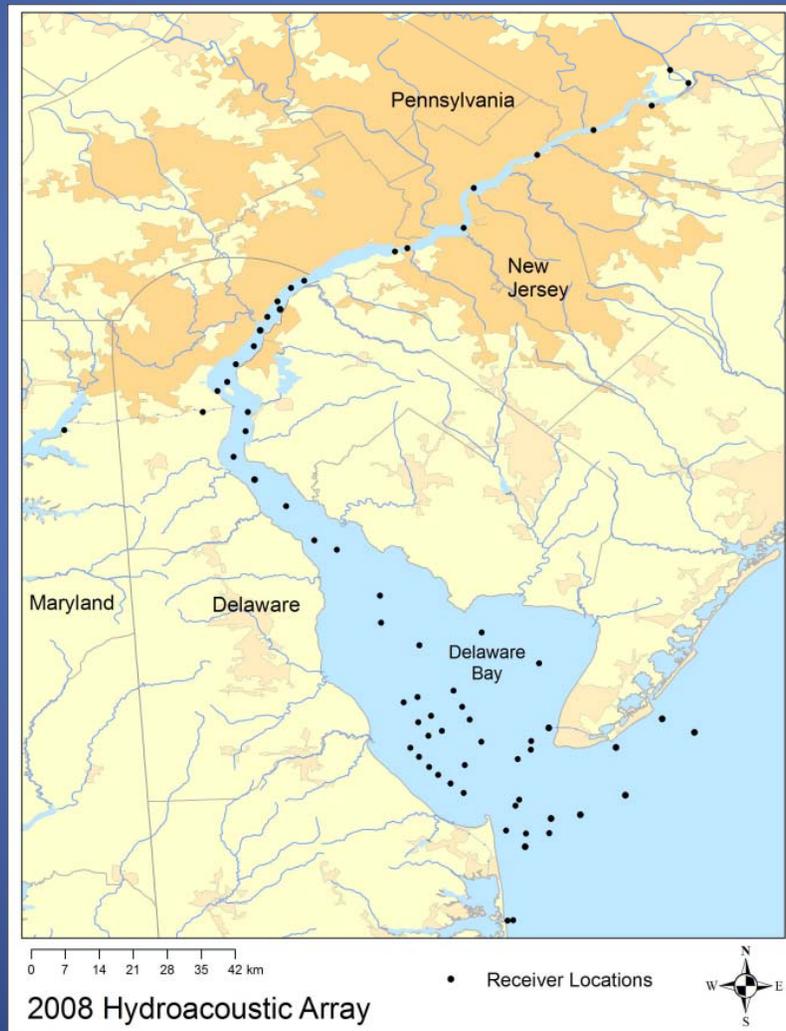
What we are seeing in the Delaware System



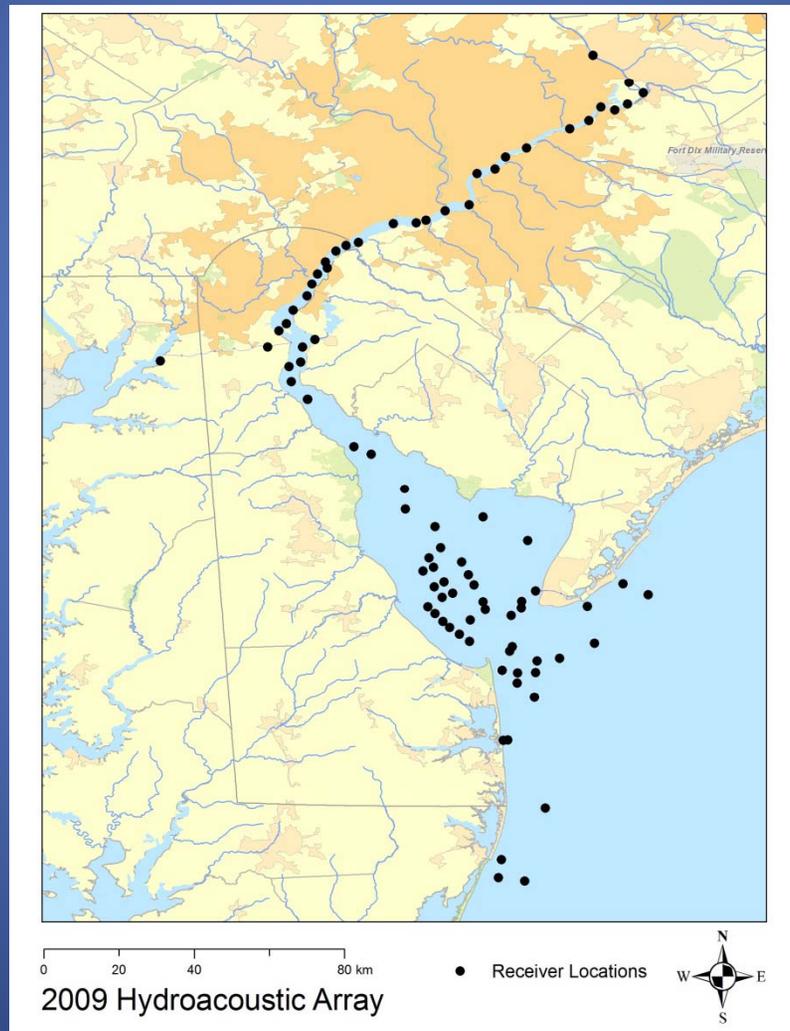
What we are seeing in the Delaware System



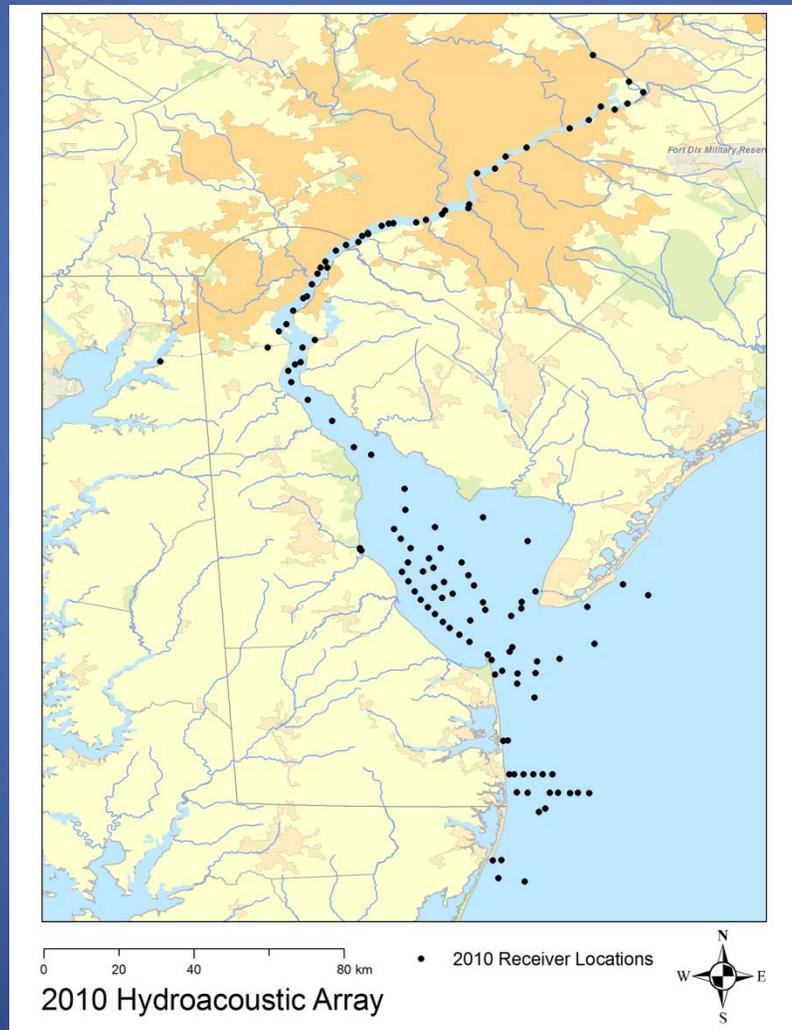
What we are seeing in the Delaware System



What we are seeing in the Delaware System



What we are seeing in the Delaware System



What we are seeing in the Delaware System

	2008	2009	2010
Total Detections (minimum of 5 detections)	997756	1179925	1160909
DSU Detections	184076	521377	329043
Non-DSU Detections	813680	658548	834702
Number of Receivers	70	85	131

	2008	2009	2010
Total Number of Tags	333	309	503
DSU Tags	123	138	220
Non-DSU Tags	210	171	286+

Data filtered – minimum 5 detections included in dataset



Atlantic Sturgeon

Number 54856

FL 142cm

Weight 32kg

Tagging date 4/29/09





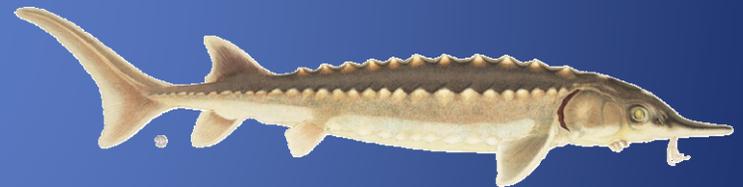
Atlantic Sturgeon

Number 48782

FL 172cm

Weight 50kg

Tagging date 4/21/10



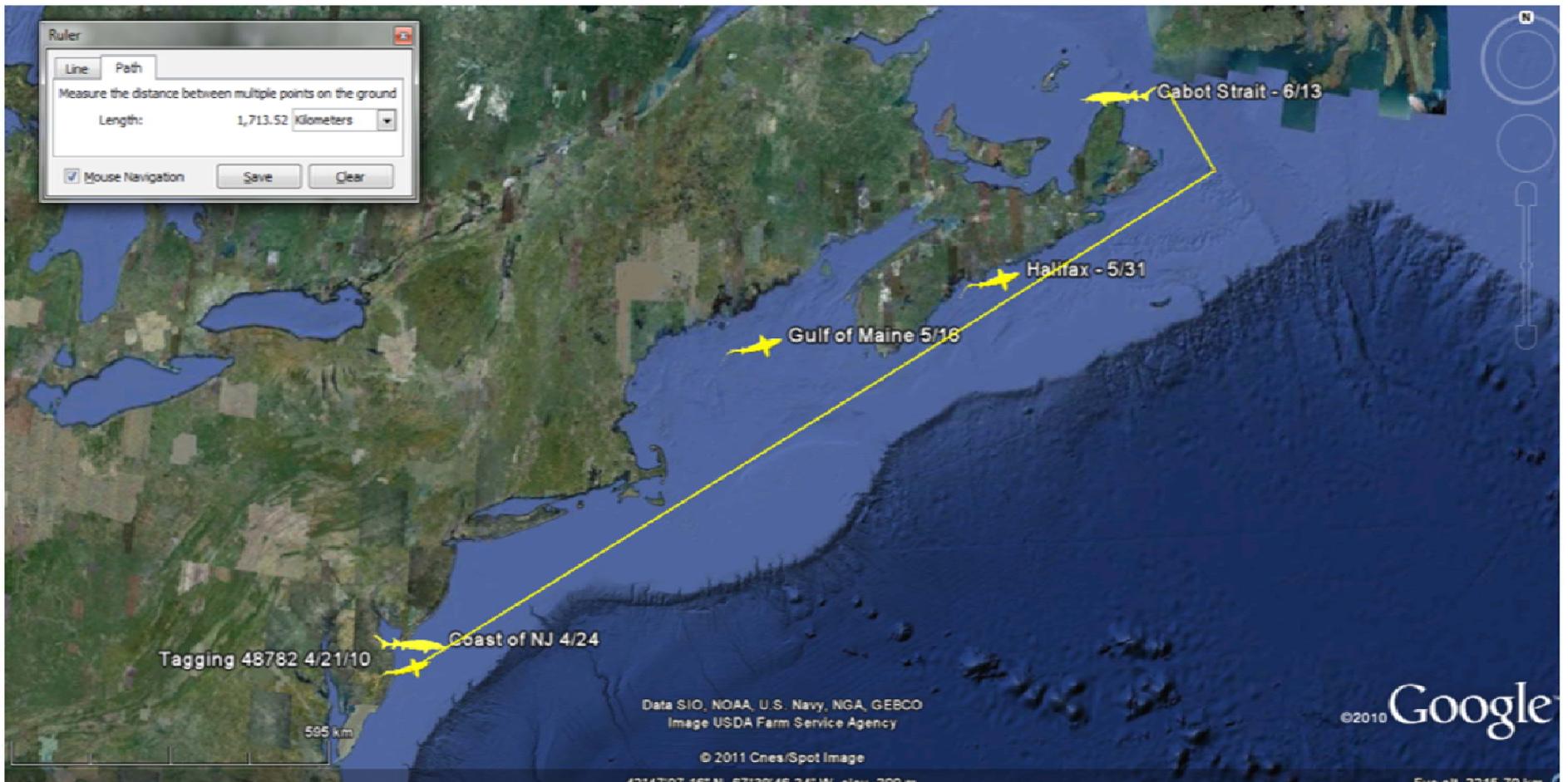
Atlantic Sturgeon



Number 48782

1700km+

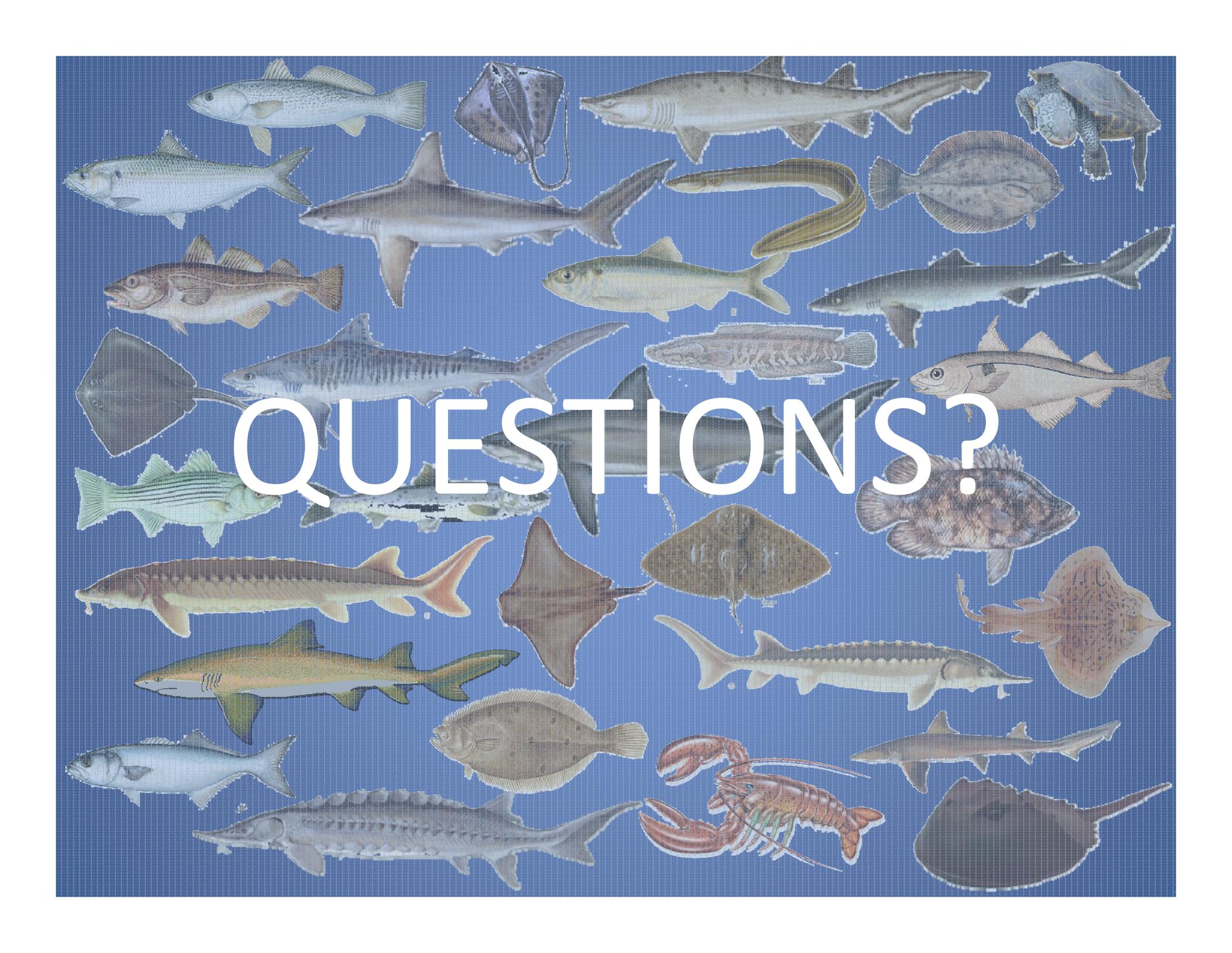
53 Days



Thank You

- ACT collaborators present and future....
- Students and researchers that have been collecting and sharing their data
- VEMCO
- NOAA



A collage of various marine life including fish, sharks, rays, a lobster, and a turtle on a blue background with the word 'QUESTIONS?' in the center. The collage features a variety of species such as salmon, tuna, cod, sea bream, sea bass, and several types of sharks and rays. A lobster is also present in the lower right quadrant. The word 'QUESTIONS?' is written in large, white, sans-serif capital letters across the middle of the image.

QUESTIONS?