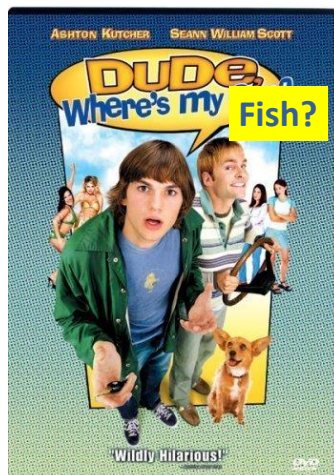


A collaborative fish tracking network in the tidal Hudson River

Dewayne Fox Delaware State University

Alternative Title



List of Conspirators/Collaborators

Lori M. Brown (DSU)

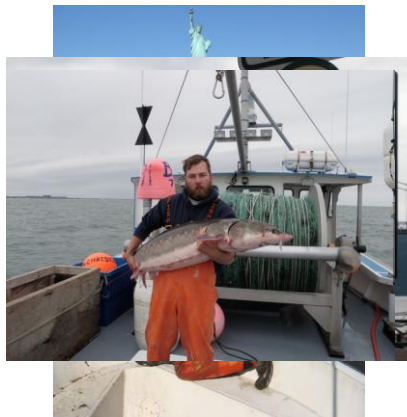


Amanda Higgs (NYSDEC)



List of Conspirators/Collaborators

Matthew W. Breece (DSU/UD)



Keith J. Dunton (SUNY/DSU)



Acknowledgements

- Captain Kevin Wark F/V Dana Christine II
- USCG 1st District Steve Pothier
- NOAA-NMFS Office of Protected Resources
 - Kim Damon-Randall, Lynn Lankshear, Dr. Lisa Manning
- DuPont Clear Into the Future Program
- Ike Wirgin (NYU) and Tim King (USGS)
- DSU & SUNY Students/Staff
- NYDEC HRFU Staff



Outline

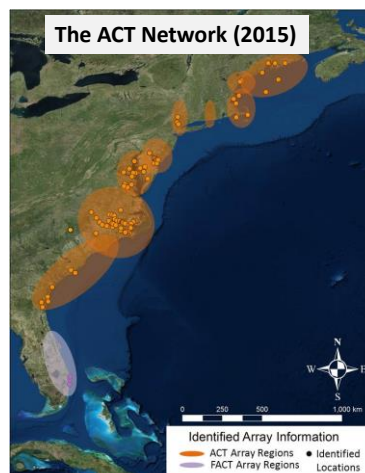
- Overview of Biotelemetry
 - Passive acoustic telemetry
- Tagging/Array Considerations
 - Real world examples
- Hudson Array Development
- Uncharismatic Megafauna Example
 - What is possible when we all work together....
- Future plans

Biotelemetry (AKA taggin' and trackin')

Platform	Accuracy	Active/Passive	Suitability	Costs
Radio	Meters (10s-100)	Both	FW< 15m low conductivity	\$200-400
Satellite	Kms (10s-100s)	Passive	FW/Marine	\$1.5-4K
Data Logging	Meters to Kms	Passive/Both	FW/Marine	\$300-1.5K
Acoustic	Meters (10s-Kms)	Both	FW/Marine	\$350-800

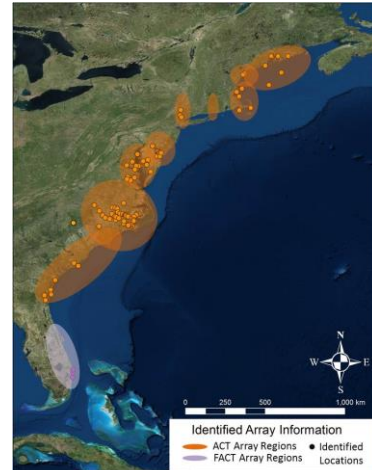
Acoustic Telemetry Networks

- Ocean Tracking Network – \$168 million global effort centered at Dalhousie University
 - Handles both receiver data and tag codes
 - OTN retains rights to data after negotiated period
 - Top-down
- Florida Atlantic Coast Telemetry (FACT) Network
 - Bottom-up
 - Handles both receiver data and tag codes for partners
- Atlantic Cooperative Telemetry (ACT) Network
 - Bottom-up
 - Manages tag codes and facilitates communication



The ACT Network

Year	Species Tagged	Researchers Providing New Transmitters	New Transmitters Deployed
2005	7	8	558
2006	18	18	521
2007	16	20	625
2008	25	23	677
2009	25	28	1,103
2010	28	30	1,380
2011	24	33	1,411
2012	35	36	1,318
2013	27	32	1,289
2014	26	33	1,367
2015 (to date)	2	2	53
Unknown Date			1,153
Totals: 83 Species - 110 Researchers - 11,455 Transmitters Deployed			

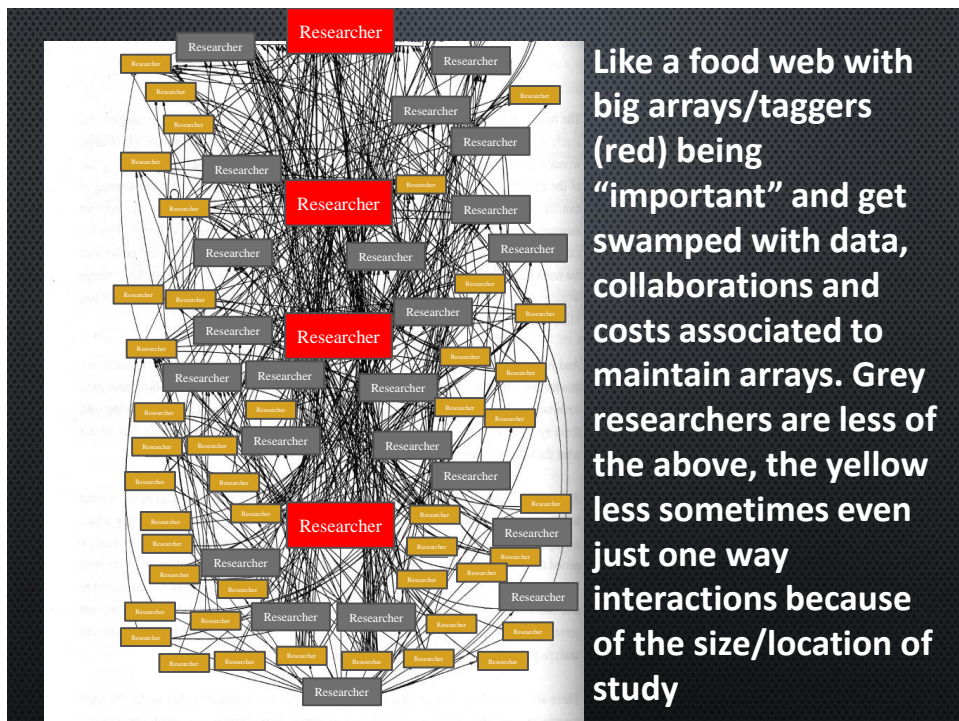


**Data sharing in the
world of telemetry...**

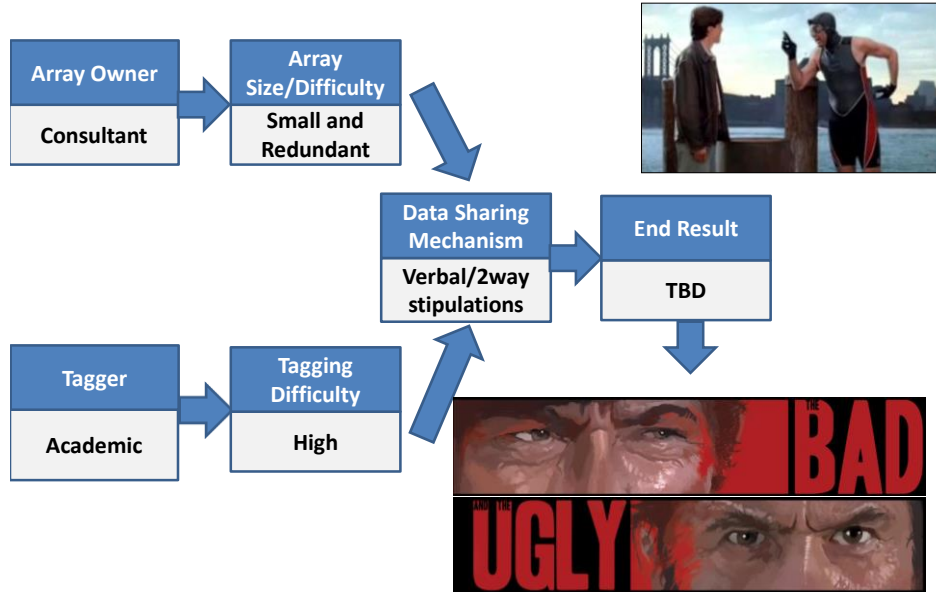


Plan of Attack

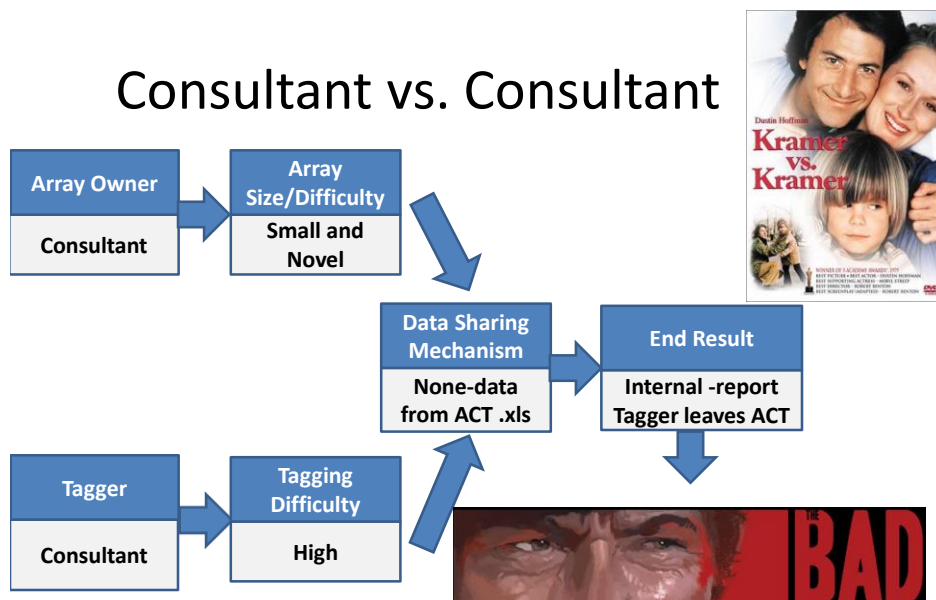
- Provide a few case studies which depict real world issues that have directly involved my lab
- Need- The relatively recent development and widespread use of compatible transmitters (up to 10 year battery life) and relatively low cost receivers ($\approx \$1,500$) has lead to an increasing number of issues



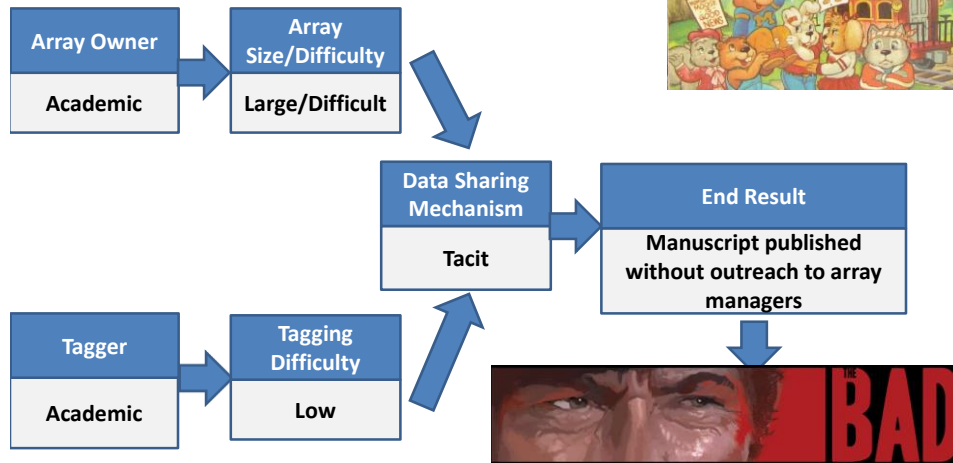
Small Industrial River



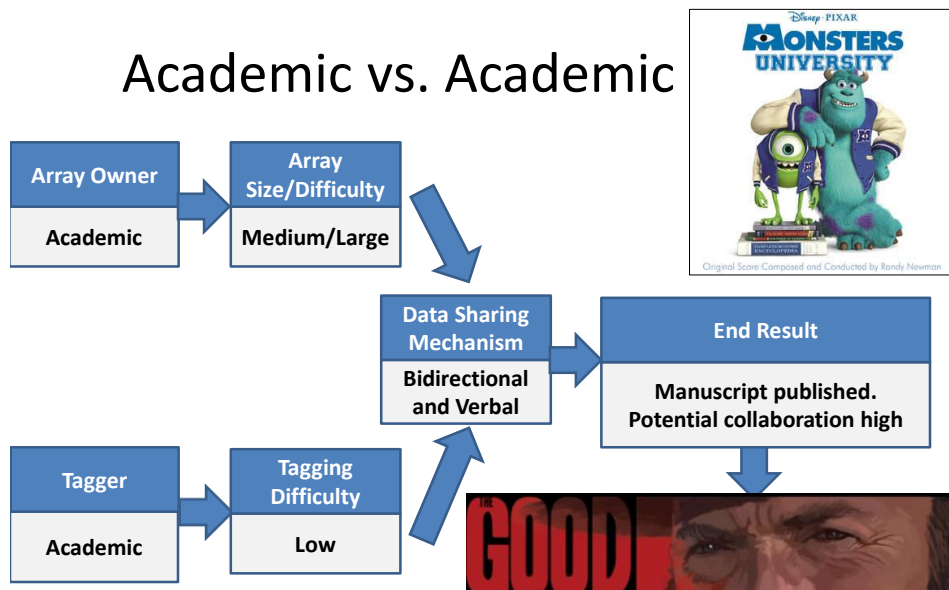
Consultant vs. Consultant



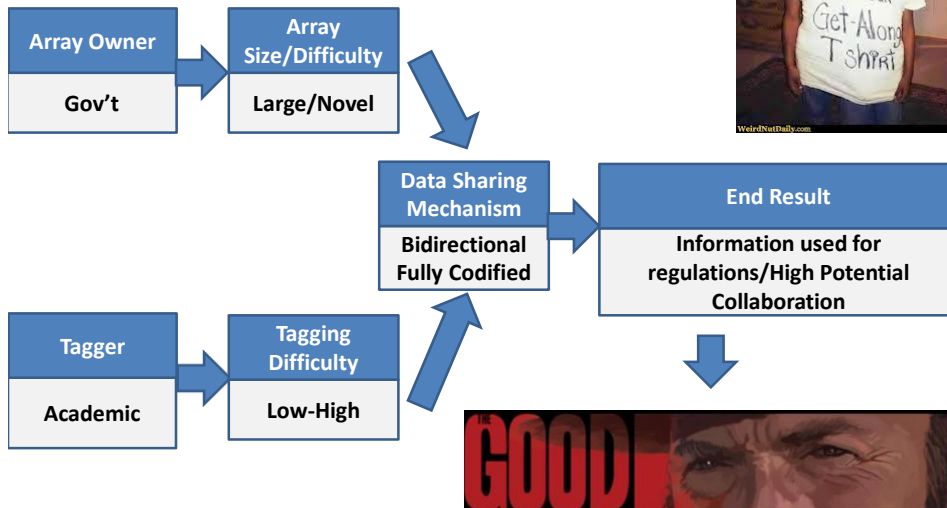
Academic vs. Academic



Academic vs. Academic



Gov't vs. Academic



Moving Forward



Know who are associating with and work out all conditions and terms first before "collaborating"

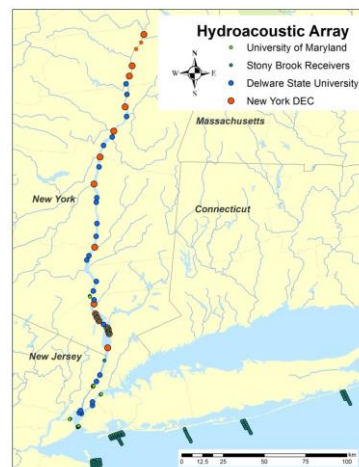
Next Steps....

- Defining rules of the road
 - Expectations on data use and access
 - Publications and cost sharing (EZ Pass model)
- AFS Policy Statement?
 - SDAFS Telemetry Sharing Workshop 2014
 - “But For” rule of thumb (Stephania Bolden)
 - General consensus- data belong to the tag owner



“Our Little Array”

- Dave Secor (UMD) original focus on Striped Bass (2008-2009)
- DSU’s original interest to examine DE and Hudson River exchange began in 2009
- DSU/NYSDEC working 2010-date
- SUNY Stony Brook joined 2012
- Acoustic receivers deployed seasonally on USCG ATONs



HR Array: What is out there?

NYSDEC	Alewife	American Shad	Atlantic Sturgeon	Blueback Herring	Shortnose Sturgeon	Total
# Tagged	13	174	103	12	64	366

Year	Number of Transmitters Heard*	Number of Transmitters Associated with a Researcher	Number of Species**	Number of Researchers**
2009	81	72	2	6
2010	189	172	5	11
2011	246	232	4	11
2012	429	386	7	13
2013	398	286	5	10
2014	443	342	4	13

* Greater than one detection
** Not including unknowns

Atlantic Sturgeon Life History

- Challenges
 - K selected species
 - Slow maturing
 - Long lived
 - Females spawn *infrequently* (estimates 3-5 years)
 - Management issues
 - 14 states jurisdictions
 - 5 Provincial jurisdictions
 - >95% of the adult lifespan is in marine waters



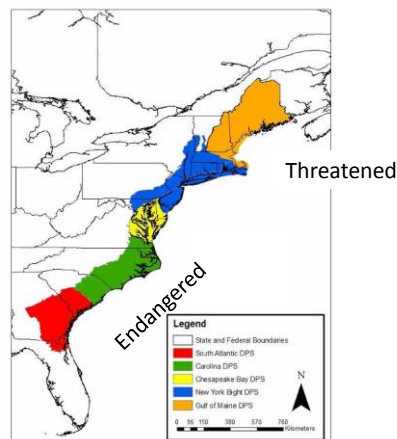
Atlantic Sturgeon Fishery

- Pre-1700s Leni Lenape Indians “celebrated the arrival of the sturgeon with an orgy of fishing”
- Late 1800s development of caviar fishery (DE River) at peak
 - 400 harvesters
 - 12-15 rail cars/d flesh
 - Up to 5 rail cars/d caviar
- Early 1900s-1980s primarily small in-river flesh fishery
- 1980s- coastal intercept fishery
 - Incidental development of monkfish gillnet fishery



Atlantic Sturgeon Management

- *Recent Management*
 - 1990 Fishery Management Plan for Atlantic Sturgeon
 - 1998 US coast wide moratorium
 - 2007 Status Review Team recommended listing
 - October 6th, 2011 ruling published
 - April 6th, 2012 ruling implemented



Status Review 2007

Who Cares About Uncharismatic Megafauna?



The estuary logo depicts an Atlantic Sturgeon, the Hudson's largest fish

Now for a tale of three "little ladies"



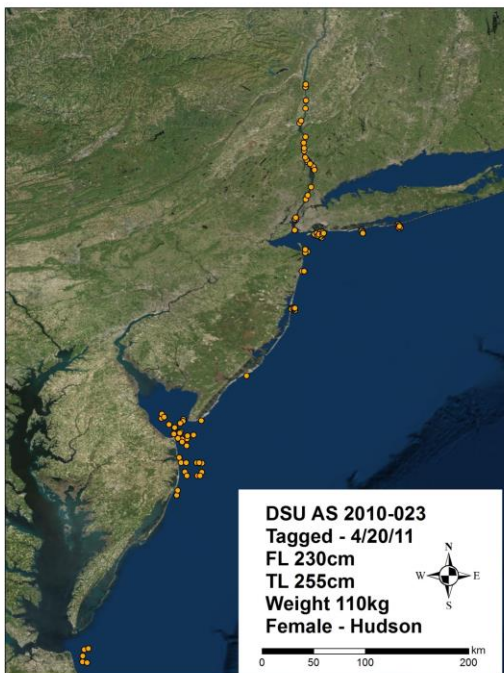


DSU AS 2010-023

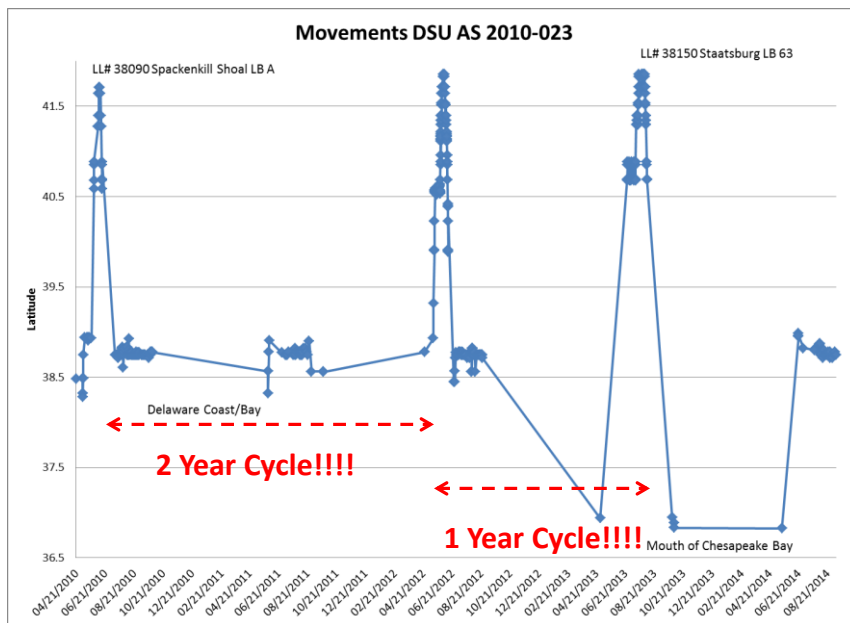
4/20/10

230FL - 255TL - 110kg

Ripe Female - Hudson



**Annual data from 2010-
2014 (tag still active)
ranging from VA-NY**

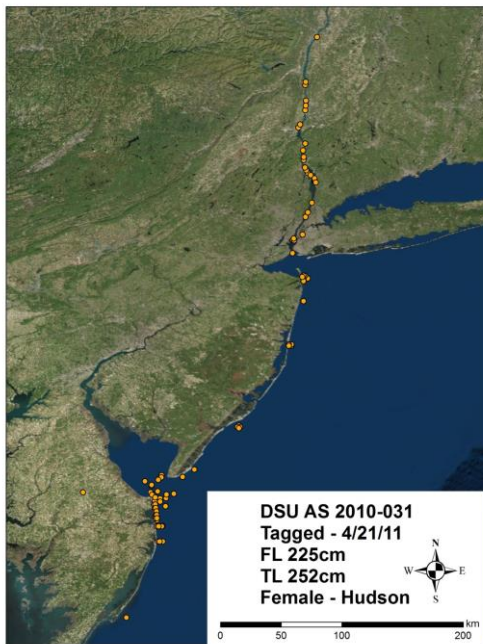


DSU AS 2010-031

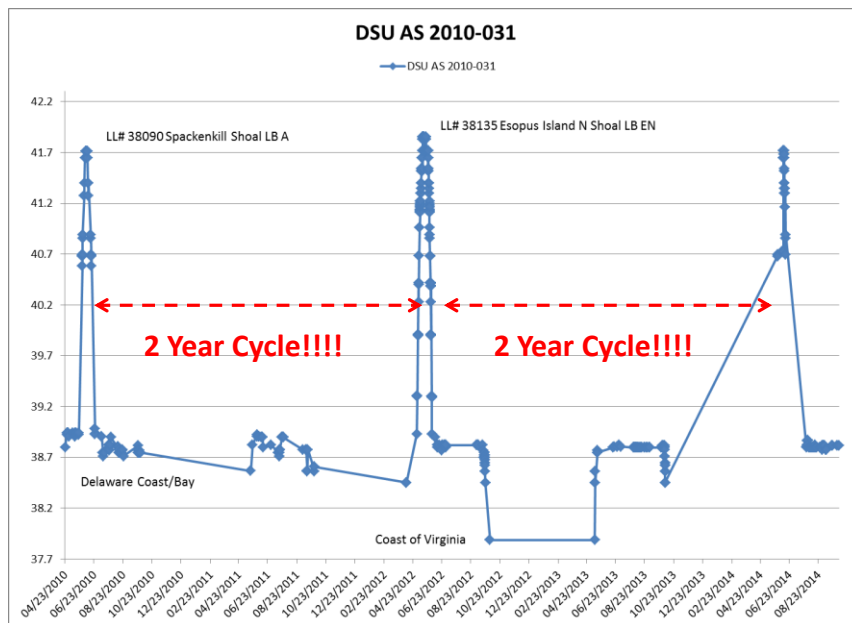
4/21/10

225FL - 252TL - No Weight

Ripe Female - Hudson



Annual data from
2010-2014 (tag still
active) ranging from
VA-NY



Future Directions

- Short term monitoring of sturgeon from Albany-NY to southern Delaware tagging
 - Earlier this year
 - Bound for
- Outreach/Education portal on the
- Linking tele
- Funding (A 015)



Continued Collaboration

