

# Chester River Watershed Observatory

Chester River Watershed Area	1010 Sq. Miles
Total Surface Water Area	85 Sq. Miles
Total Surface Water Shoreline	917 Miles
Primary Tributary Area	81 Sq. Miles
Primary Tributary Shoreline	498 Miles



= Proposed Obs Buoy



= Weather Station



= Water Quality

## The Chester River

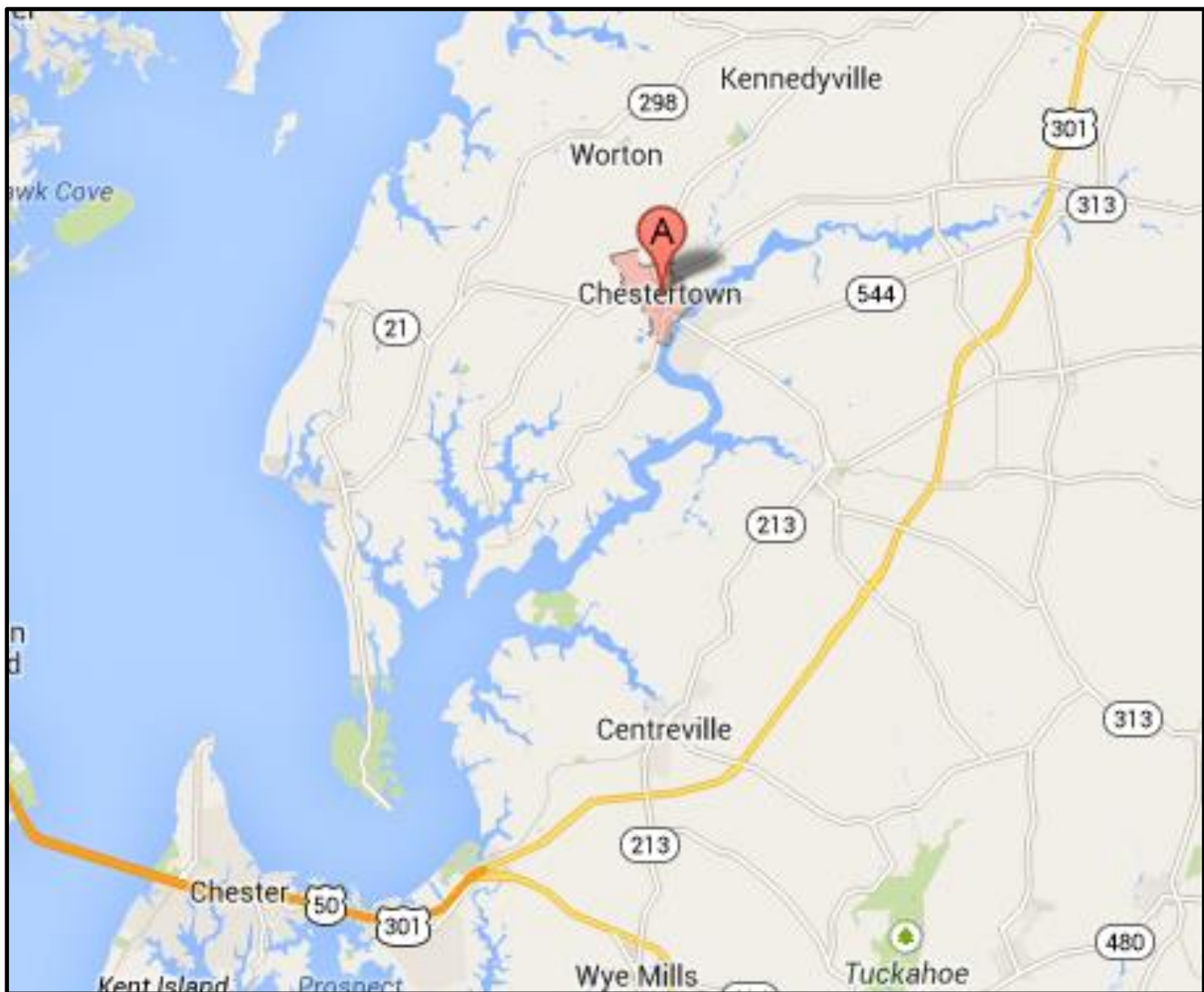
Best Understood River in the Country..  
*If not.. The world..*



Center for Environment & Society  
at Washington College









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## Doug Levin

■ PREMIUM

Deputy Director at Center for Environment and Society,  
Washington College

Chestertown, Maryland | Environmental Services

Current Washington College

Previous NOAA-IOOS, NOAA Chesapeake Bay Office,

Education Louisiana State University



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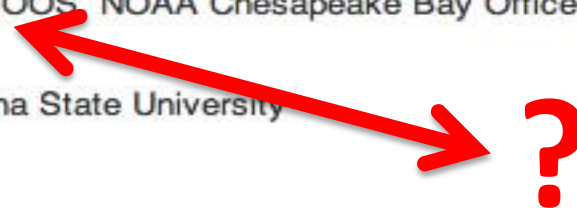
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# US IOOS Modeling Test Bed

## Testbed Management

**Doug Levin, IOOS**

Don Wright, Liz Smith,  
SURA

- \$4M - IOOS Program FFO  
(Programmatic Language)

- June 2010- June 2011;  
Extension Dec 11

21 members

Estuarine Hypoxia

Chesapeake Bay

Carl Friedrichs, VIMS

10 members

Testbed Advisory  
Evaluation Group

Rich Signell, USGS

- Multi-Agency involvement

- Goals:

- Less about the models  
than the process
- Process for Transition to  
Ops
- Enable Modeling and  
Analysis subsystem

24 members

Coastal Inundation

Gulf and East Coast

Rick Luettich, UNC-CH

25 members

Cyber Infrastructure

Eoin Howlett, ASA

20 members

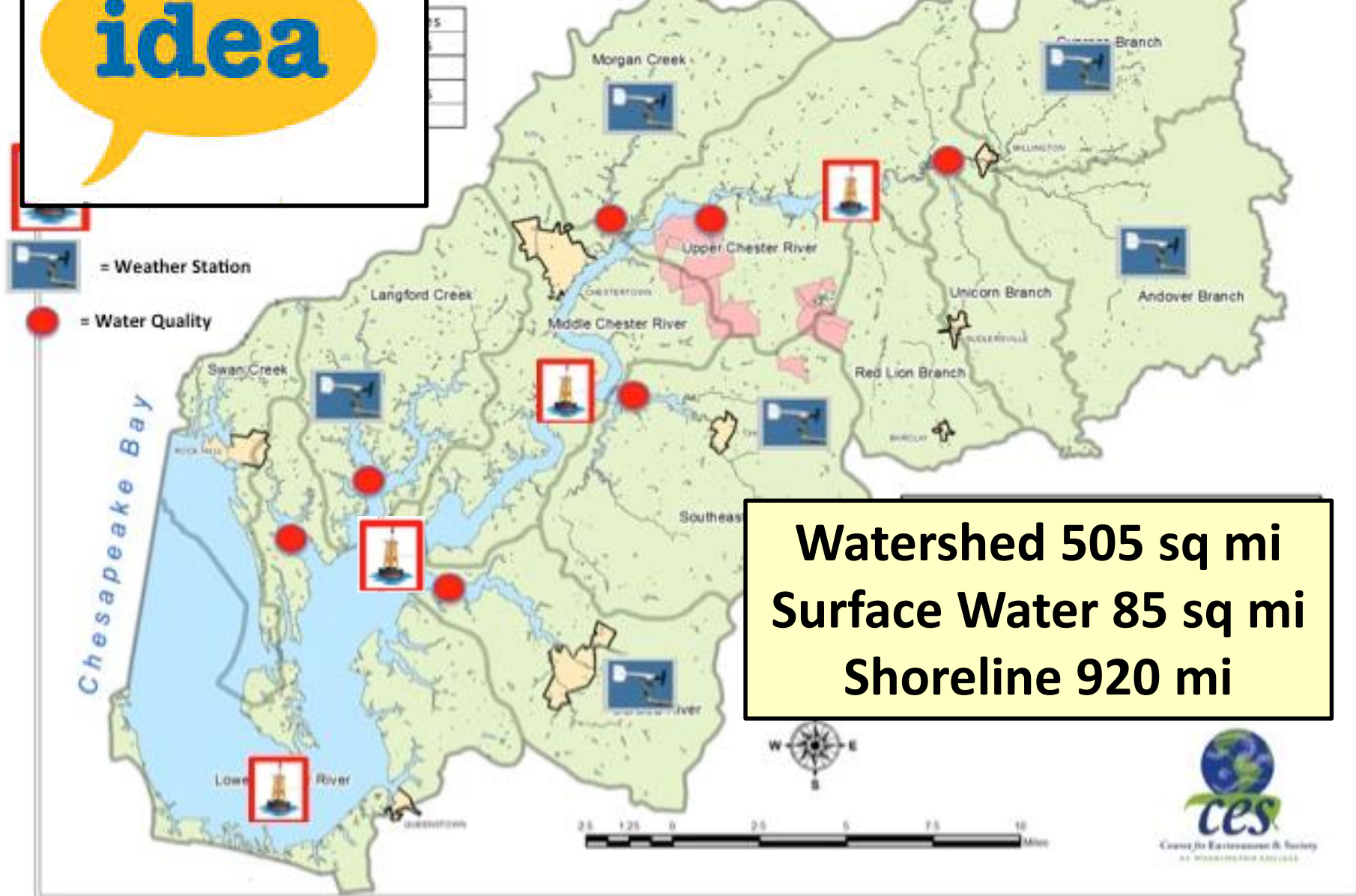
Shelf Hypoxia

Gulf of Mexico

John Harding, USM

idea

## Watershed Observatory





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# Washington College CES Capabilities To Support/Calibrate(?) the Modeling Effort

Geographic Information Systems Laboratory

Shallow Water Mapping System

Chester River Watershed Observatory (*Spring '15*)

- 5 Buoys, 4 Fixed Stations

- 5 Weather Stations

- 2 ADCPS & 1 *Current Meters*

NASA Radar Measurement of Precipitation

MARACOOS Data Portal

Data Fountain

CES/GIS

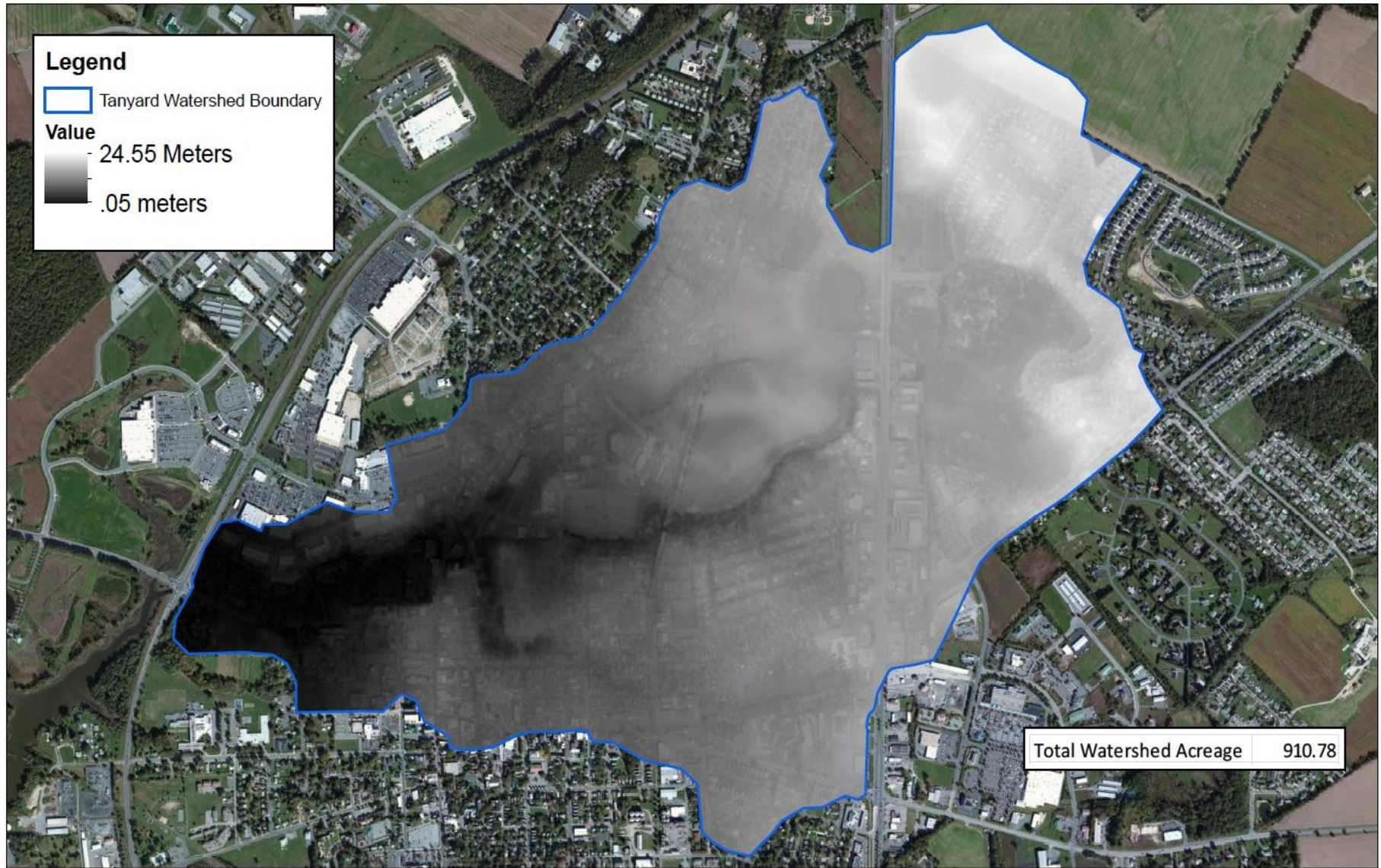


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# Tanyard Watershed Digital Elevation Model (Figure 2)

CES/GIS



Created By: Cara Murray  
October 2012

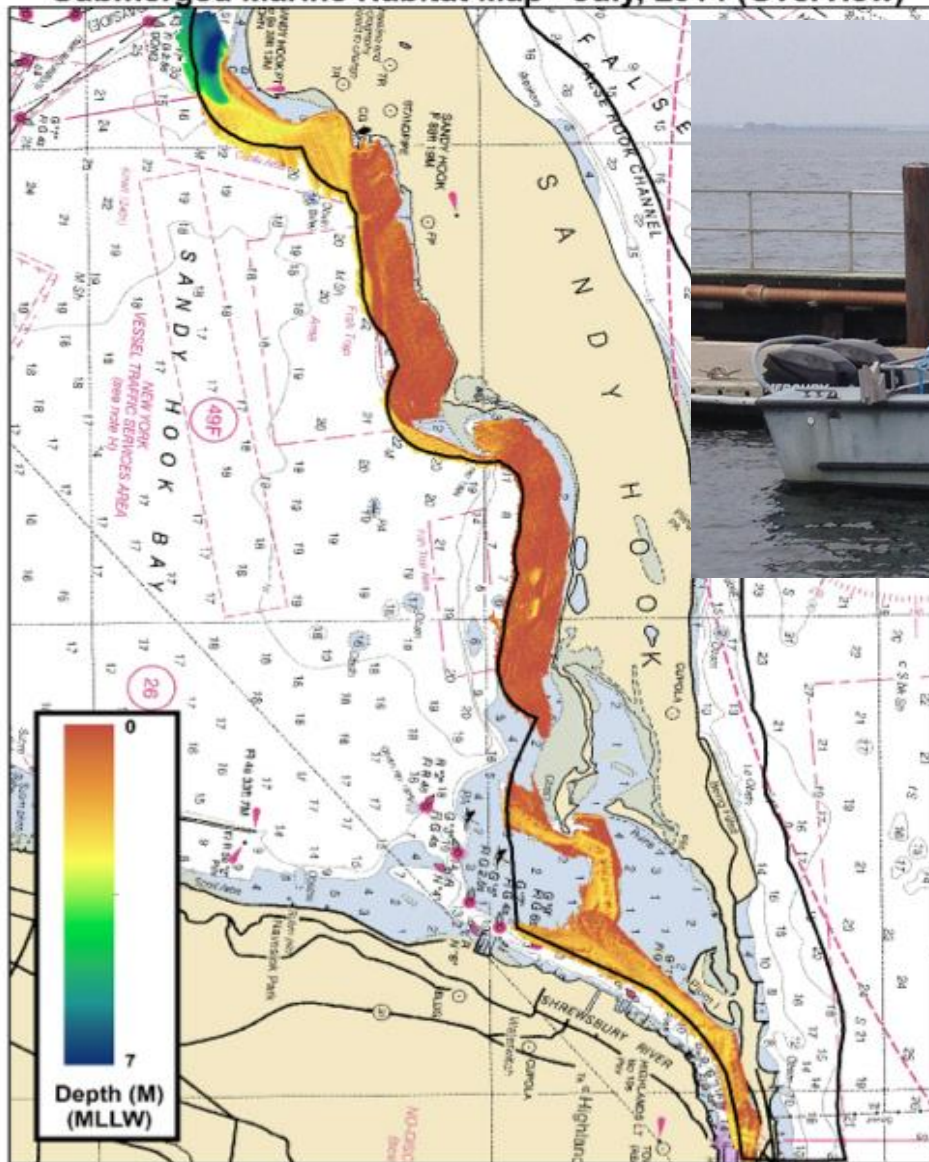
Data Source: 1/9 Arc Second DEM USGS (3 meter resolution, +/- 8 inch vertical accuracy)

0 0.125 0.25 0.5 Miles





# Sandy Hook Gateway National Recreation Area Submerged Marine Habitat Map - July, 2014 (Overview)



PI: Douglas R. Levin, Ph.D.  
Data: Washington College  
GIS Specialist: Grant Twilley





# The Chester River Watershed Observatory

What if you could ~~ask~~ answer any question?



# The Chester River Watershed Observatory



1. What happens to water quality when it rains?
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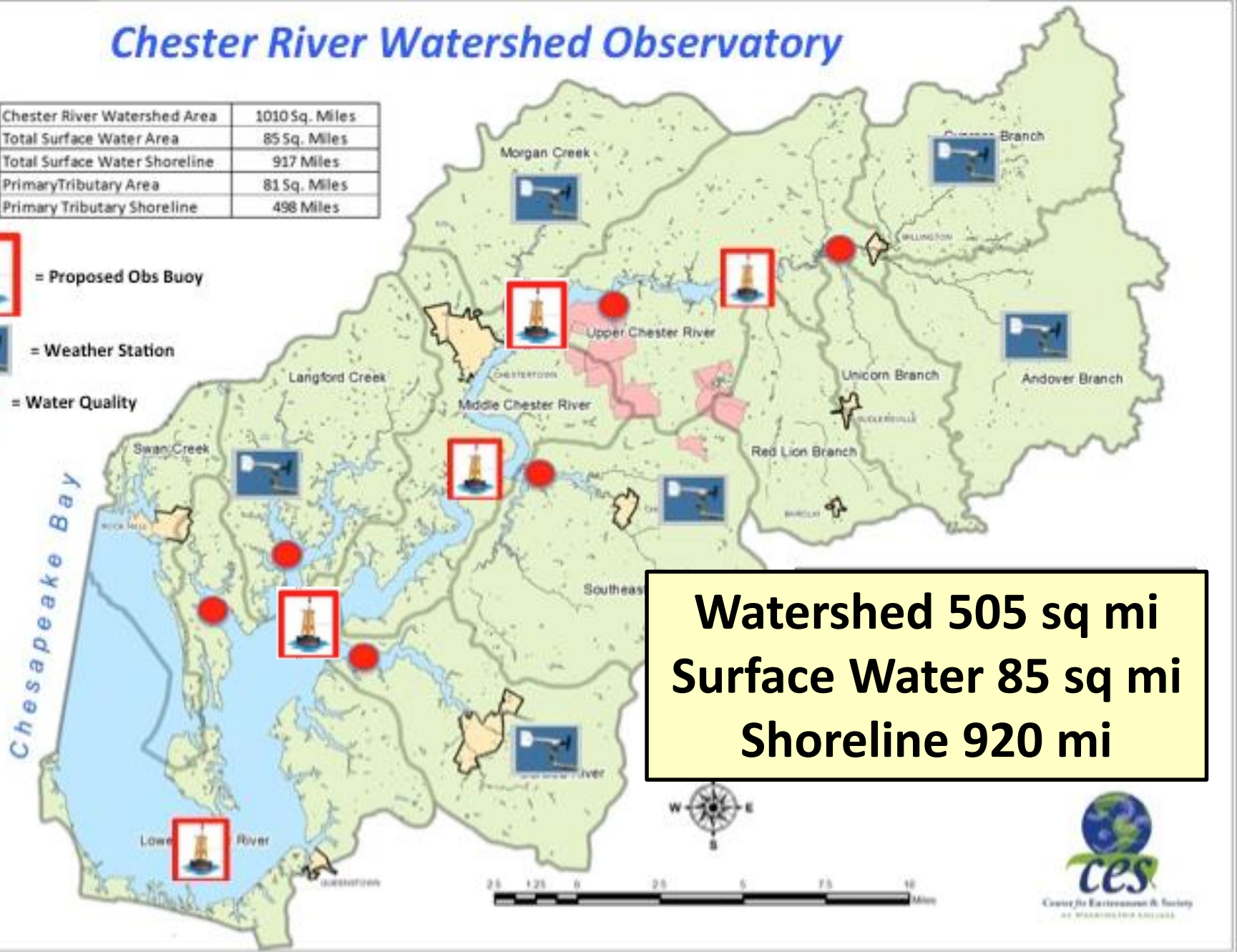
= Proposed Obs Buoy



= Weather Station



= Water Quality



**Watershed 505 sq mi**  
**Surface Water 85 sq mi**  
**Shoreline 920 mi**



Center for the Environment & Society  
AN INSTITUTE FOR SUSTAINABLE DEVELOPMENT

**OD**



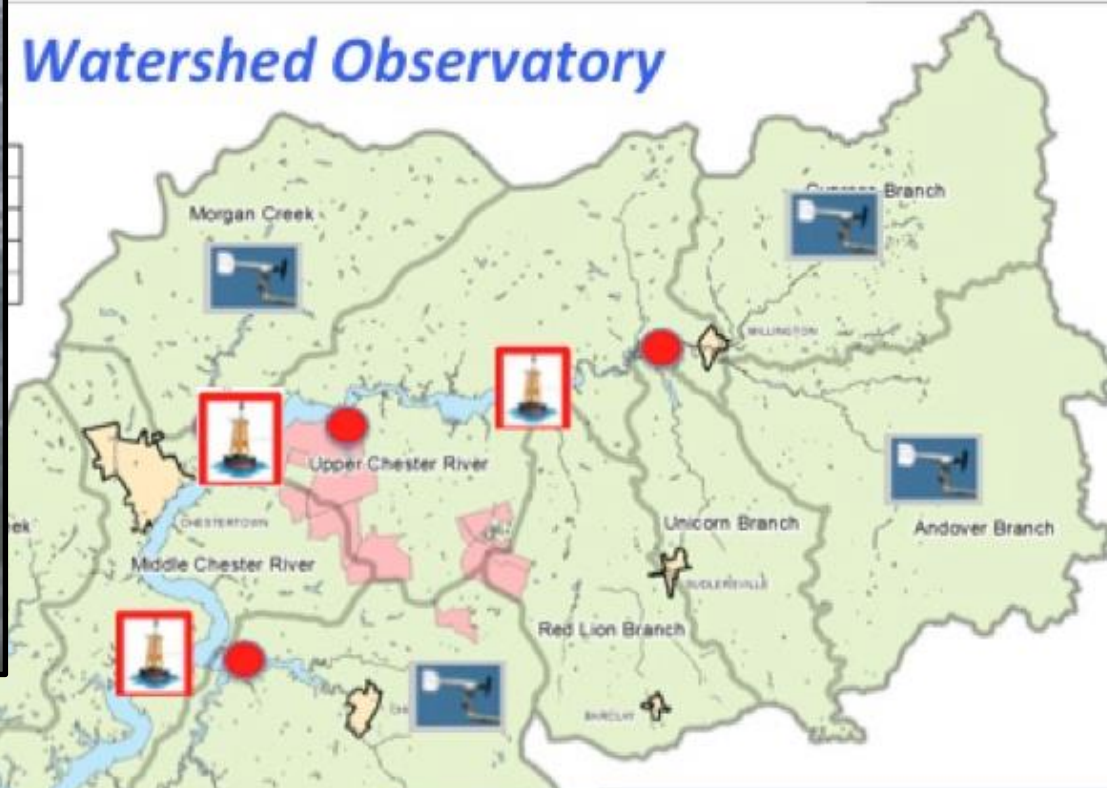
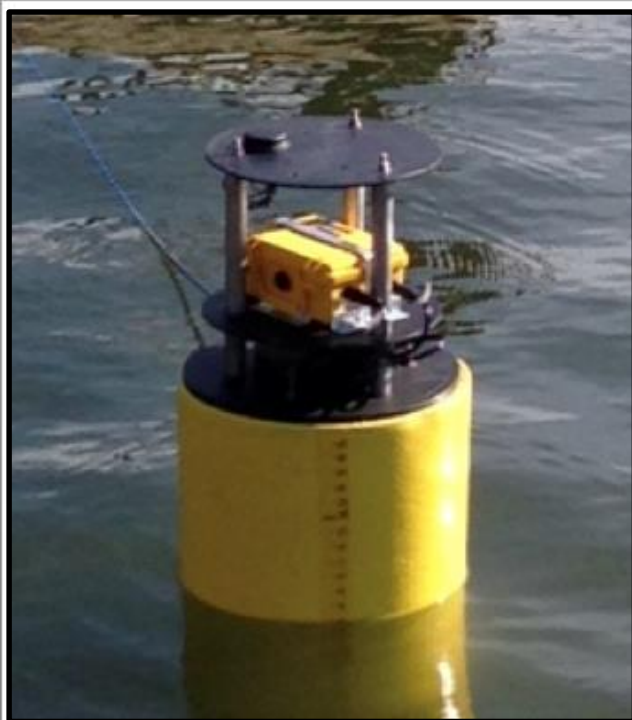
**Pro BOB \$10,000**



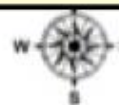
**Temp, Cond, Salinity, DO, Cond, Turb**



## Watershed Observatory



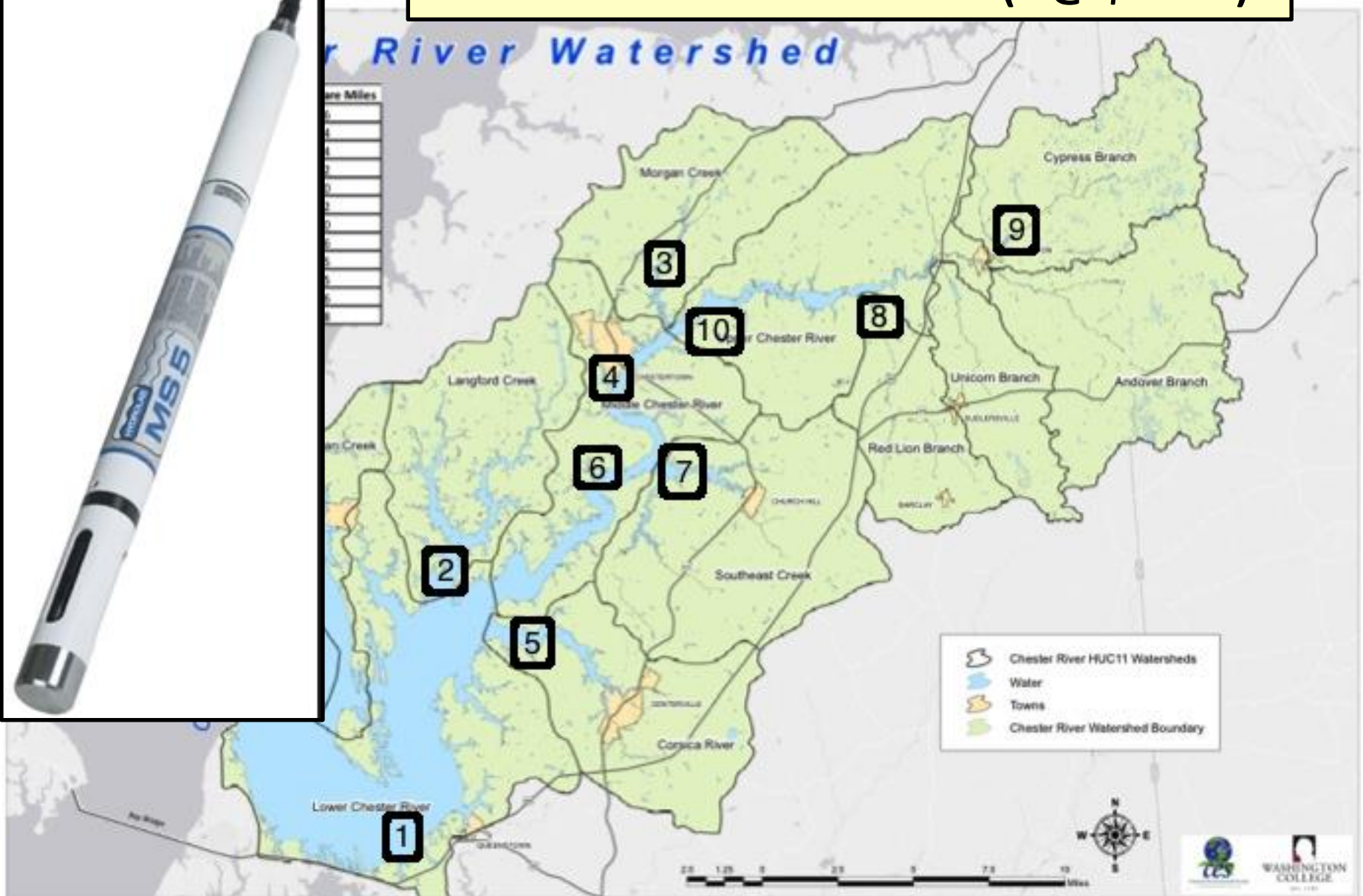
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## FLOs in the Sub-watersheds (4 @ \$6K ea)



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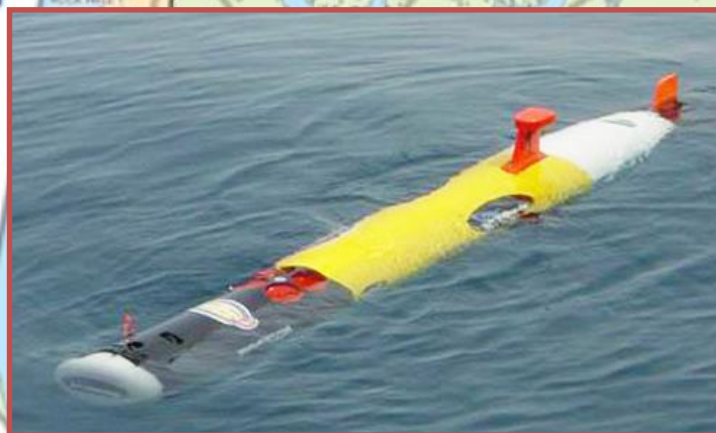
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Chesapeake Bay



Morgan Creek



Upper Chester

Langford Creek

Middle Chester River



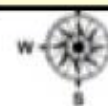
Swan Creek



Red Lion Branch

W  
Sur

Connecting  
the Dots



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# Microclimate in the Watershed From School Based Wx (6)

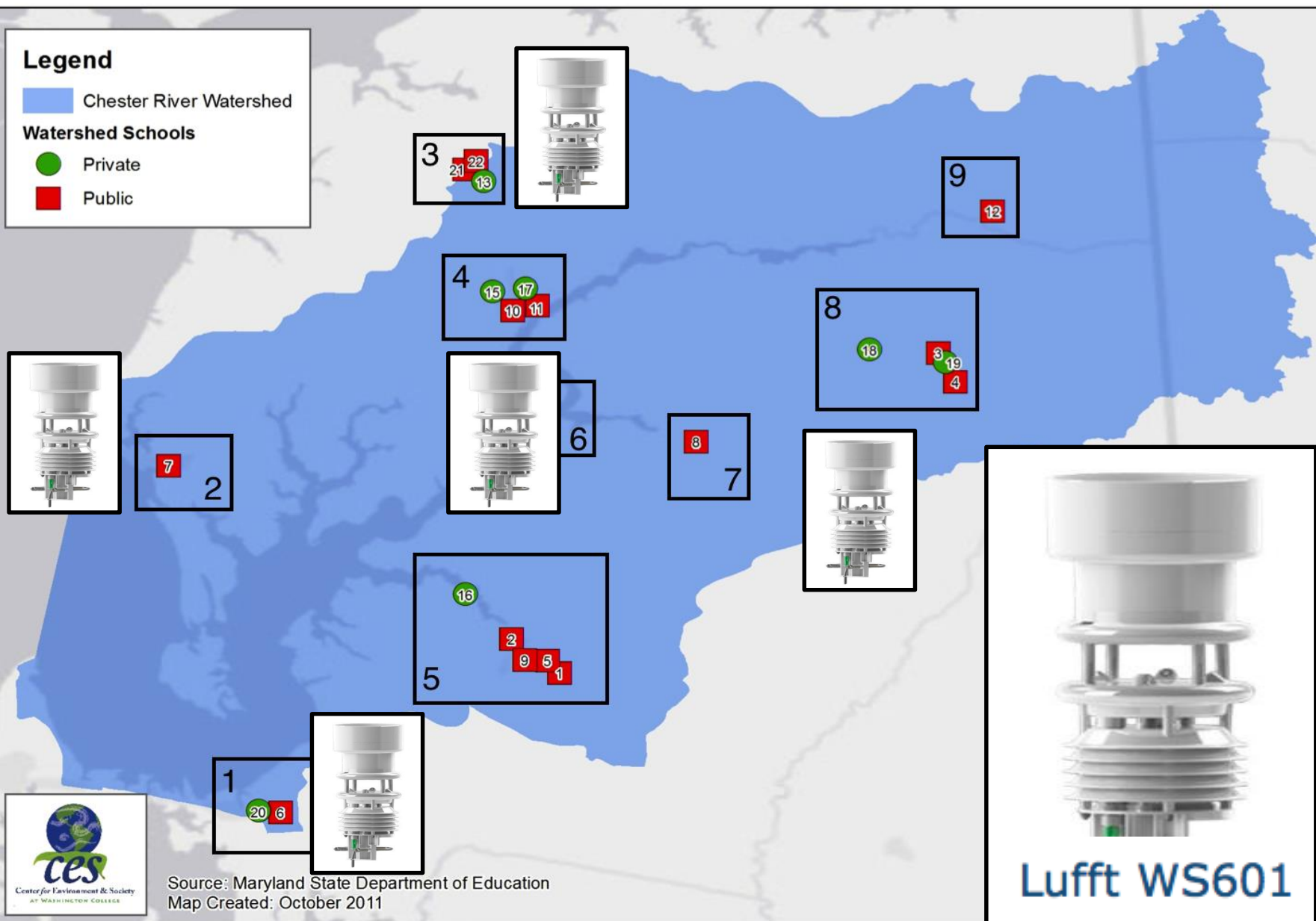
## Legend

 Chester River Watershed

## Watershed Schools

 Private

 Public



Lufft WS601





# PRECIPITATION MEASUREMENT MISSIONS

Home

GPM

TRMM

Science

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Education

## Resources

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GPM  
TRMM  
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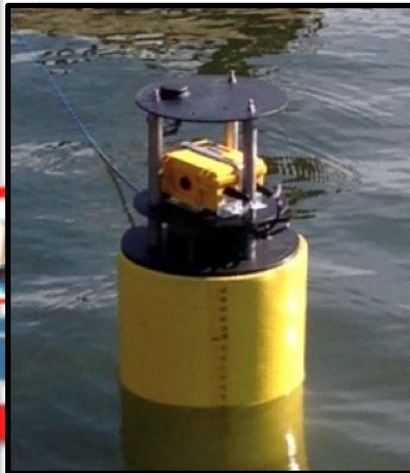
## D3R Radar Arrives at Wallops



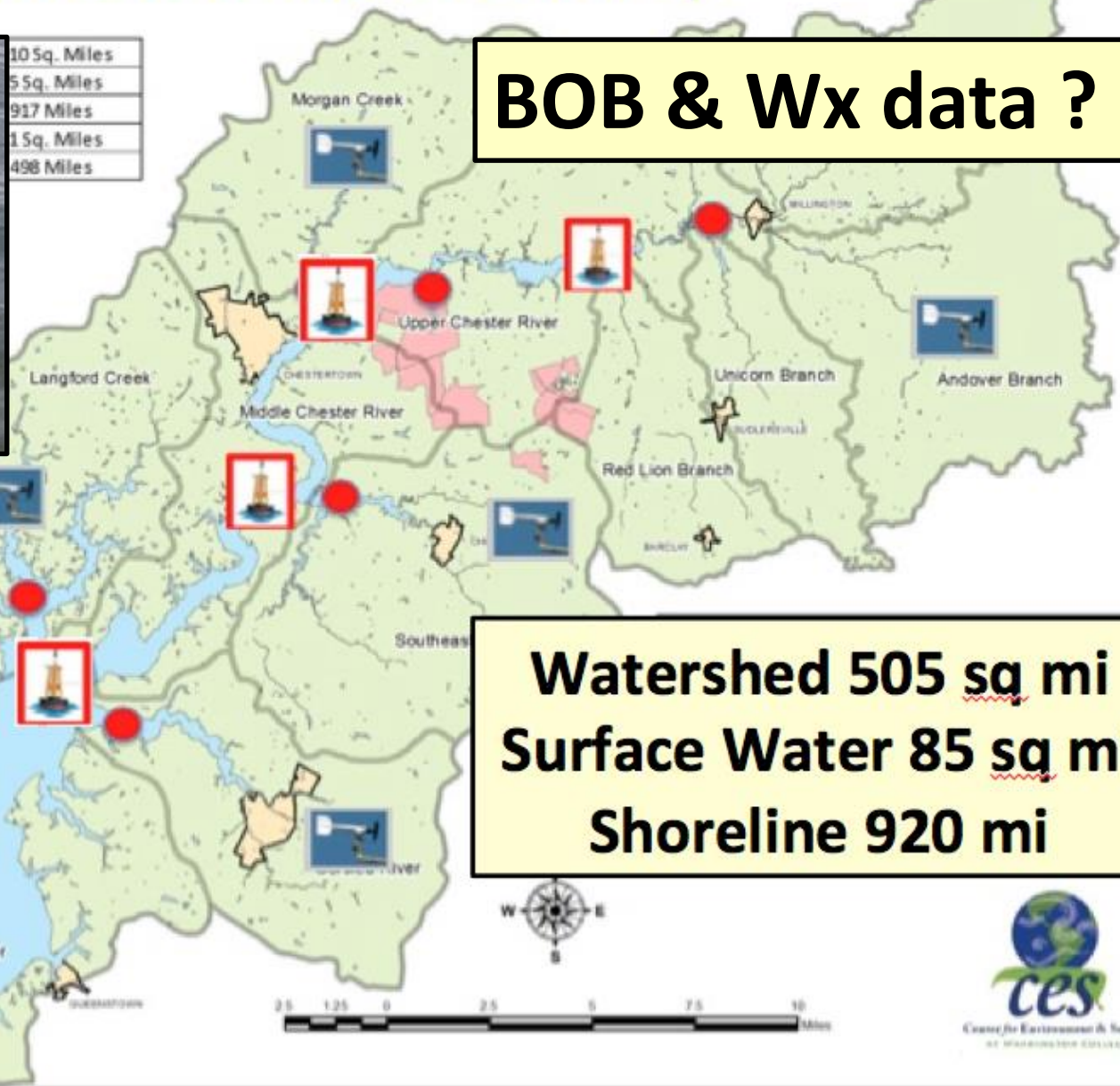
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**BOB & Wx data ?**

**Watershed 505 sq mi**  
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# MARACOOS

Ocean Information for a Changing World

Mid-Atlantic Regional Association Coastal Ocean Observing System

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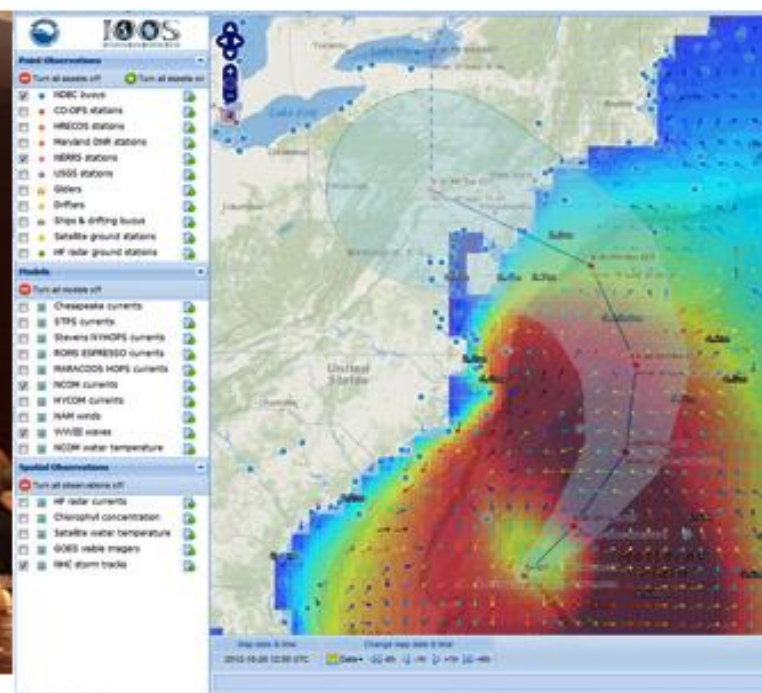
[Regional Real-Time Data Assets](#)



Slideshow Archive



**MARACOOS**  
Ocean Information for a Changing World



MARACOOS Interactive

MARACOOS HF Radar In

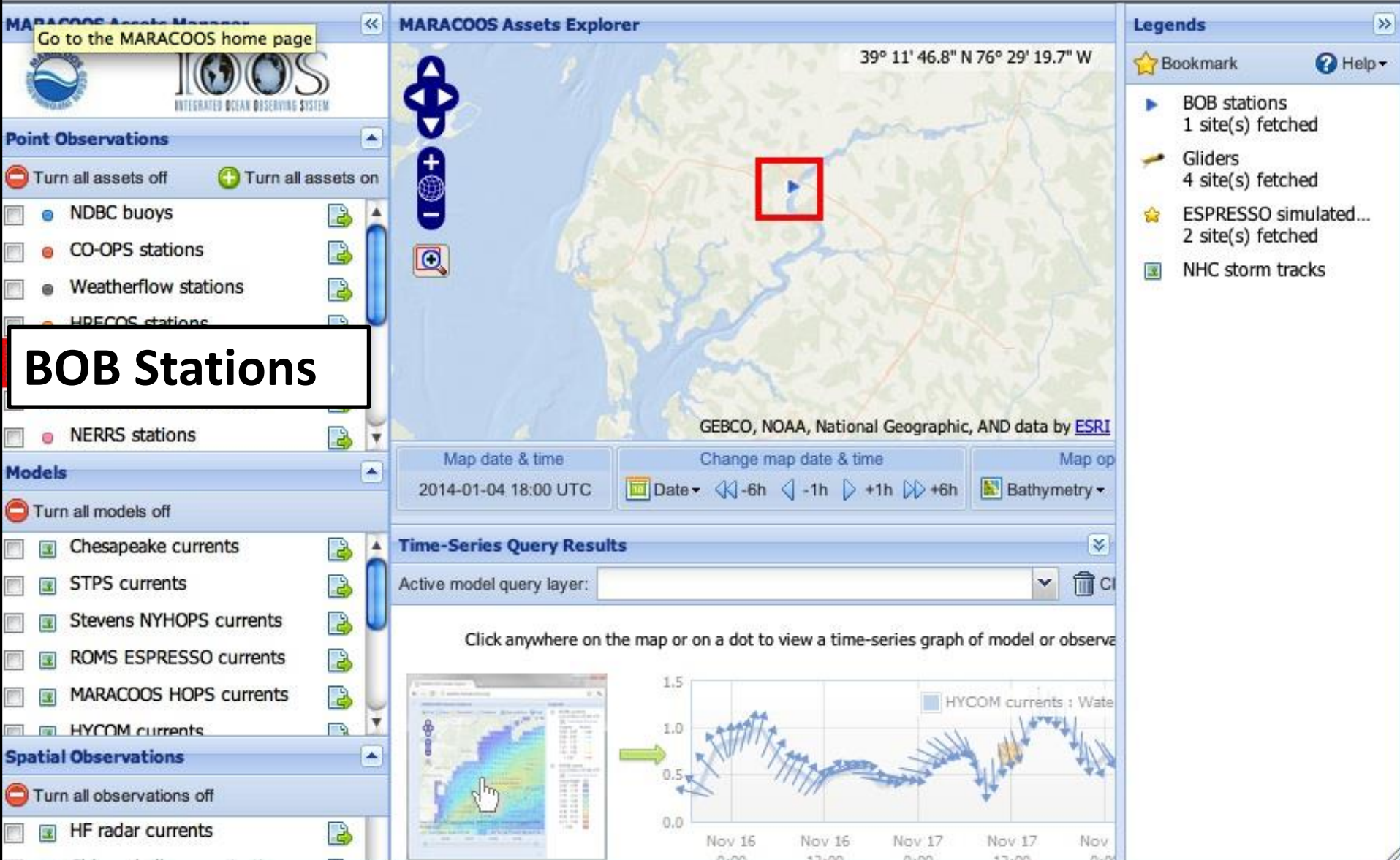
[MARACOOS Spotlight](#)

[New Regional Products](#)



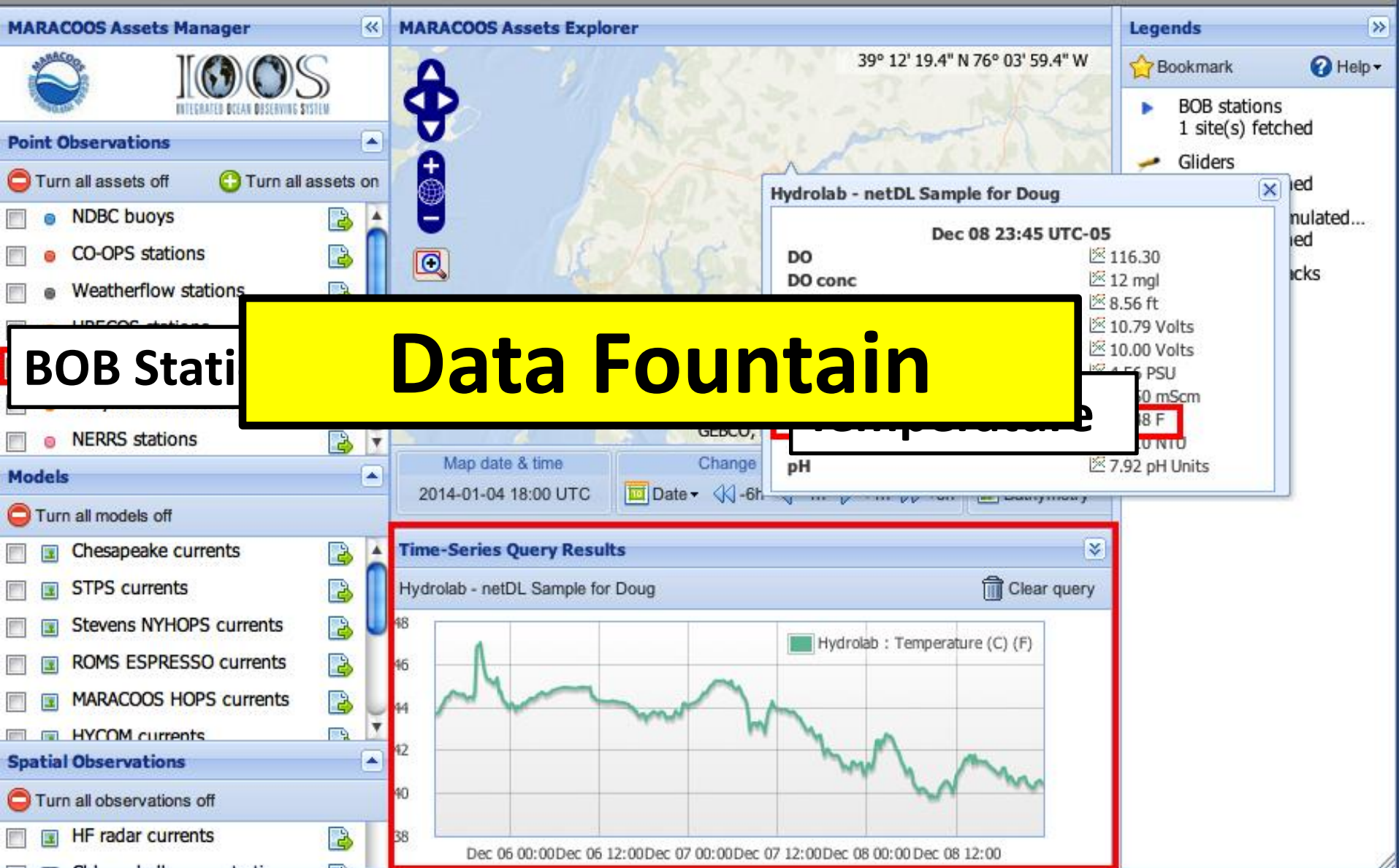


http://assets.maracoos.org



BOB Stations

<http://assets.maracoos.org>



BOB Station

Data Fountain

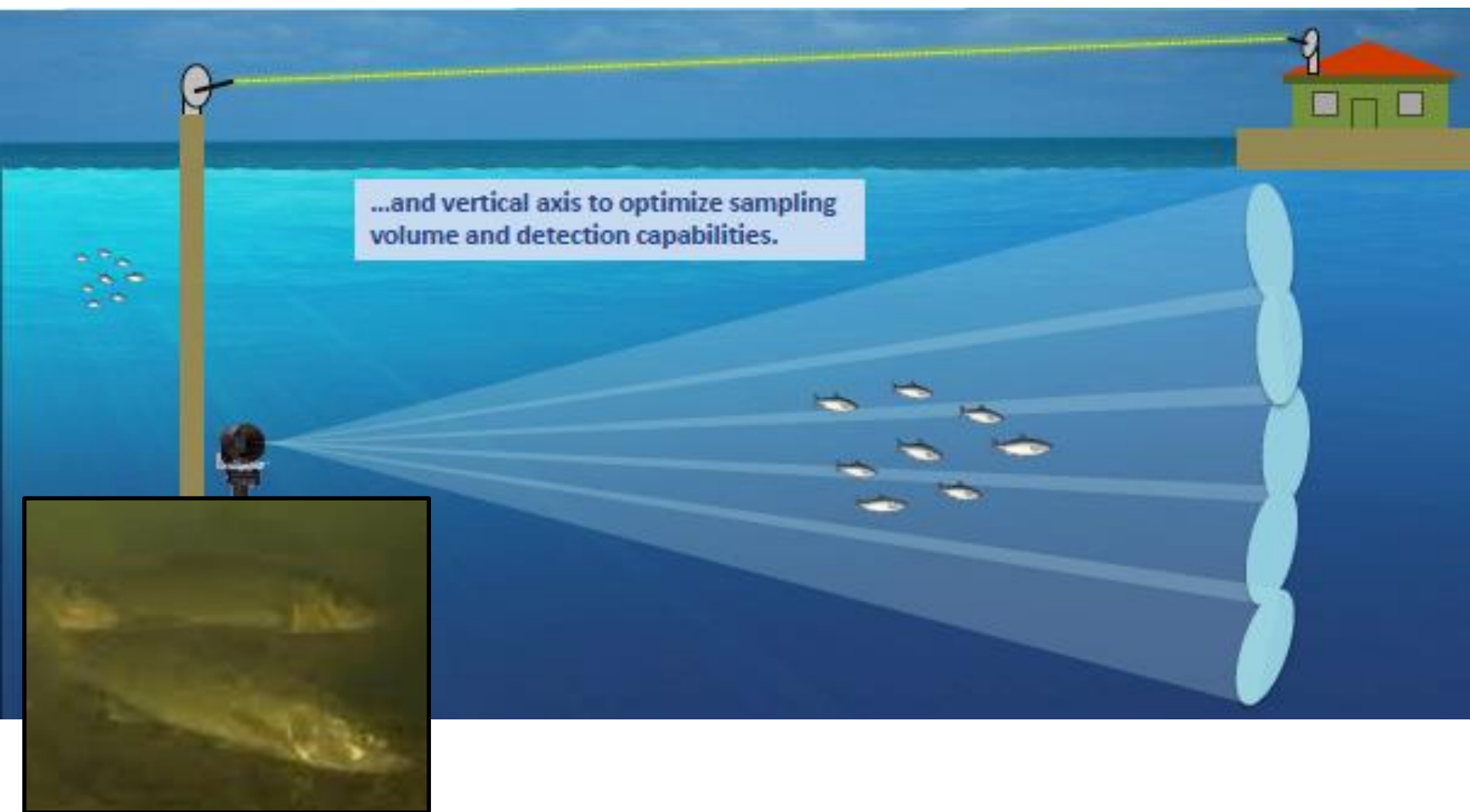
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# Tie Lesson Plans to Buoy Data? NOAA & MSDE

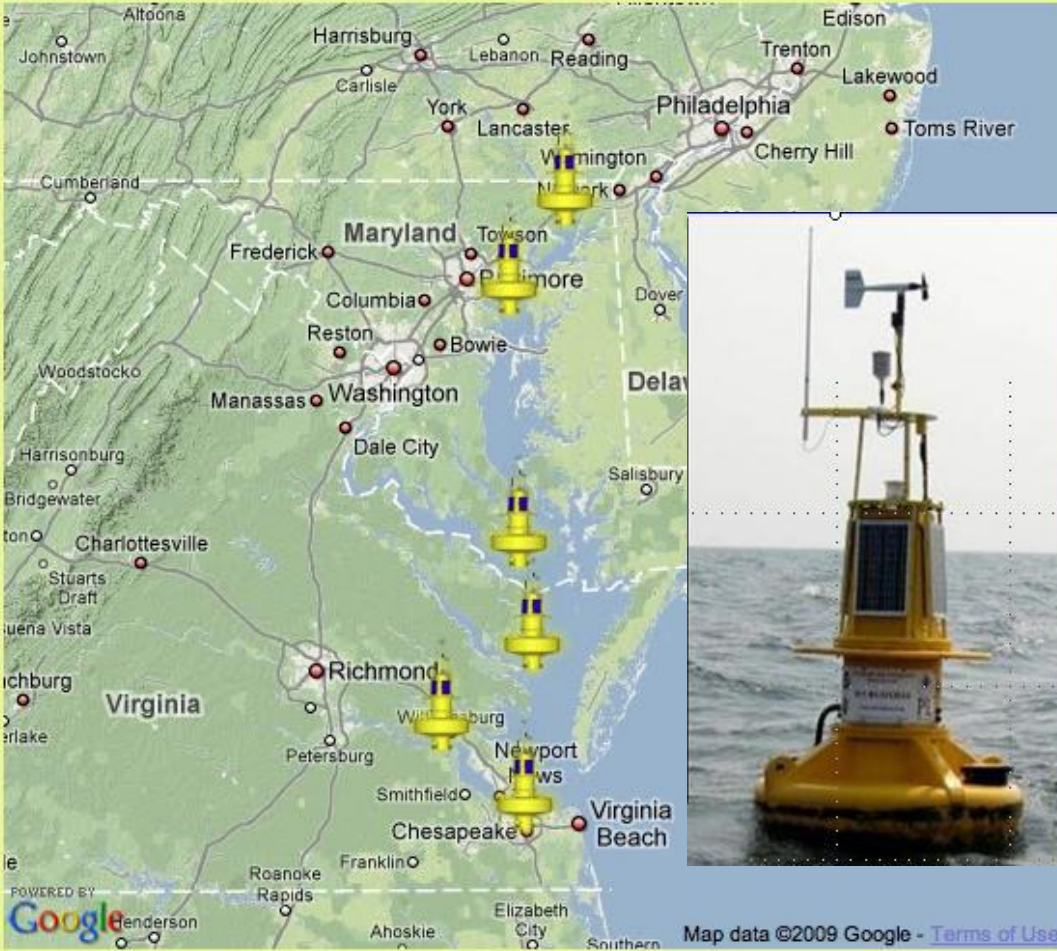


National Oceanic and Atmospheric Administration

## Chesapeake Bay Interpretive Buoy System

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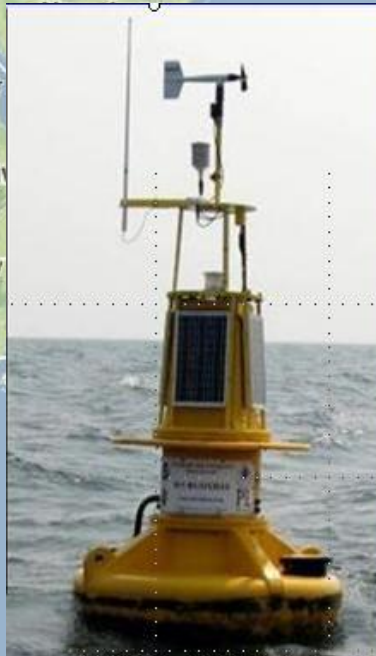
[What Is CBIBS?](#) | [Explore Buoy Data](#) | [Visit the Buoys](#) | [Buoys in the Classroom](#) | [Access Data/Metadata](#)



Map data ©2009 Google - [Terms of Use](#)

Click buoy images for more information

NOAA's Smart Buoys provide real-time weather and water observations and interpret locations along the [Captain John Smith Chesapeake National Historic Trail](#).



Map data ©2009 Google - [Terms of Use](#)

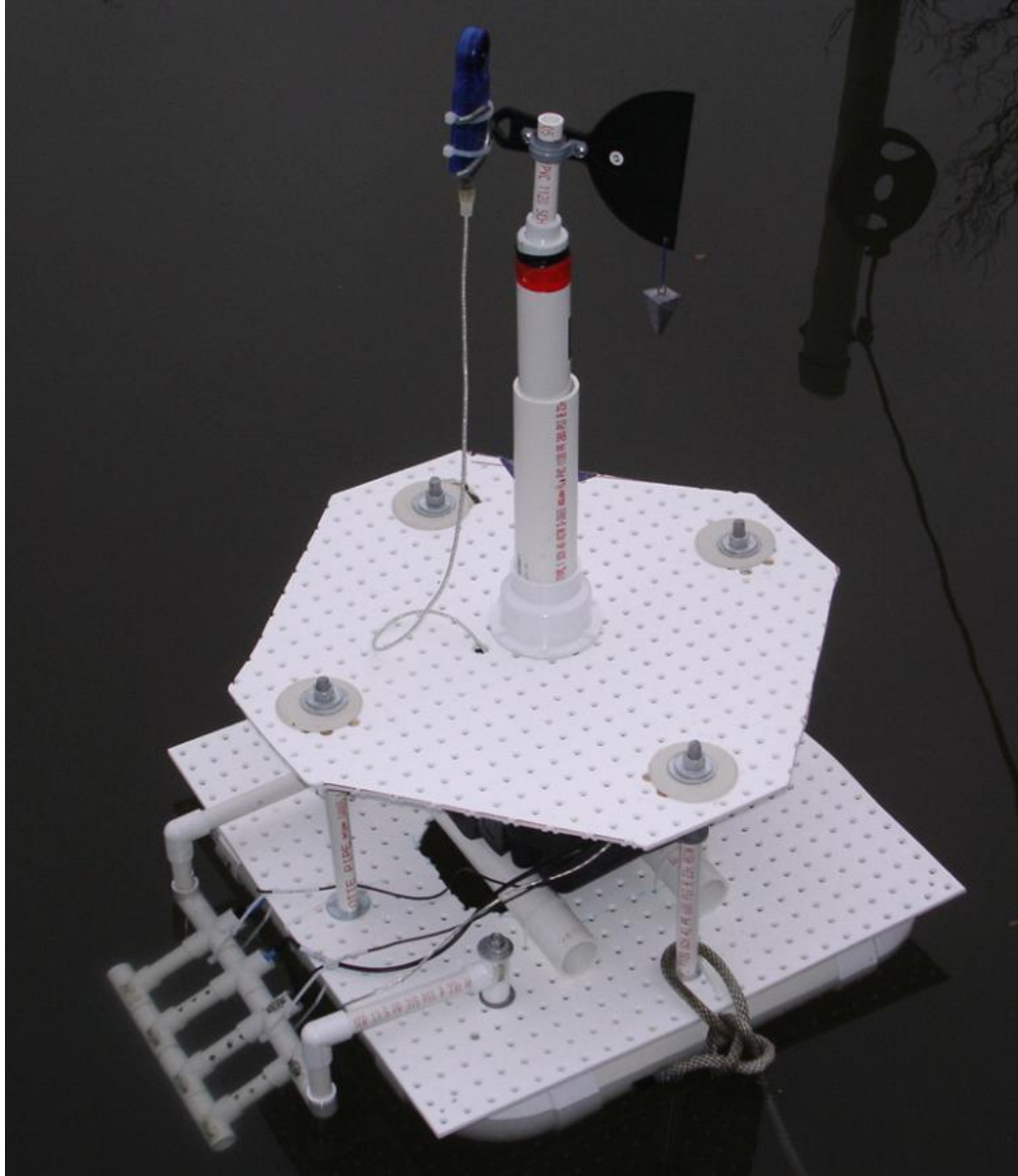
**Observe** [Interpret](#) [Patapsco](#)

Current Patapsco Buoy Conditions:

Air Temp: 79.0 F  
Wind Speed: 12.0 knots  
Wind Direction: 186.0  
Water Temp: 77.0 F  
Wave Height: 1.1 ft [Get more data](#)

deployed approximately 3/4 mile south of Greenbury Point in November 2009.

# Build it and they will Learn



**Air Temperature**  
**Water Temperature**  
**Conductivity (Salinity)**  
**Dissolved Oxygen**  
**pH**  
**Current Velocity**  
**Water Level**  
**More.....**  
**Turbidity & Light**  
**Nutrients**



# Build a Buoy



Chapel District Kindergarten, Church Hill Middle School & the Kent School

# The Chester River Watershed Observatory



**Doug Levin Washington College CES**

**[dlevin2@washcoll.edu](mailto:dlevin2@washcoll.edu)**

**Doug Wilson Caribbean Winds LLC/MARACOOS**

