



Opportunities for Collaboration: Select Data Needs for the Chesapeake Bay Program Partnership

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2014 Chesapeake Watershed Agreement

Goals and Outcomes: Indicator Information Needs



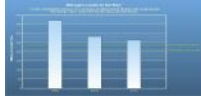
Sustainable Fisheries

- Blue Crab Abundance
- Blue Crab Management
- Oyster
- Forage Fish
- Fish Habitat



Vital Habitats Goal

- Wetlands
- Black Duck
- Stream Health
- Brook Trout
- Fish Passage
- Submerged Aquatic Vegetation (SAV)
- Forest Buffer
- Tree Canopy



Water Quality Goal

- 2017 Watershed Implementation Plans (WIP)
- 2025 WIP
- Water Quality Standards Attainment and Monitoring



Toxic Contaminants Goal

- Toxic Contaminants Research
- Toxic Contaminants Policy and Prevention



Healthy Watersheds Goal

- Healthy Waters



Stewardship Goal

- Citizen Stewardship
- Local Leadership
- Diversity



Land Conservation Goal

- Protected Lands
- Land Use Methods and Metrics Development
- Land Use Options Evaluation



Public Access Goal

- Public Access Site Development



Environmental Literacy Goal

- Student
- Sustainable Schools
- Environmental Literacy Planning

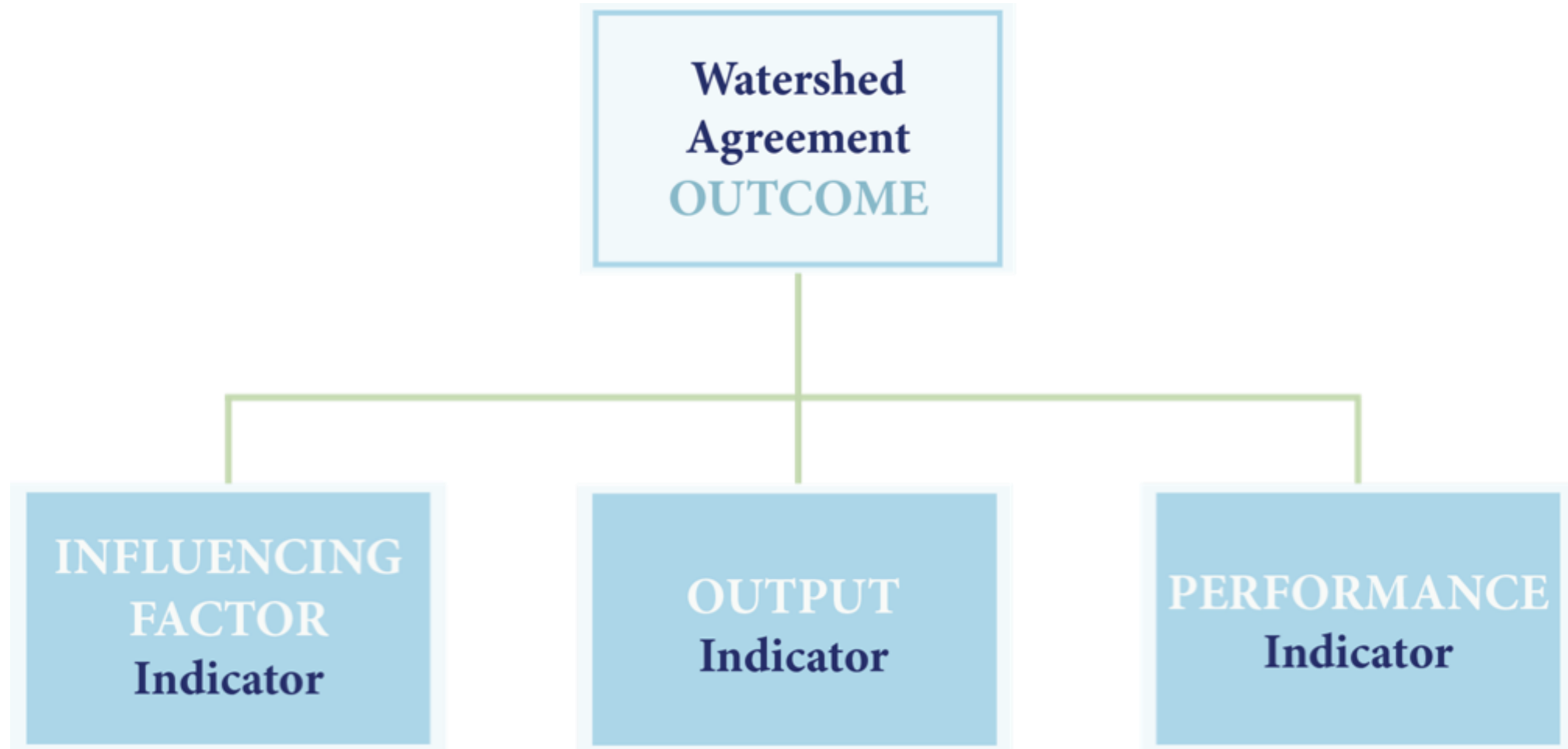


Climate Resiliency Goal

- Monitoring and Assessment
- Adaptation Outcome

Links with data needs

There are more than the Outcome Indicator data needs...



Data needs:

- Spatial coverage: Local scale assessments to regional scale coverage
- Spatial resolution: desirable = as small as can be provided (e.g. 1m x 1m), however, it really depends on the indicator need.
- Temporal coverage: Consistent data collection programming through time with reliable support.
- Temporal resolution: indicator dependent again. Many seasonal to annual scale data interests (needing multiple data points within a season or over the year) but something like harmful algal bloom tracking or flooding could be daily to weekly.

Catalogue of Outcome Indicator Needs at CBP.

August 2018 Status

Indicators in Good Standing	Indicator in Development	Research in Progress	Indicator in Refinement	No Defined Indicator at this Time
<ul style="list-style-type: none">• Blue Crab Abundance & Management• Oyster• Wetlands Restored on Agricultural Lands• Fish Passage• SAV• Forest Buffer• 2017 Watershed Implementation Plans (WIPs)• 2025 WIPs• Water Quality Standards Attainment• Diversity• Protected Lands• Public Access• Sustainable Schools• Environmental Literacy Planning• Student MWEES• Citizen Stewardship• Toxic Contaminants Policy and Prevention	<ul style="list-style-type: none">• Local Leadership• Climate Resiliency• Tree Canopy	<ul style="list-style-type: none">• Forage Fish• Healthy Watersheds	<ul style="list-style-type: none">• Black Duck• Brook Trout• Stream Health	<ul style="list-style-type: none">• Fish Habitat• Toxic Contaminants Research• Land Use Methods and Metrics Development• Land Use Options

Source: Laura Drescher, CBP Status and Trends Workgroup Coordinator, August 2018.

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OPPORTUNITIES: 2017/18 Catalogue of Potential Climate Change Indicators.
 CBP-Community generated list of **124 potential variables** to track ecosystem change and use to help explain factors influencing management progress.

Chesapeake Climate Change Indicators: Potential Indicator Topics					
Updated June 29, 2017					
This is a "living" list. It's not fully fleshed out yet. Over time, we will fill in more information about data availability and quality, then use this file to gather feedback and focus on					
BASIC INFORMATION					
ID#	Variable(s)	Initial notes	Type of indicator	"Top 10" votes (Select 10 indicators from each bin (physical, ecological impact and progress))	
117	200	state healthy watersheds acreage	3-Progress toward resilience	0	
118	201	stream restoration projects, including natural floodplains or detention areas	3-Progress toward resilience	3	
119	203	surface water supplies vis-à-vis salt line migration in tidal rivers	and adaptation: managing freshwater inputs to keep the salt line safely downstream 3-Progress toward resilience	0	
120	205	tree canopy (urban)	3-Progress toward resilience	2	
121	207	water quality standard attainment of tidal Chesapeake Bay	3-Progress toward resilience	3	
122	208	wetland accretion rates vis-à-vis sea-level rise	3-Progress toward resilience	3	
123	209	wetland fragmentation; other habitat fragmentation	something analogous to EPA ROE forest fragmentation indicator, based on contiguous pixels of the same land cover type... enough precision in NLCD data? 3-Progress toward resilience	4	
124	211	wetland restoration	could specifically highlight wetlands restored on ag lands 3-Progress toward resilience	8	
125					
126					

Indicator Development Status at a Glance

Topic	Type of indicator	Stage 1: Indicator and metric(s) defined	Stage 2: Data collection program in place	Stage 3: Methods selected to transform data into an indicator	Stage 4: Data processed	Stage 5: Indicator developed for the Chesapeake
Group A: Chesapeake indicator already exists						
Protected Lands	Resilience or response	✓	✓	✓	✓	✓
Restored Habitat	Resilience or response	✓	✓	✓	✓	✓
Group B: Existing national indicator just needs to be clipped or cropped						
Air Temperature	Physical stressors	✓	✓	✓	✓	
Coastal Flooding	Impacts	✓	✓	✓	✓	
Precipitation	Physical stressors	✓	✓	✓	✓	
Sea Level Change	Physical stressors	✓	✓	✓	✓	
Stream Water Temperature	Physical stressors	✓	partial	✓	✓	
Upstream Flooding	Impacts	✓	✓	✓	✓	
Group C: Indicator defined, but need to process data and develop indicator						
Acidification	Physical stressors	✓	✓			
Bay Water Temperature	Physical stressors	✓	✓	partial		
Harmful Algal Blooms	Impacts	✓	✓	✓	partial	partial
Property at Risk or Damaged	Impacts	partial	✓			
Urban Tree Canopy	Resilience or response	✓	✓			
Wetland Extent and Physical Buffering Capacity	Impacts	✓	partial	partial		
Group D: Data likely exist, but need to define and develop indicator						
Bird Species Ranges	Impacts		✓			
BMPs and Green Infrastructure	Resilience or response					
Land Use/Land Cover	Resilience or response		✓			
Shoreline Condition	Resilience or response		✓			
Wetland Migration Corridors	Resilience or response		✓			
Group E: Could require a new data collection program						
Fish Population Distribution	Impacts / resilience or response					
Submerged Aquatic Vegetation Composition	Impacts / resilience or response					

Accomplished:

Among the top 21 climate change variables considered priority, 7-8 are about ready for prime time display and use as Chesapeake Bay indicators.

*Indicator implementation plans are available for the 13-14 other priority variables.

Opportunities for discussion:

That leaves us about 116-117 variables to consider if there is a way to fulfill data needs through a consistent assessment program providing information supporting a related indicator.

First cut opportunities of the remaining 117 variables that could be elevated in priority for development in the CBP if appropriate assessment and reporting data are available

- Light availability/cloudiness
- Sediment inputs
- Timing of ice formation/ice out
- Wildfire frequency, area
- Flooding
- Change in traffic patterns in response to flooding
- Harmful algal blooms
- Living vs hardened shoreline
- Land use
- Forest/riparian buffers
- Ghost forests/salt line migration
- Water clarity – water quality standards
- Bay/stream temperatures
- Invasive species (plants)
- Wetlands – extent, condition, change, fragmentation, etc.

GIT

GIT Needs from STAR

Completed Y/N

STAR workgroup

WQ Criteria Attainment patterns summary

Y

2018 manuscript

Update in patterns in WQ standards attainment DO, clarity/SAV and chlorophyll

Y

Publish WQ Criteria Tech Addendum

Published 2017

CAP WG

Implement new process to quantify trends in tidal WQ parameters

yes, paper being completed

Integrated Trends and Analysis Team (ITAT)

WQ results attained from 2 of 6 high flow events for mid point assessment

yes, extended into 2017

DNR/UMCES/USGS

Monitor high flow events at Conowingo

yes, extended into 2017

DNR/UMCES/USGS

Conowingo impacts on WQ monitoring plans

DNR set up study

ITAT

125 sites of nutrient and sediment samples

Y

IMN WG needed to maintain network

Update loads and Trends USGS

Y

USGS to update reporting/communicating of loads to Bay

Y (2016); in progress for 17

ITAT/USGS

expand on BEI report for add'l monitoring needs

Will use this process

Incorporate Citizen Science Monitoring for WQ standards

In progress

Criteria Assessment Protocol WG

develop targeted shallow water monitoring strategy

IN progress

Integrated Monitoring Networks WG

Test watershed factors

Water Quality influencing WQ trends in tidal waters

In progress, 2018

ITAT

Release report/communication of nitrogen sources

Synthesis report, 2018

ITAT

Compare observed and expected trends in watershed

Synthesis report, 2018

ITAT

Improve knowledge of sed and N sources

Synthesis report, 2018

ITAT

Use WQ data to assess PA's progress

Ongoing

Modeling WG

WQ functions of wetlands

Synthesis report, 2018

Improve understanding of tidal water response to load changes

Synthesis report, 2018

ITAT

Develop land cover dataset

Y

Land Cover WQ

Enhance watershed and SPARROW model

Y

Modeling WG

Examine Susquehanna reservoirs' impact on N and sed transport

Y

Modeling WG

Assess N and sed response to management practices

Synthesis report, 2018

ITAT/Modeling WG

Incorporate BMP efficiencies and land cover/use

Y

Modeling WG

Conduct STAC peer reviews

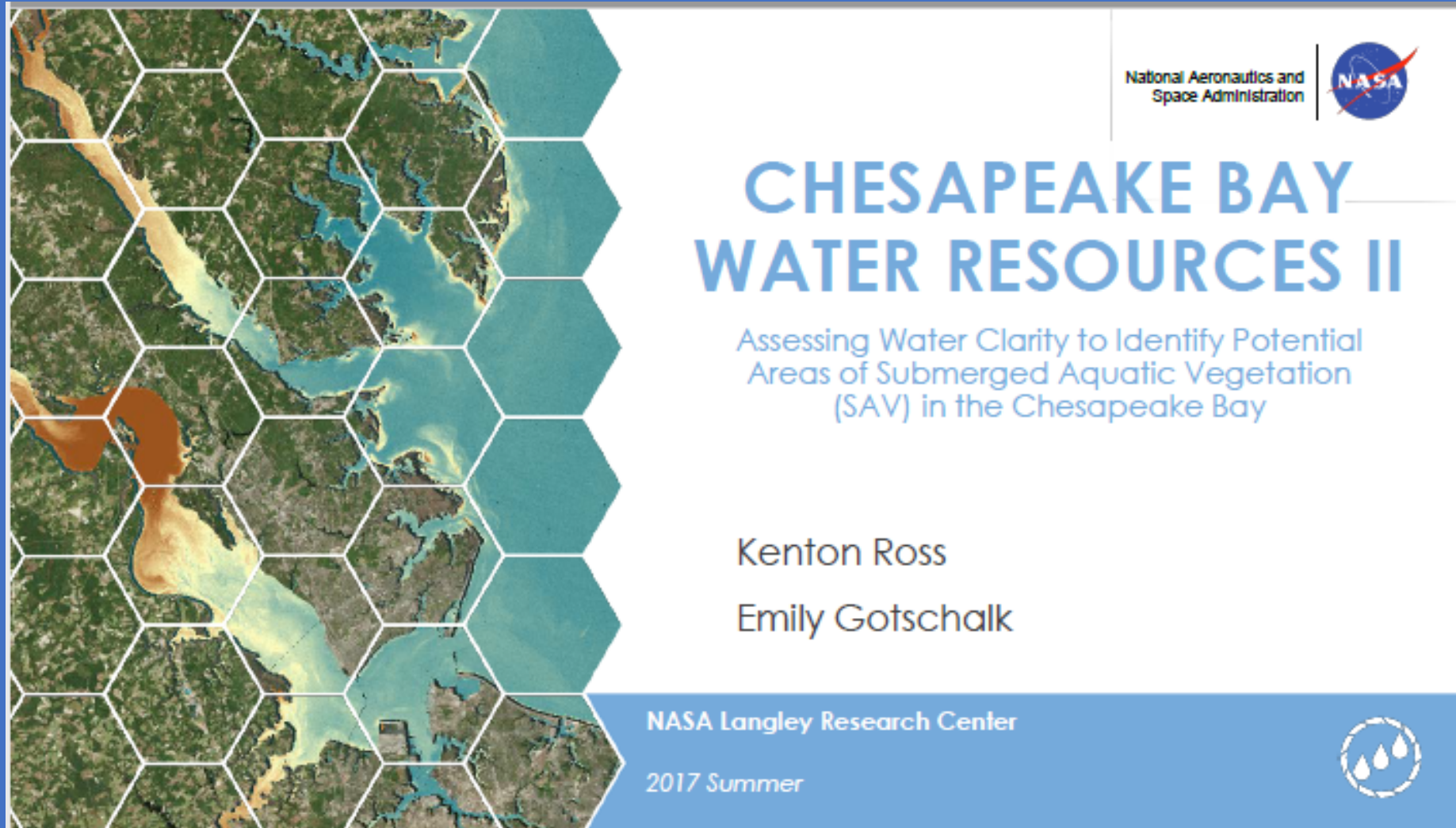
Y

STAC/Modeling WG

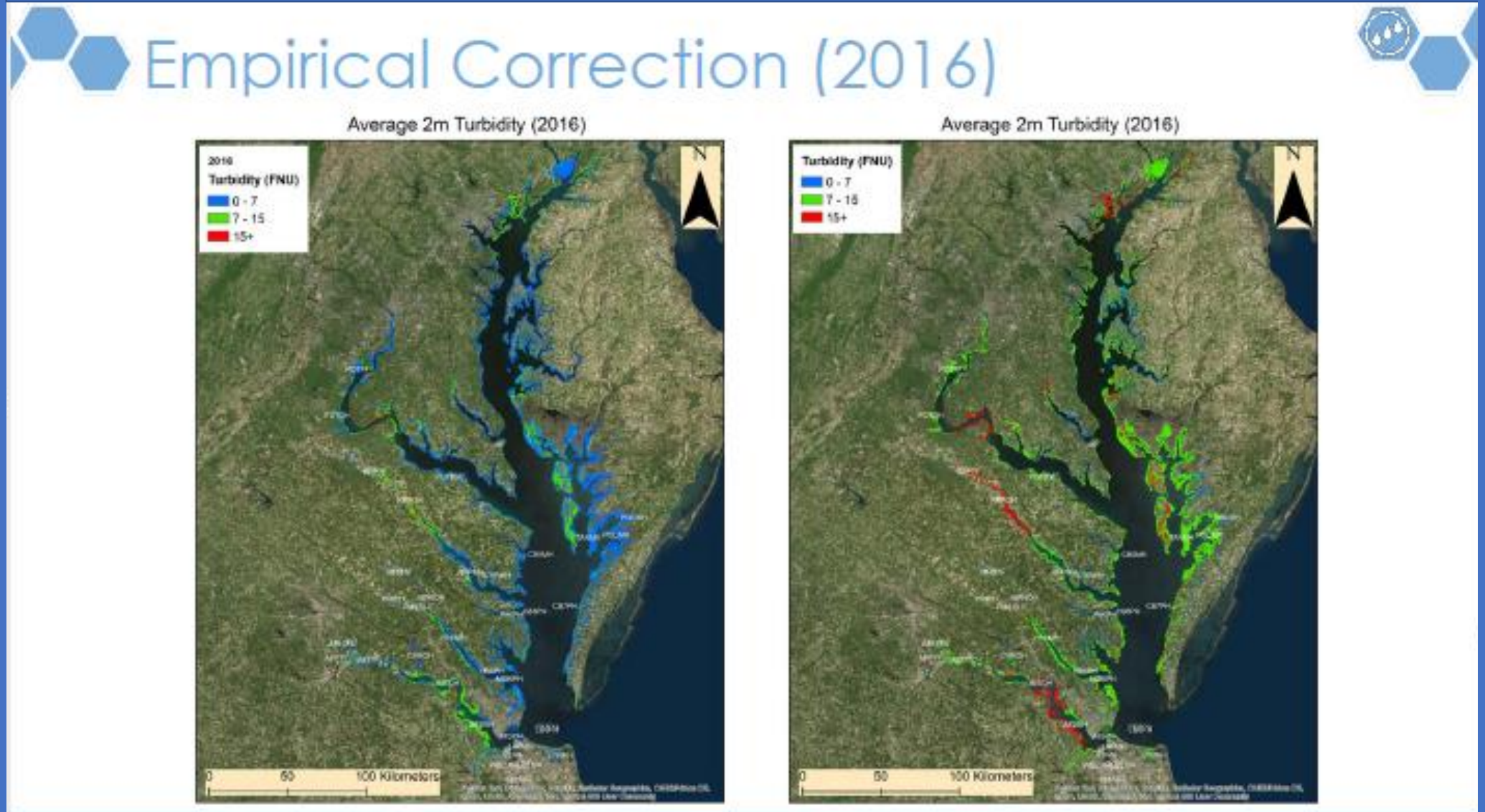
And there are still other catalogues of information needs to reference from the CBP Goal Implementation Teams...

Example: Water Quality GIT

Recent NASA collaborations on potential protocols
for using satellite imagery:
NASA DEVELOP program output



Opportunities for baywide water quality standards attainment assessment applications: Water clarity



Summary

- There are multiple catalogues of CBP data needs being maintained (and still others being developed e.g., for the evolving Fish Habitat Assessment)
- Understanding NASA products available may already offer opportunities to fill existing gaps in data needs.
- Understanding the details for any one of these data needs will be key to furthering our collaboration.
- Thank you 😊.