Status of CBP Indicator Updates/Changes (9/20/12)

Restoration Effort Indicators

Reducing Pollution

Indicator w/ Link	What We Told MB	MB Response	Our Response	Next Steps
Reducing Nitrogen Pollution	Update w/ 2011 data in April 2012	okay	Water Quality GIT updated w/ 2011 data; embargoed until 2012 EC mtg	Water Quality GIT: update with 2012 data when avail. **(embargo for EC?)**
Reducing Phosphorus Pollution	Update w/ 2011 data in April 2012	okay	Water Quality GIT updated w/ 2011 data; embargoed until 2012 EC mtg	Water Quality GIT: update with 2012 data when avail. **(embargo for EC?)**
Reducing Sediment Pollution	Update w/ 2011 data in April 2012	okay	Water Quality GIT updated w/ 2011 data; embargoed until 2012 EC mtg	Water Quality GIT: update with 2012 data when avail. **(embargo for EC?)**
Wastewater (supplemental to the Reducing Pollution indicators)	Develop new indicator in time for 2012 EC mtg	okay	Water Quality GIT updated w/ 2011 data; embargoed until 2012 EC mtg	Water Quality GIT: update with 2012 data when avail. **(embargo for EC?)**

Restoring Habitats

Indicator w/ Link	What We Told MB	MB Response	Our Response	Next Steps
Bay Grasses Planted	Update w/ 2011 data in time for 2012 EC mtg; tracking revised target	okay	Habitat GIT updated w/ 2011 data prior to 2012 EC mtg; did not revise target	Habitat GIT: update with 2012 data when avail. and revise target
Wetlands Restoration Efforts	Update w/ 2011 data in time for 2012 EC mtg; tracking revised target	okay	Habitat GIT revised to track new target and updated w/ 2011 data prior to 2012 EC mtg	Habitat GIT: update with 2012 data when avail. May need to track black duck outcome as well.
Wetlands Enhancement and Rehabilitation	Update w/ 2011 data in time for 2012 EC mtg; tracking revised target	okay	Habitat GIT was not able to update or revise to track new target prior to EC mtg	Habitat GIT: revise and ***update w/ 2011 data as soon as possible***
Re-Opening Fish Passage	Update w/ 2011 data in time for 2012 EC mtg	okay	Habitat GIT updated w/ 2011 data prior to EC mtg	Habitat GIT: update with 2012 data when avail.
Restoring Oyster Reefs	Will no longer be used; replace w/ new metrics for oyster habitat/populations; partial assessment data available by 2013 EC mtg	okay	Fisheries GIT presented oyster metrics to MB in January 2012; developing new indicator based on partial assessment data	Fisheries GIT: develop new indicator by 2013 EC mtg; Web Team to ***remove old indicator from CBP website as soon as possible***

Status of CBP Indicator Updates/Changes (9/20/12)

Managing Fisheries

Indicator w/ Link	What We Told MB	MB Response	Our Response	Next Steps
Blue Crab Fishery Management	Update w/ 2011 data in time for 2012 EC mtg; tracking revised target	okay	Fisheries GIT revised to track new target; updated w/ 2011 data prior to EC mtg and 2012 data after	Fisheries GIT: update with 2013 data after 2013 Advisory Report is released (summer 2013)
Oyster Restoration	Developing indicator using new metrics for oyster habitat/populations by 2013 EC mtg	okay	Fisheries GIT presented oyster metrics to MB in January 2012; developing new indicator based on partial assessment data	Fisheries GIT: develop new indicator by 2013 EC mtg

Protecting Watersheds

Indicator w/ Link	What We Told MB	MB Response	Our Response	Next Steps
Planting Forest Buffers	Update w/ 2011 data in time for 2012 EC mtg; tracking revised target	okay	Forestry Workgroup revised to track new target and updated w/ 2011 data prior to 2012 EC mtg	Forestry Workgroup: update with 2012 data when avail.
Developing Watershed Management Plans	Will no longer be used	Concerned this may have been a staff decision; wants to know if the Watershed GIT has dismissed indicator	Watershed GIT conducted a poll	Watershed/Stewardship GIT coordinators/staff: evaluate results of poll; discuss w/ Watershed GIT state reps.
Protected Lands	Update w/ 2011 data in summer/fall 2012; tracking revised target	okay	Stewardship GIT working to revise and update	Stewardship GIT: revise and ***update w/ 2011 data in fall 2012***

Fostering Stewardship

Indicator w/ Link	What We Told MB	MB Response	Our Response	Next Steps
Public Access Index	Will no longer be used; replace w/ supporting indicator (below)	okay	Remove index from CBP website; elevate supporting indicator	Web Team: ***remove*** index from CBP website/***elevate*** "sites" indicator ***in fall 2012***
Public Access Sites	Update w/ 2011 data in summer/fall 2012; tracking revised target	okay	Stewardship GIT working to revise and update	Stewardship GIT to revise and ***update w/ 2011 data in fall 2012***

K-12 Education (MWEE)	MWEE will be refined by Spring 2013. Refinement will be informed by the outcomes of STAC workshop	okay	Education Workgroup will refine and update but wants to keep current indicator up until the new one is ready	Education WG will refine MWEE metric by spring 2013, based on results of STAC workshop; pilot with 2013/14 academic year
Citizen and Community Action: Bay Partner Communities	Will no longer be used	okay	Remove old indicator from CBP website	Web Team to ***remove old indicator from CBP website as soon as possible***

Bay Health Indicators

Habitats & Lower Food Web

Indicator w/ Link	What We Told MB	MB Response	Our Response	Next Steps
Bay Grass Abundance	Update w/ 2011 data in March 2012	okay	SAV Workgroup updated w/ 2011 data	SAV Workgroup to update with 2012 data when avail.
Phytoplankton (Index of Biotic Integrity)	Update w/ 2011 data in March 2012; may no longer be used	In addition to looking into the continued utility of the current phytoplankton indicator, determine if the removal of that indicator in the Habitats and Lower Food Web category will create a gap that needs to be filled or if reporting only on SAV and bottom habitat (B-IBI) is sufficient.	Tidal Workgroup updated w/ 2011 data; STAR will follow-up on MB response	Tidal Workgroup will ***respond to MB request ASAP.*** To discuss at Sept 20 TMAW mtg.
Bottom Habitat (Benthic Index of Biotic Integrity)	Update w/ 2011 data in Feb 2012	okay	Tidal Workgroup updated w/ 2011 data	Tidal Workgroup to update with 2012 data when avail.
Tidal Wetlands Abundance	May no longer be used; Issues w/ tracking	Determine feasibility of continued updates	STAR will follow-up	Report back to Wetlands WG in fall 2012 (NOAA C-CAP data will have another year's worth of data available soon, but not in time for 2012 end-of-year summary)

Status of CBP Indicator Updates/Changes (9/20/12)

Fish & Shellfish

Indicator w/ Link	What We Told MB	MB Response	Our Response	Next Steps
Blue Crab Abundance	Update w/ 2011 data in time for EC mtg; tracking revised target for females	okay	Fisheries GIT revised to track new target; updated w/ 2011 data prior to EC mtg and 2012 data after	Fisheries GIT to update with 2013 data after 2013 Advisory Report is released (summer 2013)
Striped Bass Abundance (Spawning Female Biomass)	Update w/ current data in time for EC mtg; will revise to report coastal stock assessment	okay	Fisheries GIT not able to update in time for EC mtg	Fisheries GIT to revise and ***update with 2011 data as soon as possible***
Juvenile Menhaden Abundance in Maryland	Update w/ current data in time for EC mtg; will revise to report coastal stock assessment	okay	Fisheries GIT not able to update in time for EC mtg	Fisheries GIT to revise and ***update with 2011 data as soon as possible***
American Shad Returning to Chesapeake Bay	May no longer be used	Want to know why not; believes CBP should continue to use indicator	Fisheries GIT asked STAR to convene action team to develop new indicator	Shad Indicator Action Team**:** develop recs. and test w/ 2013 data beginning spring 2013
Native Oyster Abundance (Biomass)	Will no longer be used; replace w/ new metrics for oyster habitat/populations; partial assessment data available by 2013 EC	okay	Fisheries GIT presented oyster metrics to MB in January 2012; developing new indicator based on partial assessment data	Fisheries GIT: develop new indicator by 2013 EC mtg; Web Team to remove old indicator from website after new one developed in spring 2013

Water Quality

Indicator w/ Link	What We Told MB	MB Response	Our Response	Next Steps
Dissolved Oxygen Standards Attainment	Update w/ 2011 data in April 2012	okay	Tidal Workgroup updated w/ 2011 data	Tidal Workgroup: update with 2012 data when avail.
Mid-Channel Water Clarity	Update w/ 2011 data in April 2012	okay	Tidal Workgroup updated w/ 2011 data	Tidal Workgroup: update with 2012 data when avail.
Chlorophyll a	Update w/ 2011 data in April 2012	okay	Tidal Workgroup updated w/ 2011 data	Tidal Workgroup to update with 2012 data when avail.
Chemical Contaminants	Update w/ 2011 data in Nov	okay	STAR to follow up	WQGIT: ***update with 2012***

	2012			***303d assessment data in Nov 2012 or spring 2013***
Water Quality Standards	Developing new indicator	okay	STAR to follow up; CAP WG evaluating options	CAP WG present to EPA (done), WQGIT (9/24 or 10/9/12) and STAR (10/25 or 11/29/12)

Watershed Health Indicators

Health of Freshwater Streams

Indicator w/ Link	What We Told MB	MB Response	Our Response	Next Steps
Health of Freshwater Streams in Watershed (B-IBI)	Update w/ 2011 data in April 2012	okay	Non-Tidal Workgroup updated w/ 2011 data	Non-Tidal Workgroup to update with 2012 data when avail.
Brook Trout	Hope to have new indicator in April 2012	okay	Habitat GIT/EBTJV presented concept to MB in May 12; to STAR in Aug 12; STAR convened Action Team in Aug 12	Brook Trout Indicator AT: recs. for new outcome and indicator to be discussed by Team 9/25/12

Flow Adjusted Pollution Trends

Indicator w/ Link	What We Told MB	MB Response	Our Response	Next Steps
Nitrogen in Rivers Entering the Bay: Long-Term Flow Adjusted Concentration Trends	Update with more current data in June 2012	okay	Non-Tidal Workgroup updated with 2010 data prior to EC mtg	Non-Tidal Workgroup will ***update with 2011 data in fall 2012***
Phosphorus in Rivers Entering the Bay: Long-Term Flow Adjusted Concentration Trends	Update with more current data in June 2012	okay	Non-Tidal Workgroup updated with 2010 data prior to EC mtg	Non-Tidal Workgroup will ***update with 2011 data in fall 2012***
Sediment in Rivers Entering the Bay: Long-Term Flow Adjusted Concentration	Update with more current data in June 2012	okay	Non-Tidal Workgroup updated with 2010 data prior to EC mtg	Non-Tidal Workgroup will ***update with 2011 data in fall 2012***

Trends				
Nitrogen Yields and Short-Term Trends in Watershed Streams/Rivers	Update with more current data in 2012; revise maps	okay	Non-Tidal Workgroup to develop revised maps and update data	Non-Tidal Workgroup will revise/***update with 2011 data in fall 2012***
Phosphorus Yields and Short-Term Trends in Watershed Streams/Rivers	Update with more current data in 2012; revise maps	okay	Non-Tidal Workgroup to develop revised maps and update data	Non-Tidal Workgroup will revise/***update with 2011 data in fall 2012***
Sediment Yields and Short-Term Trends in Watershed Streams/Rivers	Update with more current data in 2012; revise maps	okay	Non-Tidal Workgroup to develop revised maps and update data	Non-Tidal Workgroup will revise/***update with 2011 data in fall 2012***

Land Cover

Indicator w/ Link	What We Told MB	MB Response	Our Response	Next Steps
Chesapeake Bay Watershed Forest Cover	Data source changing; historic time period to be reduced; move to this group ("Watershed Health")	Okay w/ addition; asked STAR to review new data/time period	Nita/Mike added in July 2012; Forest WG reviewed options 9/5/12; agreed to use FIA data for now (see attached briefing paper)	***Updating in fall 2012***; early 2013 FWG will review other sources of data and bring proposal to STAR in summer 2013

Additional Comments from MB:

MB Response	Our Response	Next Steps
Determine if the current mix of indicators in the Watershed Health categories are sufficient	STAR will follow-up	Watershed GIT and Non-Tidal Workgroup will work together to ***respond to MB request by end of 2012.***

Factors Impacting Health Indicators

Pollutants

Indicator w/ Link	What We Told MB	MB Response	Our Response	Next Steps
Nitrogen Loads and River Flow To the Chesapeake Bay	Update w/ 2011 data in May 2012	okay	Non-Tidal Workgroup not able to update May	Non-Tidal Workgroup to ***update with 2011 data in fall 2012***
Phosphorus Loads and River Flow To the Chesapeake Bay	Update w/ 2011 data in May 2012	okay	Non-Tidal Workgroup not able to update May	Non-Tidal Workgroup to ***update with 2011 data in fall 2012***

Sediment Loads and River Flow To the Chesapeake Bay	Update w/ 2011 data in May 2012	okay	Non-Tidal Workgroup not able to update May	Non-Tidal Workgroup to ***update with 2011 data in fall 2012***

Land Use

Indicator w/ Link	What We Told MB	MB Response	Our Response	Next Steps
Chesapeake Bay Watershed Population	Update w/ 2011 data in April 2012	okay	STAR updated w/ 2011 data in June	Peter Claggett to update with 2012 data when avail.
Chesapeake Bay Watershed Forest Cover	Data source changing; historic time period to be reduced; move to Watershed Health group	Asked STAR to review new data/time period; okay w/ adding to Watershed Health; concern w/ removal from "Factors" group	Kept in "Factors"; added to new Land Cover category w/in Watershed Health group; Forest WG reviewed options 9/5/12; agreed to use FIA data for now (see attached briefing paper)	***Updating in fall 2012***; early 2013 FWG will review other sources of data and bring proposal to STAR in summer 2013

Natural Factors

Indicator w/ Link	What We Told MB	MB Response	Our Response	Next Steps
River Flow	Update w/ 2011 data in April 2012	okay	Non-Tidal Workgroup updated w/ 2011 data in July	Non-Tidal Workgroup to update with 2012 data when avail.
Water Temperature		Need new indicator in this category: *Water Temperature*	STAR will follow up	Tidal Workgroup to discuss tidal water temp indicator 9/20/12; Non-Tidal Workgroup to discuss non-tidal water temp indicator October 2012

Additional Comments from MB:

MB Response	Our Response	Next Steps
Determine if the current mix of indicators in the Factors Impacting Health categories are sufficient	STAR will follow-up	Watershed GIT and Non-Tidal Workgroup will work together to ***respond to MB request by end of 2012.*** Fisheries GIT may become involved to consider incorporating an invasive catfish indicator.

Forestry Workgroup Meeting

September 5, 2012

Briefing Paper

Forest Cover Information for Reporting

Forest cover in the Chesapeake Bay watershed is an indicator tracked on the website that has not been updated for a decade or more. The current forest cover indicator shows that 58% of the watershed land area is forested and this indicator has not changed since originally reported.

There are three sources of forest cover data that have been used at the Bay Program: 1) the Forest Inventory and Analysis (FIA) data from the US Forest Service; 2) the Chesapeake Bay Land Change Datasets, and 3) the CB Watershed Model calibration land use data. All of these sources have caveats that will be discussed. A fourth option would be to use high-resolution imagery to derive information on forest cover extent and trends.

Points about the Various Options

Option 1: FIA data.

- FIA is the scientific standard for estimating forest cover in the US. It only looks at true forest (i.e., wooded areas with an unmanaged understory and non-wooded areas planted with trees or undergoing natural succession). Currently, FIA reports CB forest cover to be 55%.
- The CB Watershed Model does not use FIA data.
- Since FIA is a large statistical dataset, the best usable confidence interval is 68%, and must be reported with the associated sampling error (i.e., 55% plus or minus 1%). Comparing years, i.e., examining forest trends, can increase the sampling error

substantially.

- The most recent estimate (year 2009) of percent forest area in the watershed is 55% but should not be compared to the 58% reported previously because these estimates were derived differently, even though both were based on FIA data. In order to compare numbers (i.e., show trends) the decadal estimates have been adjusted using the new means of deriving FIA information. The most recent decadal estimates of forest area are: 1980"s- 24.168 million acres, 1990"s- 23.692 million acres and 2000's- 23.689 million acres.

Option 2- CBLCD:

- The CBLCD represents four dates of comparable land cover data derived from Landsat 5 and Landsat 7 imagery and covering the entire Chesapeake Bay watershed. These data represent the years 1984, 1992, 2001, and 2006.
- Over the 22-year period from 1984 – 2006, tree canopy (deciduous, evergreen, mixed forest? , and woody wetlands) decreased from 25.489 million acres (1984) to 25.050 million acres (2006) and represented roughly 57% of the watershed land area in 2006. If shrub-scrub is included in the forest class due to its representation of early successional stages of forest, the trend shows that tree canopy and shrub-scrub decreased from 26.547 million acres (1984) to 26.186 million acres (2006) -- roughly 60% of the watershed land area in 2006.
- Landsat satellite derived land cover products are able to represent tree canopy but are not able to characterize forest understory conditions or urban tree canopy where the canopy features are typically smaller than the spatial resolution of Landsat (30m cells). For these reasons, forested low-density residential neighborhoods appear similar to natural forest lands and urban tree canopy is underestimated.
- Including scrub/shrub in a "forest" definition may be consistent with an FIA definition of forest.

Option 3- CB Watershed Model calibration data

- "Forests" in the Watershed Model include any and all land uses that are not classified as either agriculture, urban, extractive, or water. Therefore, this land use is more appropriately called "Open/Woody" because it is inclusive of non-forest areas and overestimates of the extent of true forest. In phase 5.3.2 of the Watershed Model, the "open/woody" land use represents 63.3% of the watershed land area.
- While the watershed model urban land uses (mapped data from satellite and road information combined with estimates of residential area based on Census reported housing units) provide a more accurate representation of the extent of urban land compared with the CBLCD and the model agricultural land use is based on the USDA's Census of Agriculture which is more accurate that the CBLCD for assessing the extent of farmland, the remaining "open/woody" class does not account for understory characteristics which FIA references as a distinguishing factor separating true forests from woodlots. Moreover, non-forested areas such as road and power transmission right-of-ways, landfills, and tidal marshes are included in the watershed model "open/woody" class.

Option 4- Forest Cover Using High Resolution Imagery:

- There is the potential to track and estimate Bay-wide forest cover with high levels of accuracy and precision using a combination of Landsat and high-resolution satellite or aerial imagery.
- This effort would require the development of two sampling frameworks, one for assessing a baseline of forest extent and another to assess forest trends. This would be a new effort at CBPO but it would likely be more accurate than FIA (e.g., more data points and a design emphasizing change detection) and could potentially help explain the difference between FIA and the CB Model forest area estimates.

Recommendations:

1. Track trends in "forests" using FIA data but unlike previous efforts, include standard errors and confidence limits when reporting any and all FIA statistics for the Bay watershed, states, and major sub-basins.
2. Assess whether the precision of FIA trend data for the Chesapeake Bay watershed is sufficient to inform forest restoration and preservation management decisions.
3. If the precision of the FIA trend data is insufficient to inform management decisions in the Chesapeake watershed, explore the feasibility of Option #4- sampling the extent and changes in forest cover using a combination of moderate and high-resolution satellite imagery.
   Note: USGS and USFS are exploring this option currently.