

**Chesapeake Bay Program Committee, Subcommittee, and Work Group Activities for  
STAC**

(Assembled through emails of 07/05/05)

**Mid-Atlantic Regional Panel on Aquatic Nuisance Species Meeting (MARP) (April  
01,2005)**

All presentations can be viewed at:

<http://www.chesapeakebay.net/marp.htm> (click on current projects and info)

Aquatic Nuisance Species Task Force Overview (Don MacLean USFWS)

He explained that the establishment of the Task Force was required under the Nonindigenous Aquatic Nuisance Species Prevention and Control Act of 1990. In addition to establishing the Task Force, the 1990 Act included many other components including; ballast water, establishment of the Aquatic Nuisance Species Program, facilitation of regional coordination through the establishment of regional panels, establishment of the state aquatic nuisance species management plan, and emphasis on the Great Lakes.

The 1990 Act was reauthorized in 1996 as the National Invasive Species Act and it included; increased coordination and other responsibilities related to ballast water and shipping, expanded role and scope of regional panels, and broadened focus outside the Great Lakes.

The Task Force was officially established a year after the 1990 Act was passed. It provides a forum to discuss aquatic invasive species issues, engages and involves governmental and non-governmental entities, and allows for coordination of issues across jurisdictional boundaries. There are 9 federal members, 6 regional panels, and 5 subject committees (control, detection and monitoring, communication, education, and prevention).

The public awareness campaigns “Stop Aquatic Hitchhikers” and “Habitattitude” are among the current outreach programs. The Task Force has control and management plans for the green crab, Chinese mitten crab, Eurasian ruffe, and brown tree snake and plans for the Asian carp, Asian swamp eel, and New Zealand mud snail.

The Great Lakes Regional Panel Experience (Kathe Glassner-Swyder, Great Lakes  
Commission)

She stated that the Great Lakes Commission (8 Great Lakes states, Ontario, and Quebec) strategic goal is to restore and protect the ecological and economic health of the Great Lakes by preventing the introduction of new invasive species and limiting the spread of established populations. It has priority actions to support; advocacy, education/information, research coordination and policy, and aquatic invasive species program coordination. For more details about the Great Lakes Commission, please check out <http://www.glc.org>

The Gulf of Mexico Regional Panel Experience (Ron Lukens, Gulf States Marine Fisheries Commission)

This panel was established in late 1999 under the administration of the Gulf of Mexico Program. In late 2001, there was a proposal to transfer administrative responsibility to the Gulf States Marine Fisheries Commission which was completed in 2002.

The panel's workgroups include the following; research and development, education and outreach, early detection and rapid response, information management, pathways and prevention, eradication and control. For more details about the Gulf Regional Panel, please check out <http://nis.gsmfc.org>

Priority Aquatic Nuisance Species in the Chesapeake Bay Watershed (Kerrie Kyde, MD DNR)

She discussed the 6 species of concern in which regional management plans were written; zebra mussel, nutria, mute swan, water chestnut, common reed, and purple loosestrife.

There is presently an active eradication program for nutria in Dorchester County since 1997. Phase I of the project was to conduct research to estimate densities, monitor behavior, and evaluate reproductive health. Phase II consisted of trappers evaluating various trapping techniques to determine efficacy. The US Army Corps of Engineers began feasibility studies and restoration projects in Blackwater National Wildlife Refuge in 2003.

Mute swans number close 4,000 in the MD portion of the Bay watershed. They are problematic because they consume millions pounds of SAV annually, displace native waterfowl from breeding and foraging grounds, and can physically injure wetland birds. Egg addling began in 2002 and was halted by lawsuits from animal rights groups. The US District Court of Appeals for DC found the mute swan to be protected under the Migratory Bird Treaty Act. The Migratory Bird Treaty Reform Act of 2005 excludes birds introduced by humans from being protected under the Migratory Bird Treaty Act. The mute swan is one of 125 species that the US FWS list as not covered. The MD DNR will recommence activities under the MD mute swan management plan which include; increasing public awareness of swan impacts, preventing escape or reproduction of captive birds, reducing swan human interactions, monitoring populations and effective management practices, investigating non-lethal control methods, and removing swans from "swan free areas".

Water chestnut has been found in Harford and Kent counties in MD. They can injure humans and restrict recreational water use, compete with and crowd out marsh Bay grasses, reduce desirable habitat for native wildlife, and create breeding grounds for mosquitoes. Mechanical control has proven to be the most effective practice to date.

Phragmites alters the structure and function of native marshes, alters hydrology and reduces wildlife habitat, increases the potential for marsh fires, inhibits mosquito monitoring and control, and presents aesthetic problems for humans. MD DNR offers a program to private landowners for a 50% cost share to control phragmites on their property. Control is mostly accomplished by

helicopter application. More than 600 landowners have had applications made to 1700 acres of public and private lands.

Purple loosestrife forms dense, monotypic stands and replaces native vegetation, reducing wildlife food and shelter. It can clog ditches, canals, streams, and change hydrology by promoting silt deposition. This plant can affect nutrient levels by changing input to spring and summer detritivore communities. MD DNR has submitted an initiative to train volunteers to recognize and report infestations of this plant, develop geo-referenced database of infestation sites, determine different methods of control, organize and train volunteers for removal days, release *Galerucella* beetles as deemed appropriate, and monitor and track populations and spread rates.

#### Priority Aquatic Nuisance Species in the Delaware Bay Watershed (Ann Faulds, PA Sea Grant)

She stated that there has been no concerted effort to prioritize aquatic invasive species management in DE Bay watershed. PA Sea Grant developed a survey to determine what species represent a potential ecological and economic threat to the aquatic communities of the DE estuary. From the combined rankings the priority plant species were Phragmites, purple loosestrife, and Japanese knotweed. The top three animals were zebra mussels, resident Canada geese, and flathead catfish.

The PA Sea Grant has a poster entitled “Aquatic Supertramps of the Delaware Valley” and more information can be found at: <http://www.pserie.psu.edu/seagrant> PA’s state management plan is in the initial stages of development. New Jersey now has an Invasive Species Council and DE has a statewide invasive species management plan which covers terrestrial and aquatic invasives. DE list of restricted and invasive plants include; marsh dewflower, purple loosestrife, and reed canary grass. Widespread and invasive aquatic plants include common reed and hydrilla.

#### Priority Aquatic Nuisance Species in North Carolina (Rob Emens, NC Division of Water Resources)

NC has no invasive species management plans. Nutria were introduced to some counties in the 1970’s. All introduced fishes with the exception of the lionfish are freshwater species. Flathead catfish and red shiner are fish species of the highest concern, snakeheads and black carp are banned in the state. The Asian clam is the most dominant mollusk in most NC rivers.

Hydrilla and giant salvinia are federally listed noxious weeds, and state listed noxious weeds are alligator weed and creeping water primrose. An unlisted but problematic aquatic plant is parrot feather. The NC program uses triploid grass carp for control of hydrilla, this has been the most cost effective management tool to date. Flea beetles and herbicides have been used to control alligator weed. Some weevils have been found to be effective for the control of giant salvinia (floating aquatic fern) where isolated infestations have been found. Creeping water primrose is a mat forming perennial that is introduced as an ornamental and parrot feather is a submerged plant with emergent flora spikes. Many areas that these plants have invaded are terrestrial areas that were converted to aquatic zones when dams were built.

### “Stop Aquatic Hitchhikers” (Joe Starinchak, USFWS)

This is a national public awareness and partnership campaign that addresses aquatic invasive species. The campaign targets recreational users of aquatic resources to raise their awareness and seek their ownership for the issue of aquatic invasive species. It uses a themed brand that has a distinct visual identity and provides a strong call to action. Agencies and organizations can become members and for more details please check out their website at:

<http://www.protectyourwaters.net>

### “Habitattitude” (Marshall Myers, Pet Industry Joint Advisory Council)

Pets are an important part of our culture. Over 13 million households maintain aquaria. Water gardens are becoming increasingly popular. Collectively, these sectors contribute significantly to the US economy. An increased frequency of pets, fish, plants, and other organisms associated with the pet industry are found in the environment. This translates into increased scrutiny and negative public perceptions about the industry. This campaign which is another Task Force outreach initiative targets the pet and aquarium trade and the nursery and landscape industry.

Objectives of this program are; change traditional thinking that it’s easier to ban than to educate, unify government, academia, and industry to address this issue, employ social marketing techniques, and demonstrate accountability for outreach activities. Partners of the campaign are Pet Industry, USFWS, and NOAA Sea Grant. For more details, please check out their website at: <http://www.habitattitude.net>

There has been a great industry support of the campaign. Materials appear in over 2,000 retail stores and the brand has appeared on over 20 million bags and over 4 million fish boxes.

### **Nutrient Subcommittee Meeting (April 27, 2005)**

**Rich Batiuk (EPA CBPO)** gave a powerpoint presentation on the progress reporting related to new BMP communications strategy. His presentation can be found at:

<http://www.chesapeakebay.net/calendar.cfm?EventDetails=5723&DefaultView=2&RequestDate=04/28/2005>

The Bay Program is always looking for ways to shorten the time it takes to release and present State of the Bay and State of the Bay Restoration information to the public. The Bay Program wants to be pro-active rather than reactive with communications with their target audience.

The four components of the indicator frameworks include; Chesapeake Bay and watershed restoration, Chesapeake Bay and watershed stressors, watershed health, and Chesapeake Bay ecosystem health.

The Nutrient Subcommittee roles and responsibilities are as follows:

Lead on deriving/refining “land and loads” indicators under the CB and watershed restoration component.

Help think through how to derive the “restoration progress index” from the underlying indicators.

Work with the Monitoring and Assessment Subcommittee's Nontidal Monitoring Workgroup on developing/refining "loads" indicators under the CB and watershed stressors component.

Work with the Information Management Subcommittee on evaluating the barriers to more timely reporting of agricultural BMP data, urban stormwater BMP data, and point source concentration and flow data.

Work through representation of Monitoring and Assessment Subcommittee on scoping out how to carry out the annual integrated assessment of CB and watershed restoration progress.

**Jeff Halka (USGS)** presented the final sediment report and it can be viewed at the following: <http://www.chesapeakebay.net/calendar.cfm?EventDetails=5723&DefaultView=2&RequestDate=04/28/2005>

Tidal sediment is a combination of fastland and nearshore erosion. This report presents technical data and implications as well as how to reduce shoreline erosion. It will also point interested parties towards the appropriate resources. The USGS, CBPO, DNR, and NOAA CBPO have reviewed this report.

**Tom Simpson (UMD) and Russ Mader (NSC Coordinator CBPO)** announced that in addition to the GOA review, the EPA Inspector General's office will also review the CBPO. The review will decide how effective the CBP is accomplishing its goals and if the CBP is structured in a way to meet its goals. The first phase of the review is focused on the agricultural sector.

**Fred Samadani (MDA)** announced that Tom Juengst (PA DEP) will be the new Agriculture Nutrient Reduction Work Group chair.

**Randy Sovic (WV DEP)** informed the group that WV ran its last tributary strategy input deck and reached its nutrient target. Project teams for both Sleepy Creek and Opequon Creek watersheds had their first meetings to begin addressing resolving issues within these two targeted priority watersheds. There will be a stormwater workshop focused on construction related sediment in Buckley and Morgantown in May.

**Kenn Pattison and John Murtha (PA State)** informed the subcommittee that the sixth and last public tributary strategy meeting was over. The PA point source staff is producing their second draft of the watershed permit. The permit is open to all significant point source and monitoring requirements set forth by the point source work group. After June 1, 2007 staff will begin entering all load limits for significant and non-significant facilities. If point source goals are not met by 2007, all significant dischargers will receive a load allocation and monitoring will commence.

**Collin Burrell (DC Government)** announced that Mayor Williams kicked off Green Week and he supports the idea of a separate Dept. of the Environment, currently under the Dept. of Health. The Urban Forestry Conservation Act came into effect in January of this year. The bill states that a permit is needed in order to cut down a tree with a diameter greater than 55 inches and if one is cut down, one must plant another 55 inch tree or a combination of trees that equal 55 inches. DC hosted the National Green roof Convention in May.

**Stu Wilson (VA DCR)** informed the members that nutrient management plans were out for public review early May and the public meeting would be held in June. The plans address phosphorus management requirements and timing of nutrient applications.

**Bob Ehrhart (VA DEQ)** announced that he is stepping down as the CBPO point source work group chair and that future work includes:

VA comment on technical allocations and point source load allocations closed the end of April. The nutrient exchange legislation was signed off on by the Governor.

There are point source funds available for nutrient removal. Some proposed ways to use the money include updating water quality guidelines and grants for waste water treatment plants to reduce nutrient loads.

**Norm Goulet (NOVA Region)** gave an update on the urban stormwater work group activities including an invitation to attend the Urban Summit on May 11-12. Reggie Parrish (CBPO USWG Coordinator) and Norm attended the Forestry Work Group meeting last month to address their proposed partnership. This is the first step in using trees in urban stormwater practices.

#### **Non-Tidal Water Quality Workgroup Conference Call (May 11, 2005)**

**Steve Preston (USGS CBPO Monitoring & Assessment Coordinator)** and **Troy Keller (UMCES CBPO)** presented the key non-tidal indicators that need improvement for this summer. Flow is put together by USGS and is managed by Wendy McPherson.

The nitrogen, phosphorus, and sediment trend indicators are also generated by USGS and are based upon flow-adjusted rates. This indicator only shows the Susquehanna and river input monitoring program (RIMP) sites, not the full network sites. It was suggested to make two maps; one for just the RIMP sites and one showing all of the network sites. Another suggestion was to highlight the individual watershed to show trends instead of a single point.

The nitrogen, phosphorus, and sediment load indicators are also calculated by USGS at all 9 RIMP sites. The recommendation is to change total loads rather than using the 9 RIMP sites by using a combined approach of modeling and measurement. Troy outlined how to do this in his presentation which can be found at:

<http://www.chesapeakebay.net/calendar.cfm?EventDetails=5543&DefaultView=2>

**Scott Phillips (USGS)** provided an update on STAC technical meetings about the non-tidal network and analysis of data, since STAC had identified deficiencies within the network. Their findings will come out in the form of reports in June and this workgroup will discuss their findings to incorporate into the three year plans for the RFP. He also discussed the points to be made to the Implementation Committee in June about using additional EPA 106 funding to the states to help implement more sites for the non-tidal network.

#### **Tidal Monitoring and Analysis Workgroup Meeting (May 12, 2005)**

**Bill Dennison (UMCES), Dave Jasinski (UMCES CBPO), Peter Tango (MD DNR), and Mike Williams (UMCES CBPO)** gave updates on the summer ecological forecast. Since only 3.3% of the Bay is anoxic, hypoxia needs to be incorporated. HAB's will be tracked throughout the summer. To forecast SAV, three habitat/salinity zones were evaluated. Relationships of the

area coverage, density and percent change of SAV from year to year with a large number of independent variables were generally weak.

The obstacles to the development of an accurate forecasting model include: overlap of SAV communities, compositing data for the entire Bay masks meaningful relationships, generally a small number of segments are driving area trends, and large decreases in SAV can be due to mahogany tides, dark-false mussels, macroalgae, shoreline sedimentation, scouring due to hurricanes, etc. that are currently not usable as independent variables since they are not routinely monitored and measured. The conclusion is to look at smaller spatial scales (e.g., individual tributaries) instead of the Bay as a whole.

Some reasons why to do the forecast now:

Provides an opportunity to educate the public, encourages public inquiry, can educate boaters about SAV beds and no wake zones, have long term data (>20 years), indicate that sediments with nutrients cause anoxia, and shows how development is impacting the Bay.

**Bruce Michael (MD DNR)** gave an overview of the June one day workshop; a timeframe of data will be analyzed through 2004, serves a plan for the fall workshop, need to talk to PI's about who are analyzing the data and determine when the analyses can be ready and need to determine if it would be best to revert to a water year rather than using a calendar year, develop an integrated picture of our Bay observations, and focus on what we want for the March ecological assessment.

**Mark Trice and Beth Ebersole (MD DNR) and Ben Longstaff (UMCES)** presented fast track/early priority indicators which include chlorophyll, clarity, and DO need to be done by June. They should be done in a uniform way in which the states are on the same page. The IAN workshop will serve as a place to format indicators and find the correct terminology.

### **CBP Chlorophyll Criteria Team Meeting (May 19, 2005)**

**Tom Malone, Chair (Oceans US)** outlined a number of issues he asked the team to consider during the meeting;

Criteria indicators should characterize both success and impairment.

Must be able to calculate the indicators on the appropriate time and space scales using variables/parameters that are easily and routinely measured currently.

Must put in place validation procedures using existing data.

Need to determine which indicator will be measured based on surface only concentrations or integrated through the water column.

Need to make distinctions between just analyzing chlorophyll a concentration data versus extracting out anomalies (climatologies) in the long term data record.

Need to consider the use of sentinel locations and times in criteria derivation.

Do we develop indicators that are different for each segment/each tidal river versus using an indicator/set of indicators for related sets of segments/rivers.

**Rich Batiuk (EPA CBPO)** asked the team to consider the following in deriving numerical chlorophyll a criteria for the Bay and its tidal tributaries:

The criteria must have a direct, quantitative connection with water quality (DO, clarity, pH) and ecological impairments (hab's, imbalances in the phytoplankton community).

The criteria documentation needs to clearly state the criteria have been derived based not on "cause and effect" relationships but on chlorophyll a concentrations characteristic of the identified water quality and ecological impairments.

The criteria can be based on several collaborative quantitative lines of evidence.

The criteria development methodology must support derivation of seasonal specific criteria.

The criteria attainment methodology needs to address magnitude, duration, return frequency, time and space.

### **Criteria Team Schedule**

**June-December 2005:** Criteria methodology development, derivation of numerical criteria

**Winter 2006:** Drafting of criteria documentation

**Spring 2006:** Independent peer review of the criteria and supporting documentation

**Summer 2006:** Revisions as needed to address comments from the peer review

**Early Fall 2006:** Bay Program approval of the criteria

**Late Fall 2006:** EPA publication of the criteria

**2007-2008:** Bay Program partners application of the numerical chlorophyll a criteria as part of the 2007 re-evaluation; state (MD, VA, DE) adoption of the criteria into their water quality standards regulations.

### **Potential Methods/Approaches for Deriving Numerical Bay Chlorophyll a Criteria**

All of the following presentations can be viewed at:

<http://www.chesapeakebay.net/chlorteam.htm>

**Bill Dennison (UMCES)** reporting chlorophyll criteria through a water quality index. There is a need to effectively communicate the health of the Bay within a chlorophyll a context. Two thresholds were used in the assessment of MD's coastal bays; 15 ug/L for seagrass (based upon SAV minimum light requirements) and 50 ug/L for protection of DO (based on used in MDE's TMDL's). His group has used area based assessment of threshold exceedences to map out a water quality index. The team needs to clearly document the basis of its selected measure of central tendency (mean versus median).

**Tom Fisher (UMCES)** presented correlations with low dissolved oxygen. He recommended the chlorophyll a criteria to be stated as surface concentrations as annual means. His topic relationship seemed to show the chlorophyll a concentration data to be between 2-10 ug/L. The team may get a better coupling of chlorophyll a concentrations and mesozooplankton abundance in oligohaline habitats.

**Chuck Gallegos (SERC)** presented contributions to water column light attenuation. He stated that open water chlorophyll a criteria must be protective of shallow water clarity criteria given the influence/movement of open waters into adjacent shallow water habitats. Larry Sanford

(UMCES) has stated that a value of 7 mg/L total suspended solids could be considered as natural background.

**Larry Harding (UMCES/MD Sea Grant)** presented deriving criteria from the historical chlorophyll a data record/climatology approach. It is important to account for climate when deriving criteria. The lower Bay mainstem is very sensitive to climate driven and flow driven changes over time. Stations in this area could be used as sentinel stations. The chlorophyll a maximum in any given year can extend from region 5 (low flow conditions) down to region 2 (high flow conditions) in the Bay mainstem. In the Bay mainstem, the highest chlorophyll a concentrations are actually in the summer not the spring. During certain times of the year (spring) measuring integrated through the water column would be more appropriate; measurement through surface waters only is more appropriate for other times of the year (summer). Quantifying a wide range of ecological impairments connected to chlorophyll a concentrations is going to be difficult in terms of phytoplankton species; high chlorophyll a concentrations do not always relate to poor quality species; a lot of high chlorophyll a reflect large diatom populations, it really comes down to excess production well above what the ecological system can consume. The team should consider low flow year regional seasonal means as potential attainable chlorophyll a concentrations as derivation of the criteria.

**Elgin Perry (Consultant)** presented a time-space context for assessing adherence to criteria. One could develop a reference curve for the cumulative frequency diagram (CFD) criteria attainment assessment using historical data or more contemporary concentration data during low flow years. Need to factor in consideration of the influence of a Bay ecosystem with more SAV, higher levels of oysters, etc. in deriving a biological reference curve. The team should consider three possible approaches to developing a reference curve for assessing attainment of the chlorophyll a criteria using the CFD approach; 10 percent curve, data drawn from a reference area, or Elgin's proposed model.

**Jonathan Sharp (Univ. DE)** presented chlorophyll a and primary production relationships from Delaware Bay. The mid to lower DE Bay is comparable to the Bay mainstem. Moderate to high chlorophyll a concentrations with higher primary production levels should not be considered problematic; elevated chlorophyll a concentrations become problematic when there is excess phytoplankton biomass not taken up by higher trophic levels. He did not find a strong correlation between primary production and chlorophyll a concentrations in DE Bay. The team should consider primary production within the context of the criteria derivation.

**Hans Paerl (UNC)** presented lessons from the intensive monitoring of chlorophyll a in Pamlico Sound/Neuse River. The CBPO staff needs to follow-up with Hans on determining what specific follow-up analyses of the available Bay phytoplankton pigment measurements and related parameters should be conducted to inform the derivation of criteria.

**Peter Tango (MD DNR)** presented concentrations characteristic of harmful algal blooms in the upper Bay. Peter and Arthur Butt (VA DEQ) will further investigate the published human health/beach closure/swimming advisory levels related to cyanobacteria concentrations and

determine the value of such thresholds in the analysis of cyanobacteria enumeration and chlorophyll concentration data in support of the derivation of the criteria.

**Margie Mulholland (Old Dominion Univ.)** presented concentrations characteristic of harmful algal blooms in the lower Bay. There are significant concerns about the limitations of the existing phytoplankton monitoring programs in assessing HAB's. Some species of HAB's can have toxic effects at low chlorophyll concentrations and have no adverse effect at high chlorophyll a concentrations. Outside of cyanobacteria, there are few if any clear connections between HAB's and chlorophyll a concentrations due to many reasons; variations in toxic versus non-toxic nature of the blooms, lack of chlorophyll a in some HAB species, many other factors that influence HAB blooms, and could have ecological impairments due to HAB's at low and high chlorophyll a concentrations.

**Arthur Butt (VA DEQ)** presented technical basis for tidal James River chlorophyll a criteria. Rich Batiuk will work with each state's water quality standards coordinators to summarize the existing MD, VA, DE, and DC narrative descriptions within each states respective water quality standards regulations that describe the desired ecological conditions for the state's waters. This text will form the part of the introduction of the Bay chlorophyll a criteria document, setting the stage for the types of ecological impairments the numerical criteria must protect against as required in existing state water quality standards regulations.

**Larry Haas (VIMS)** presented findings and implications from decadal chlorophyll a records in the York River. A balanced estuarine ecosystem is one in which you don't have "accumulations" of chlorophyll a. The maximum chlorophyll a was usually observed in the 8-12 ppt salinity range. The spring bloom is an attractive time frame to explore HAB/chlorophyll a connections as well as trophic interactions given the limited influence of grazers and the close connections to nutrient inputs.

### **Team discussion on strengths of the proposed criteria derivation methods**

#### **Potential indicators for use in deriving chlorophyll a criteria**

Light attenuation and meeting minimum light requirements for SAV  
Seasonal low DO conditions/chlorophyll a concentrations  
Episodic/diel low DO conditions/chlorophyll a concentrations  
Phytoplankton diversity indices/chlorophyll a concentrations  
Selected HAB species (Microcystis, cyanos)/chlorophyll a concentrations  
Sentinel sites/seasonal seasons

#### **Recommended salinity-regime based habitats for which criteria should be derived**

Tidal fresh/low salinity (oligohaline)  
Mesohaline (defined as 8-16ppt salinity) vertically mixed  
Mesohaline (defined as 8-16ppt) vertically stratified  
Polyhaline (defined as >16-25ppt salinity)

#### **Recommended data aggregation approaches by indicator**

Cyanobacteria indicators – use surface chlorophyll a concentrations

Light attenuation/SAV minimum light requirements – use surface chlorophyll a concentrations  
Seasonal low DO condition – depth integrated chlorophyll a concentrations  
Episodic/diel low DO conditions – use surface chlorophyll a concentrations  
Climatologies – use both surface and depth integrated chlorophyll a concentrations

### **Recommended temporal data aggregation approaches by indicator**

Cyanobacteria – May to October

Light attenuation/SAV minimum light requirements – March to May as well as SAV growing season (April to October)

Seasonal low DO condition – March to May

Episodic/diel low DO conditions – May to September

Climatologies – was not discussed during the meeting

Set the boundaries application of the different criteria based on evaluation of actual in-situ salinities not physical geography (prefixed segments)

Focus on narrower versus wider temporal window to capture the chlorophyll a peak

The chlorophyll a concentration measures would be integrated over the established temporal application periods.

Factor both spring and summer chlorophyll a concentrations in developing the seasonal low DO conditions indicator.

Need to look into the lag between bloom event/chlorophyll a production and the timing of the ecological impairments.

### **Communications Workgroup Meeting (June 1, 2005)**

**Bob Campell (NPS CBPO CESC Chair)** summarized the Implementation Committee's April 21<sup>st</sup> discussion relating to the communications strategy, indicators redesign, and communication products. The IC agreed that the Bay Program must be timelier in regards to updating and communicating with the public. The IC adopted the overall communication strategy and approved the communications products schedule through November. The IC asked the CESC to work with the Monitoring and Analysis Subcommittee and to quickly analyze any practical difficulties associated with meeting the May through November communications expectations. The IC also tasked the Information Management Subcommittee to work with CESC to develop a management system for improving the timeliness of data submission and subsequent reporting.

The IC also adopted the proposed framework for structuring and organizing the Bay Program indicators, they asked that the indicators not only tell the Bay's story but also that of the entire watershed. The CESC must determine how key data fits into the bigger story of Bay issues and provide context to the public and aid them in understanding the most important points. Finally the IC discussed the dissolving of the Indicators Redesign Taskforce but that some questions/issues must still be resolved by this group, including the "ultimate vision" of the Bay's assessment piece. The Communications Workgroup recommended that the first step may be seeking input and approval by advisory groups such as STAC and Citizens Advisory Committee.

**Chris Conner (Alliance for the Bay, Communications Director CBPO)** provided an overview of the environmental indicators redesign initiative and the associated E-newsletter. The first

Chesapeake Currents was focused on the ecological forecast and launched in May. The June edition followed with a Bay grasses theme, and the July will highlight the blue crabs. Workgroups members endorsed the idea that monthly feature stories should correlate when possible with the critter of the month, Gateway site, and Bay Journal's lead story. Currently there are approximately 50 subscribers to this newsletter, so the workgroup discussed increased marketing efforts through other e-newsletter services and automatically subscribing all CBP subcommittee members.

### **Non-Tidal Water Quality Meeting (June 9, 2005)**

**Scott Phillips (USGS) and Steve Preston (USGS CBPO Monitoring Coordinator)** gave the outcomes of the MASC workshop held on June 2<sup>nd</sup> in Annapolis. The current indicators include stream flow, loads and flow-adjusted concentrations. Possible watershed health indicators to consider are water quality, ecological, and land use. Both January (restoration) and March (Bay health) assessments will include non-tidal data, which means moving up the data analysis. The IMS has been charged with improving data management. If the reporting time frame is water year, which ends in September, there will be a three month window to get the data ready for the December deadline.

**Troy Keller (UMD CBPO)** discussed with the group the progress on environmental indicators to date. He presented the total load to the Bay indicator and his presentation can be found at: <http://www.chesapeakebay.net/calendar.cfm?EventDetails=5543&DefaultView=2>  
The nitrogen index appears to be stable and the method used to calculate the index produces results similar to the HSPF Model. This method works best for nitrogen because phosphorus and sediment indexes are variable. He also worked on the nitrogen flow adjusted concentration trend indicator by adding hydrography to the base map and scaling the size of the symbols by percent change.

**Scott Phillips (USGS)** provided preliminary results from STAC on the network design and data analysis. This was a verbal report and their recommendations for representativeness included looking at different basins and land use and integrating into an index number. Other recommendations included further development of indicators, enhancing the spatial intensity and getting a more independent review of the non-tidal network results.

### **Living Resources Analysis Workgroup (LivRAW) Meeting (June 16, 2005)**

**Peter Bergstrom (NOAA CBPO, LivRAW Co-Chair)** described the charge, primary uses for the products, analysis categories, and staffing of the newly formed CBP workgroup LivRAW. As directed by the Living Resources Subcommittee (LRSC) and working with partners, coordinate Bay living resources data acquisition, data analysis and management, and information products. LivRAW will serve as the LRSC counterpart to the Tidal Monitoring Analysis Workgroup (TMAW) of the Monitoring and Analysis Subcommittee (MASC)., which focuses on water quality data. Planned LivRAW products will cover living resources in both tidal and non-tidal habitats, and will address five main objectives:

1. Characterize the current **status** of Chesapeake Bay living resources (and their trends if possible).

2. Characterize **ecological relationships** among species, between species and their habitats, and especially as needed for Fisheries Ecosystem Modeling.
3. Characterize **responses of living resources to stressors** (water quality, climate, harvest, disease).
4. Characterize the **responses of living resources to management actions** (pollution reduction, habitat restoration, harvest changes).
5. Oversee the development, validation, and routine management of **living resources related indices and indicators**, including any integrated index of Bay ecosystem health.

**Primary uses for the products of LivRAW:**

1. Providing analytical results and interpretation for the planned monthly CBP E-newsletter and associated CBP web site updates, the CBP environmental indicator series, and any other reports (such as the State of the Bay or Bay Journal).
2. Supporting the development and implementation of Fisheries Ecosystem Modeling (FEM) and ecosystem based fisheries management plans (EBFMP).
3. Supporting better decision making on pollutant source quality restoration based on the enhances quantification of the relationships between the Bay's living resources and tidal water quality.

**Examples of likely LivRAW analyses:**

1. Support items for E-newsletter and SAV forecasts.
2. Support and enhance Bay Program indicators that use living resource data, ones that we now have and ones we need to develop.
3. Help acquire data and conduct analyses as needed for EBFMP and fisheries models, especially Ecopath and Ecosim.
4. Show likely living resources results of meeting water quality criteria, for example; how many more acres or volume of habitats for crabs or other target species would be made available if water quality criteria were met.
5. Develop and make available tools to show effects of climate change on trend analyses and related tools.
6. Support development and refinement of Indicators of Biological Integrity (IBI's), starting with plankton and benthos, adding new types of data where possible.
7. Work with the Bay Program stream corridor and fish passage groups on analyses of non-tidal living resources data for non-tidal indicators.
8. Make living resources data and basic analyses of them more readily available.

**Staffing of LivRAW:**

Bob Wood (NOAA Oxford) is the other co-chair, along with Ben Longstaff (UMCES NCBO), Beth Ebersole (MD DNR), Arthur Butt (VA DEQ), Claire Buchanan (ICPRB), Dave Wilcox (VIMS), Howard Weinberg (UMCES CBPO), Jackie Johnson (ICPRB CBPO), Jim Uphoff (MD DNR), Marcia Olson (NOAA CBPO), Margaret McGinty (MD DNR), Paula Jasinski (NOAA CBPO at VIMS), Peter Tango (MD DNR), Xinsheng Zhang (NOAA Oxford).