2014 CBP Watershed Agreement & Forage Workshop

- Sustainable fisheries goal:
  - "Protect, restore and enhance finfish, shellfish and other living resources, their habitats and **ecological relationships** to sustain all fisheries and provide for a balanced ecosystem in the watershed and Bay."
- Forage fish outcome:
  - "By 2016, develop a strategy for assessing the forage fish base available as food for predatory species in the Chesapeake Bay."
- Forage Workshop, Nov 2014 (sponsored by STAC)
  - What are the key forage species (or groups) in the Bay?
  - How do we quantify and monitor the status of these groups?
  - How can such information be used in management decisions?

Ihde et al. 2015

The Most Important Forage in the Chesapeake Bay

Key Forage Groups*	Additional Important Forage Groups (alphabetical)
Bay Anchovy	American Shad & River Herrings
Polychaetes	Atlantic Rock Crab
Mysids	Atlantic Silverside
Amphipods and Isopods	Blackcheek Tonguefish
Mantis Shrimp	Blue Crab
Spot	Flounders
Weakfish	Gizzard Shad
Sand Shrimp	Kingfish
Atlantic Croaker	Lady Crab
Razor Clams	Macoma Clams
Atlantic Menhaden	Mud Crab
	Mummichog & Killifishes
	Small Bivalves**

* Analysis based on ChesMMAP data
** other than *Macoma spp.* or Razor clams

The Most Important Forage in the Chesapeake Bay

Key Forage Groups*	Additional Important Forage Groups (alphabetical)
Bay Anchovy	American Shad & River Herrings
Polychaetes	Atlantic Rock Crab
Mysids	Atlantic Silverside
Amphipods and Isopods	Blackcheek Tonguefish
Mantis Shrimp	**Blue Crab**
Spot	Flounders
Weakfish	Gizzard Shad
Sand Shrimp	Kingfish
Atlantic Croaker	Lady Crab
Razor Clams	**Macoma Clams**
Atlantic Menhaden	Mud Crab
	Mummichog & Killifishes
	Small Bivalves**

* Analysis based on ChesMMAP data
** other than *Macoma spp.* or Razor clams

Recommendations

- Strategic review and data-mining of all available current data to support forage quantification
- Re-establish zooplankton monitoring to develop an index of feeding conditions for key forage (e.g., Bay Anchovy, Menhaden) and to develop abundance indices for key forage taxa (e.g.,mysids)
- Develop a standard set of metrics and indicators (including proxies until direct information is available) to track forage abundance; use these to set targets and thresholds for triggering management actions
- Relate forage trends to predator trends
- Improve understanding of forage dynamics & trends, especially those with limited or no current data (e.g., mysids), both at a system-scale and at specific habitat-scale
- Establish shallow water monitoring in soft-bottom, marsh, and SAV habitats (to complement long-term seine and B-IBI monitoring surveys); including up-tributary habitats
- Expand diet studies that broadly cover predator ages and sizes
- Estimate predator demand and forage supply by habitat. Utilize models as well as monitoring data
- Determine (or summarize available information) prey nutritional quality; relate to nutritional needs of key predators
- Need for habitat-focused management to facilitate management of forage species; implicit in this need, is an understanding of habitat use by key forage groups
- Need for educational video & web-based materials that show the importance of forage, i.e., change the view that "forage is just bait and it doesn't matter"

Recommendations

- Strategic review and data-mining of all available current data to support forage quantification
- Re-establish zooplankton monitoring to develop an index of feeding conditions for key forage (e.g., Bay Anchovy, Menhaden) and to develop abundance indices for key forage taxa (e.g.,mysids)
- **Develop a standard set of metrics and indicators (including proxies until direct information is available) to track forage abundance; use these to set targets and thresholds for triggering management actions**
- **Relate forage trends to predator trends**
- Improve understanding of forage dynamics & trends, especially those with limited or no current data (e.g., mysids), both at a system-scale and at specific habitat-scale
- Establish shallow water monitoring in soft-bottom, marsh, and SAV habitats (to complement long-term seine and B-IBI monitoring surveys); including up-tributary habitats
- Expand diet studies that broadly cover predator ages and sizes
- **Estimate predator demand and forage supply by habitat. Utilize models as well as monitoring data**
- Determine (or summarize available information) prey nutritional quality; relate to nutritional needs of key predators
- Need for habitat-focused management to facilitate management of forage species; implicit in this need, is an understanding of habitat use by key forage groups
- Need for educational video & web-based materials that show the importance of forage, i.e., change the view that "forage is just bait and it doesn't matter"