USGS
science for a changing world

Overview of expanded USGS Status and Trends efforts: compilation and analysis of additional monitoring data to describe change

Ken Hyer, USGS Assoc Chesapeake Coordinator

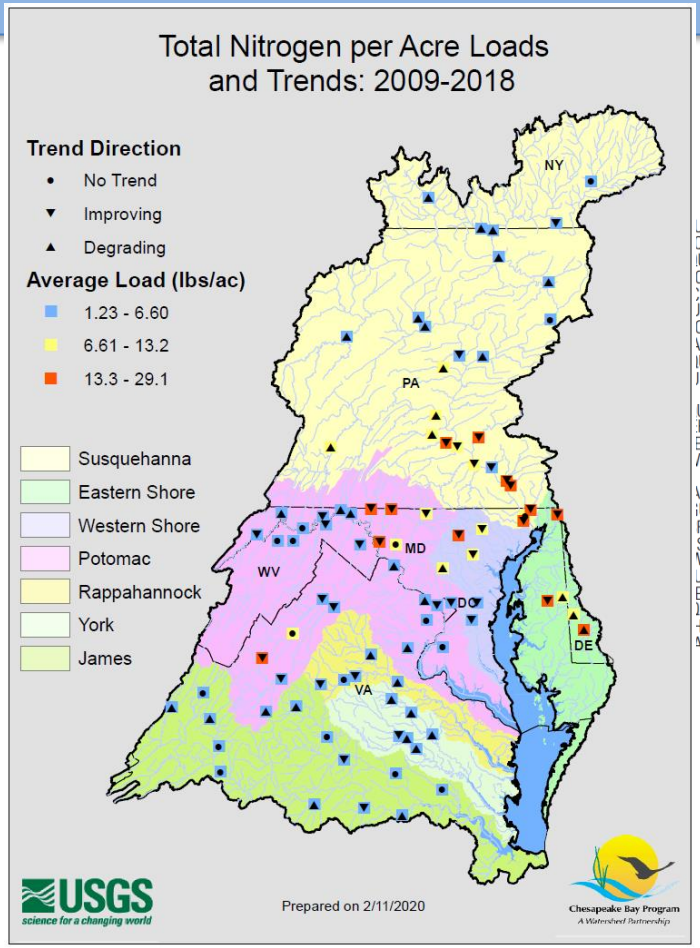
October 25, 2021

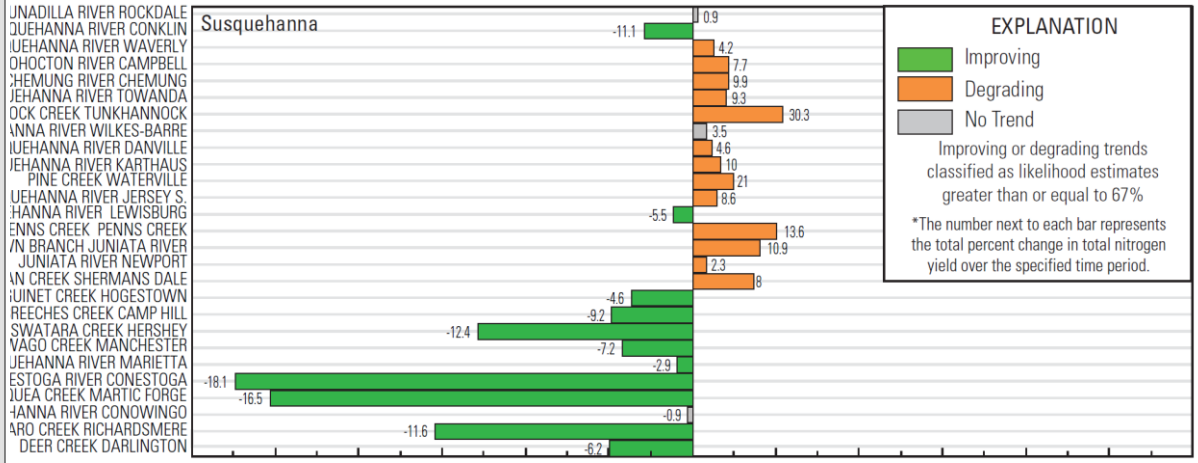
Goal: **Overview of the available nontidal monitoring data sets from the USGS Status and Trend effort that:**

1. **You may not know about**
2. **Could be used to inform water quality and co-benefits modeling in the phase 7 model.**

U.S. Department of the Interior
U.S. Geological Survey

Overview of the Nontidal Monitoring Network (NTN): monitoring and analysis

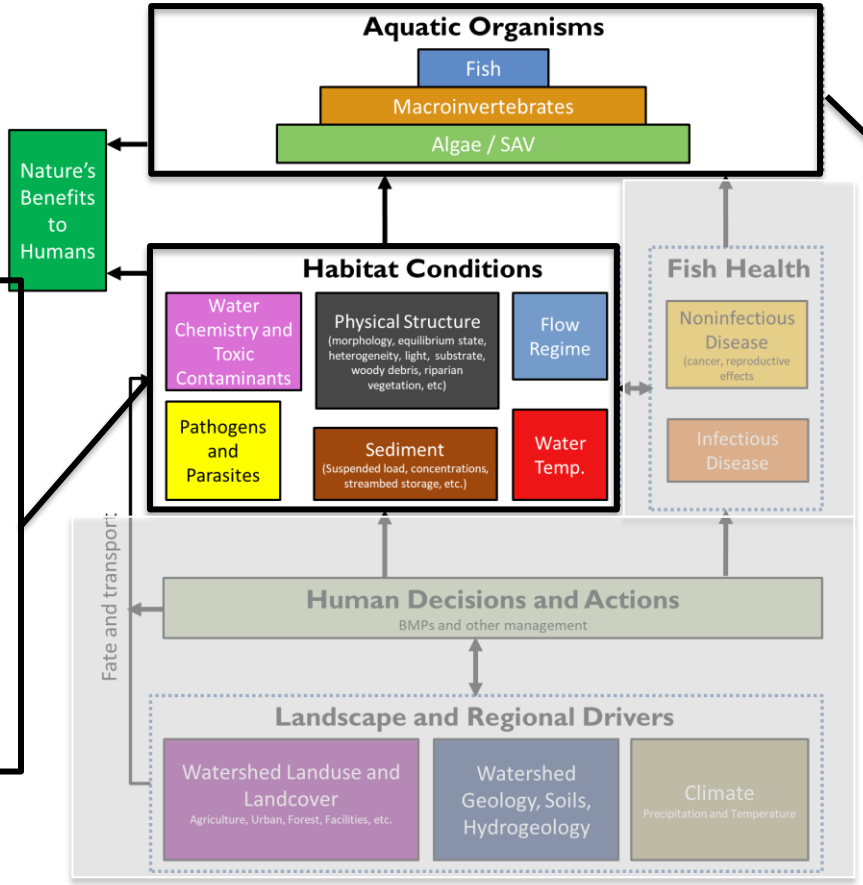




Conceptual model for explaining change of stream health, fish habitat, and aquatic conditions in relation to stressors and management activities

Theme 1: Status and Trends

Stressors –
- Q/Ecological Q
- Water Temperature
- Water Quality
- Toxic Contaminants
- Specific Conductance
- Channel Geomorphology



Aquatic Communities:
- Fish
- Benthic Macro Invert.

USGS

USGS Status and Trends effort

Tasks and Timeline:

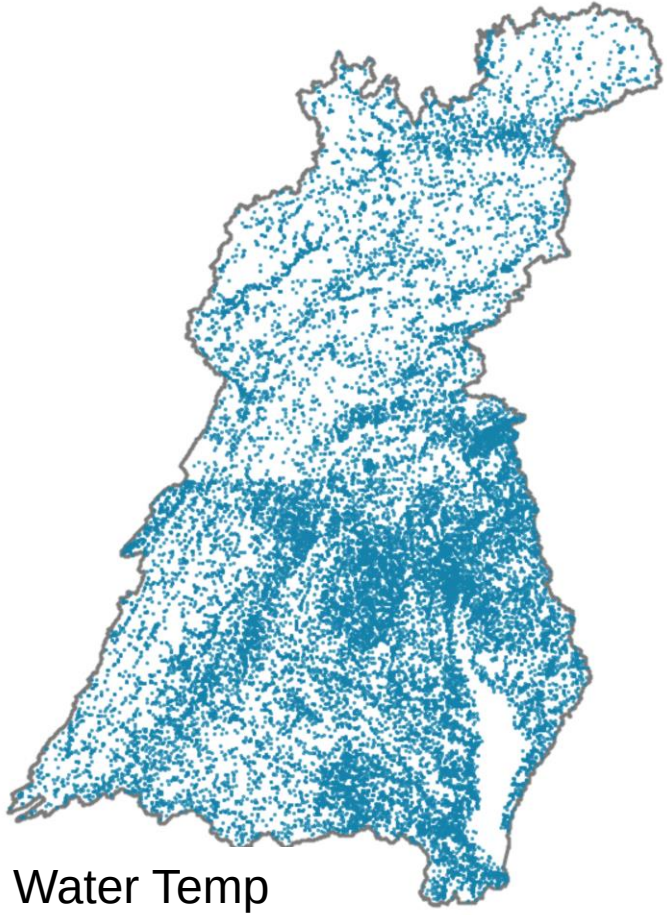
- What data are available for inclusion that represent stream health, fish habitat and fish health? FY2020-21

- What variables have data sufficient for computation of status and trends and are relevant to Chesapeake Bay Management and Researchers?
  - What variables should be represented by Status and Trend? FY2022
  - What is the best statistical approach to determine Status and Trend?

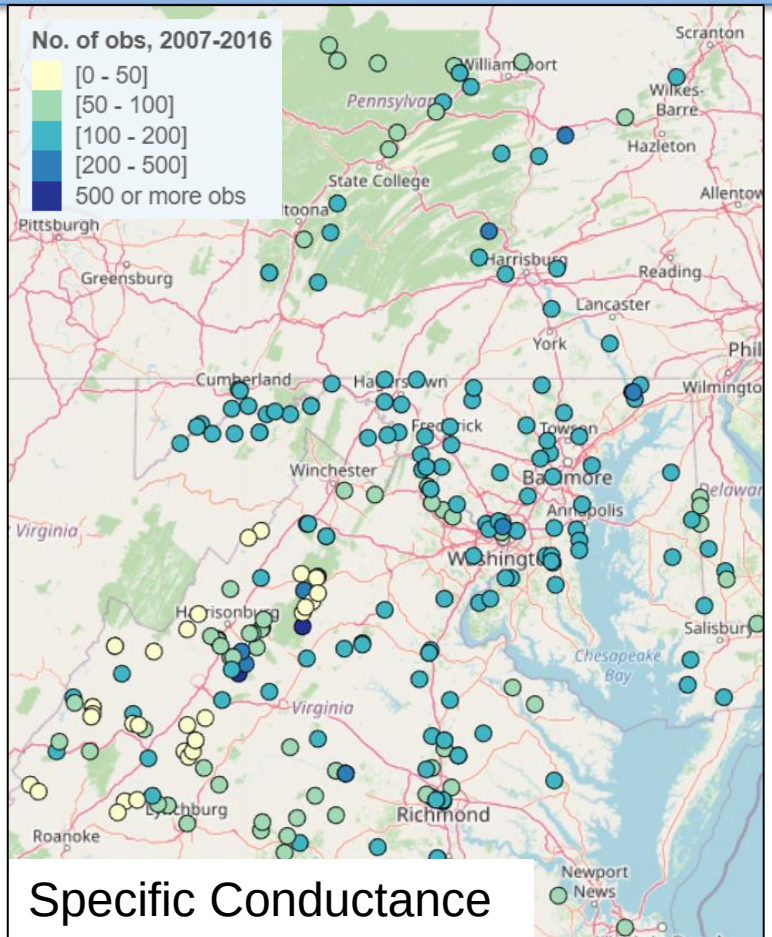
- Communicate results and implications for management FY2023

USGS

USGS Status and Trends effort:
Variability between domains



Water Temp



Specific Conductance

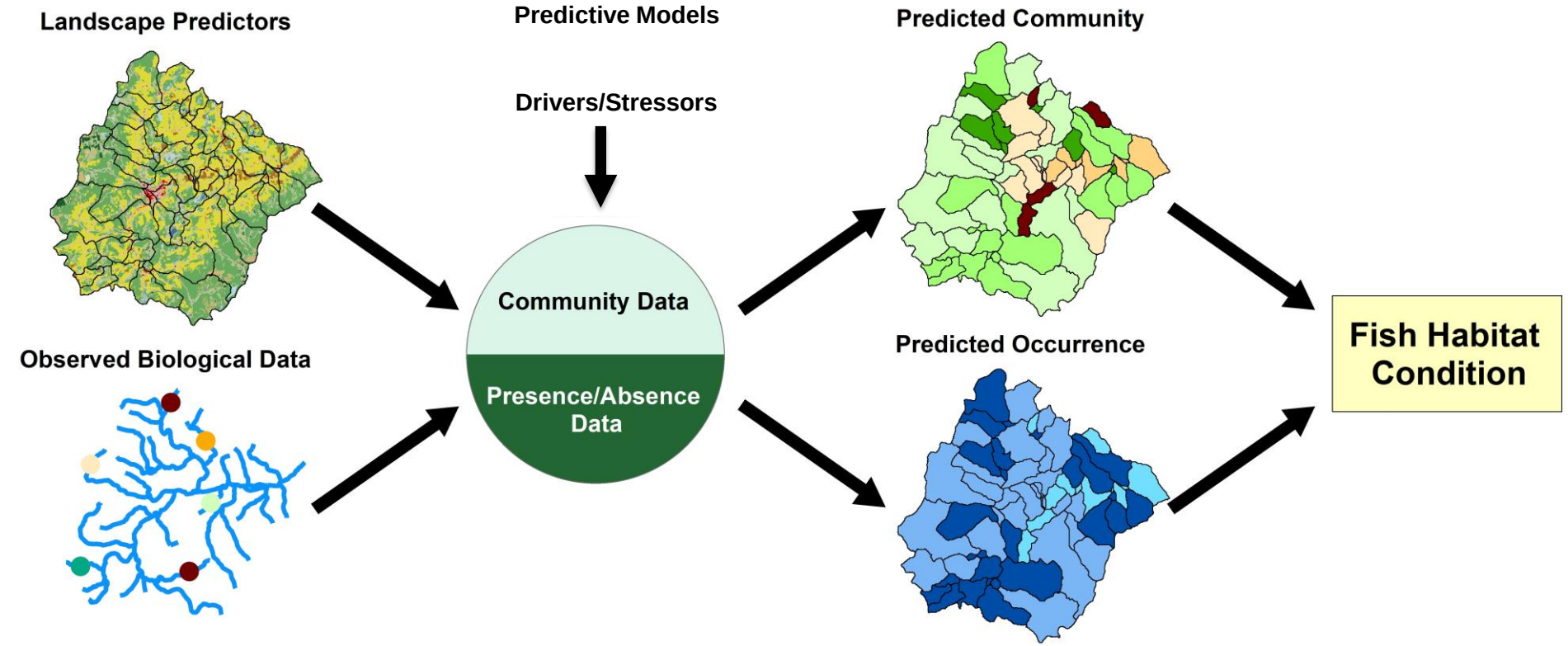
USGS Status and Trends effort

Definitions:

- **STATUS** – Numerical representation of "Current" condition for Response (Habitat, Health, …) and/or Stressor (Q, WT, …) variables for a given time period.
  - **Aquatic Communities** – *Richness, diversity, abundance of specific species.*
  - **Water Temp** – *Mean annual, Mean Monthly (could be represented by min/max…)*
  - **Discharge** – *1-, 7-, 30- day, min, max, mean, median*
  - **Water Quality** – *Loads (represented as a yield)*
  - **Specific Conductance** – *Mean/Median Annual/Season SC, deviation from expected, and duration*
  - **Geomorphology** – Predicted physical habitat score, channel disturbance, channel dimensions
- **TREND** – Statistical determination of change in status for a given time period

USGS

Predictive modeling and co-benefit possibilities



USGS

USGS Status and Trends Effort – Technical Contacts

1. **Aquatic Communities** – Fish and Benthic Macroinv. (Krause, Chambers, Maloney)
2. **Ecological Flow** at Gaging Stations(Mason/Austin) and as predicted by Phase 6 Chesapeake Bay Watershed Model (Chanat)
3. **Water Temperature -** (Clune)
4. **Water Quality** – Nutrients and Suspended Sediment (Moyer)
5. **Toxic Contaminants** – PCBs, Pesticides, and Mercury (Majcher)
6. **Specific Conductivity –** (Fanelli)
7. **Geomorphology** – Instream rapid bioassessment data (Cashman)

USGS

Ken Hyer: kenhyer@usgs.gov
Scott Phillips: swphilli@usgs.gov