



DRAGONFLY MERCURY PROJECT

ENGAGING CITIZENS IN RESOURCE CONSERVATION

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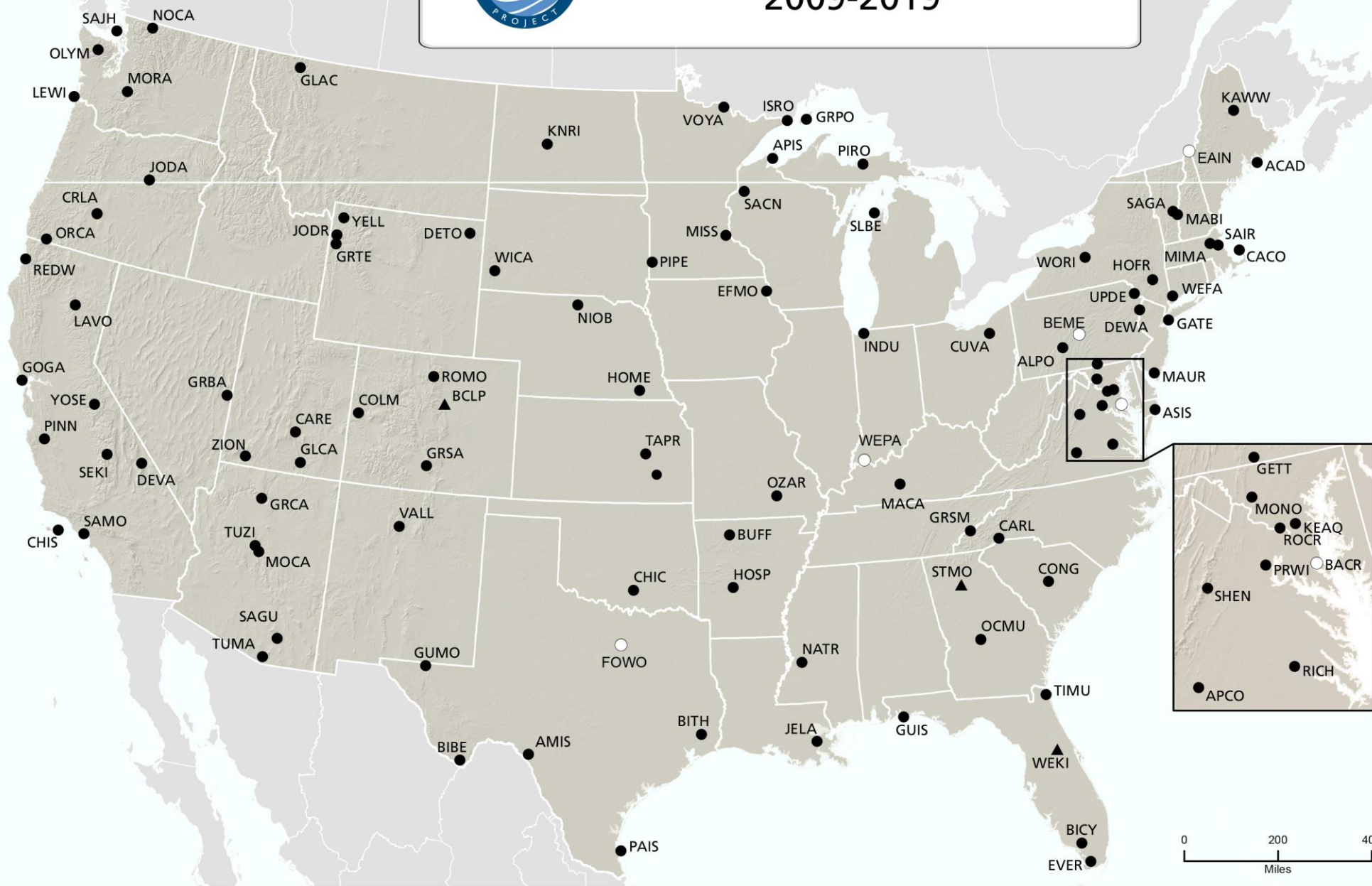
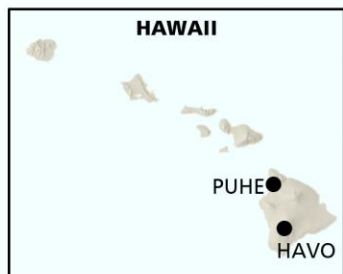
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Federal Community of Practice on Crowdsourcing and Citizen Science,
FedCCS: September 26, 2019



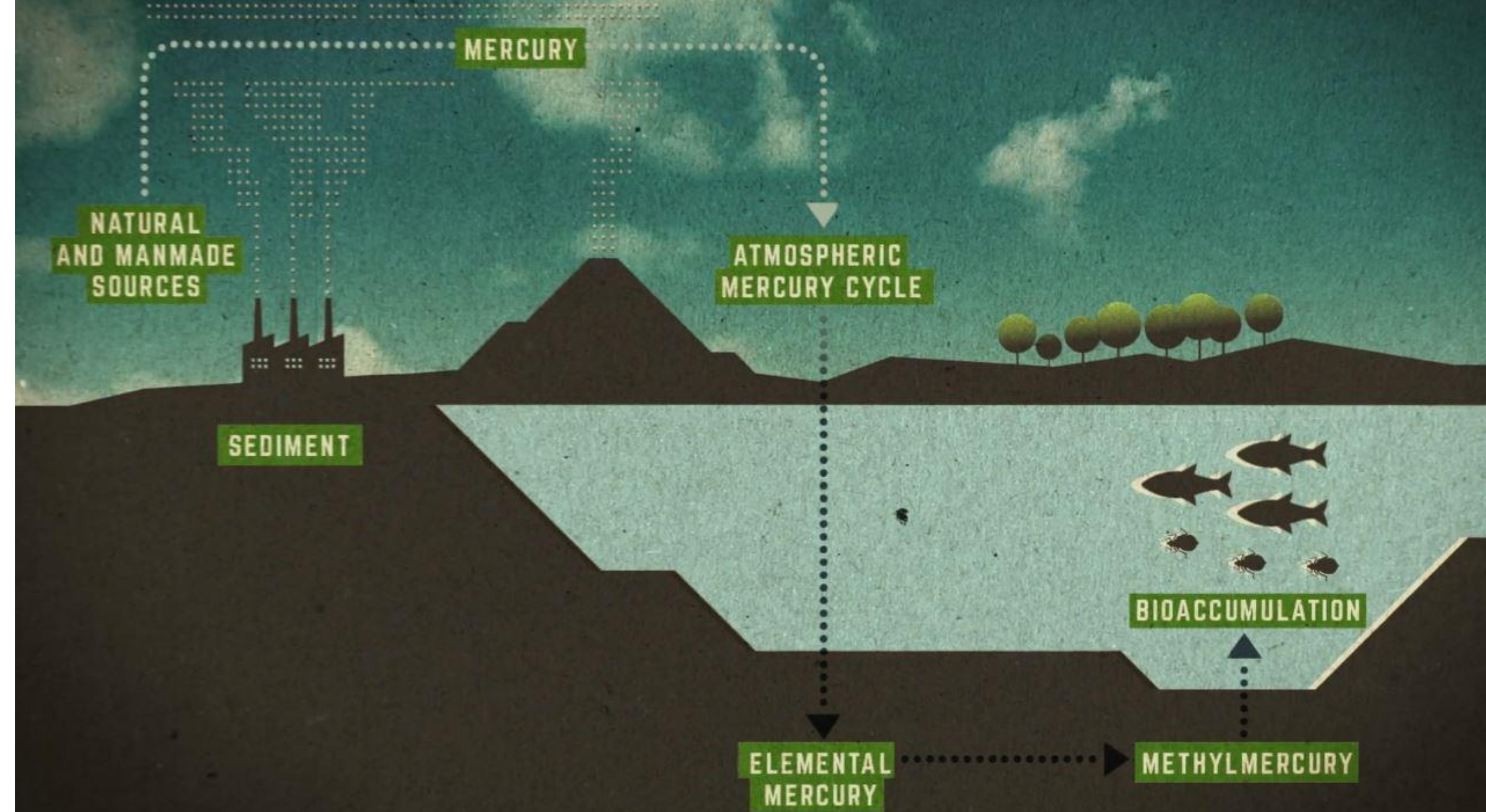


Dragonfly Mercury Project 2009-2019



- NPS Sites
- NNL Sites
- ▲ Non-NPS Sites





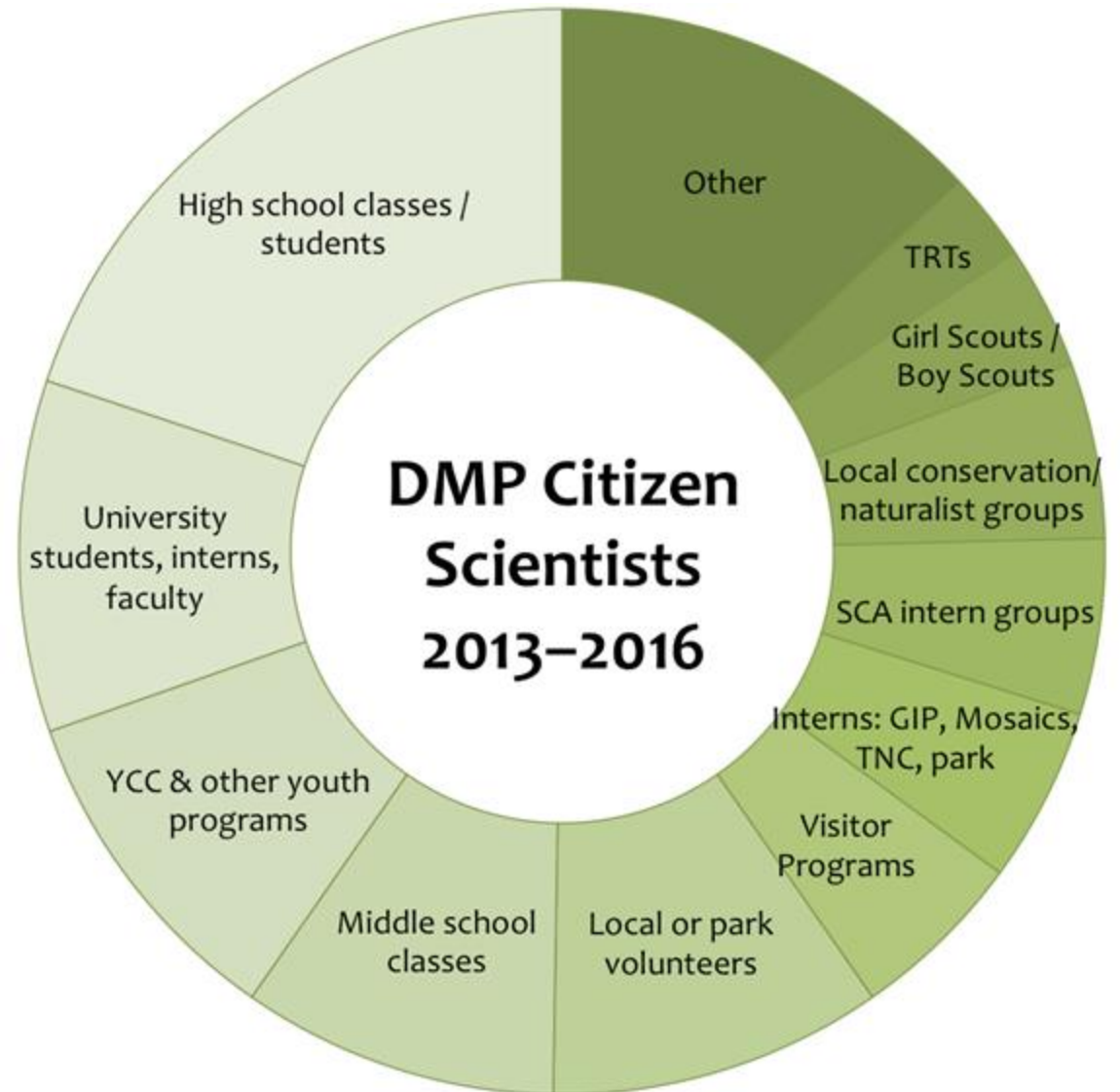
A brown bear with thick, shaggy fur is standing in shallow, rippling water. The bear is looking down towards a salmon that is jumping out of the water in the lower right corner. The water is a mix of light blue and white, with some splashing around the bear's legs.

Atmospheric Mercury Deposition

MERCURY CAN BUILD UP IN THE FOOD CHAIN HARMING WILDLIFE AND PEOPLE

PUBLIC PARTICIPANTS: KEY TO PROJECT'S SUCCESS

OVER 5,000 PARTICIPANTS TO DATE



CITIZEN ENGAGEMENT: GLEN CANYON NRA (AZ)



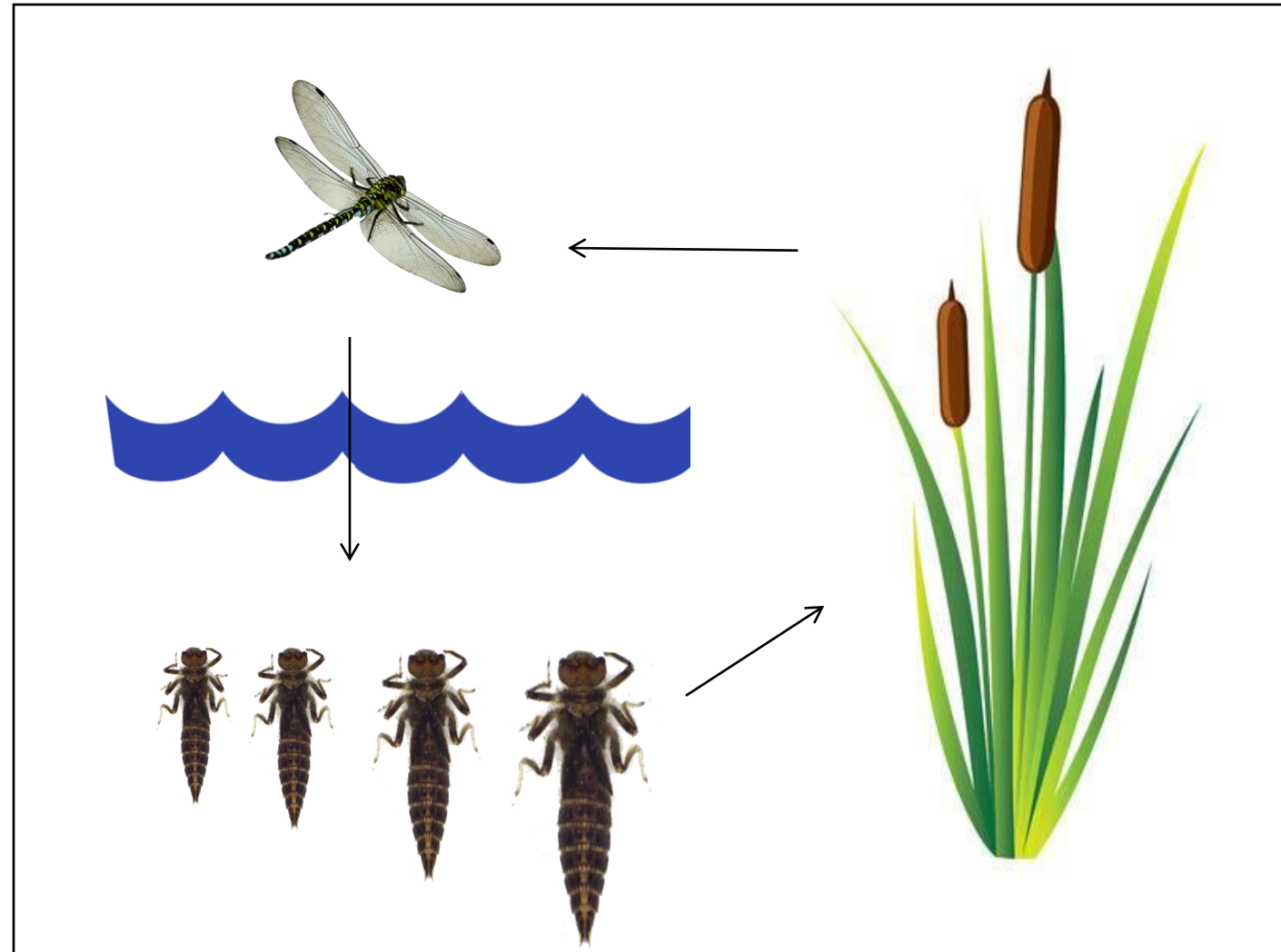
CITIZEN ENGAGEMENT: SHENANDOAH NP (VA)



CITIZEN ENGAGEMENT: GREAT SMOKY MTNS NP (NC)



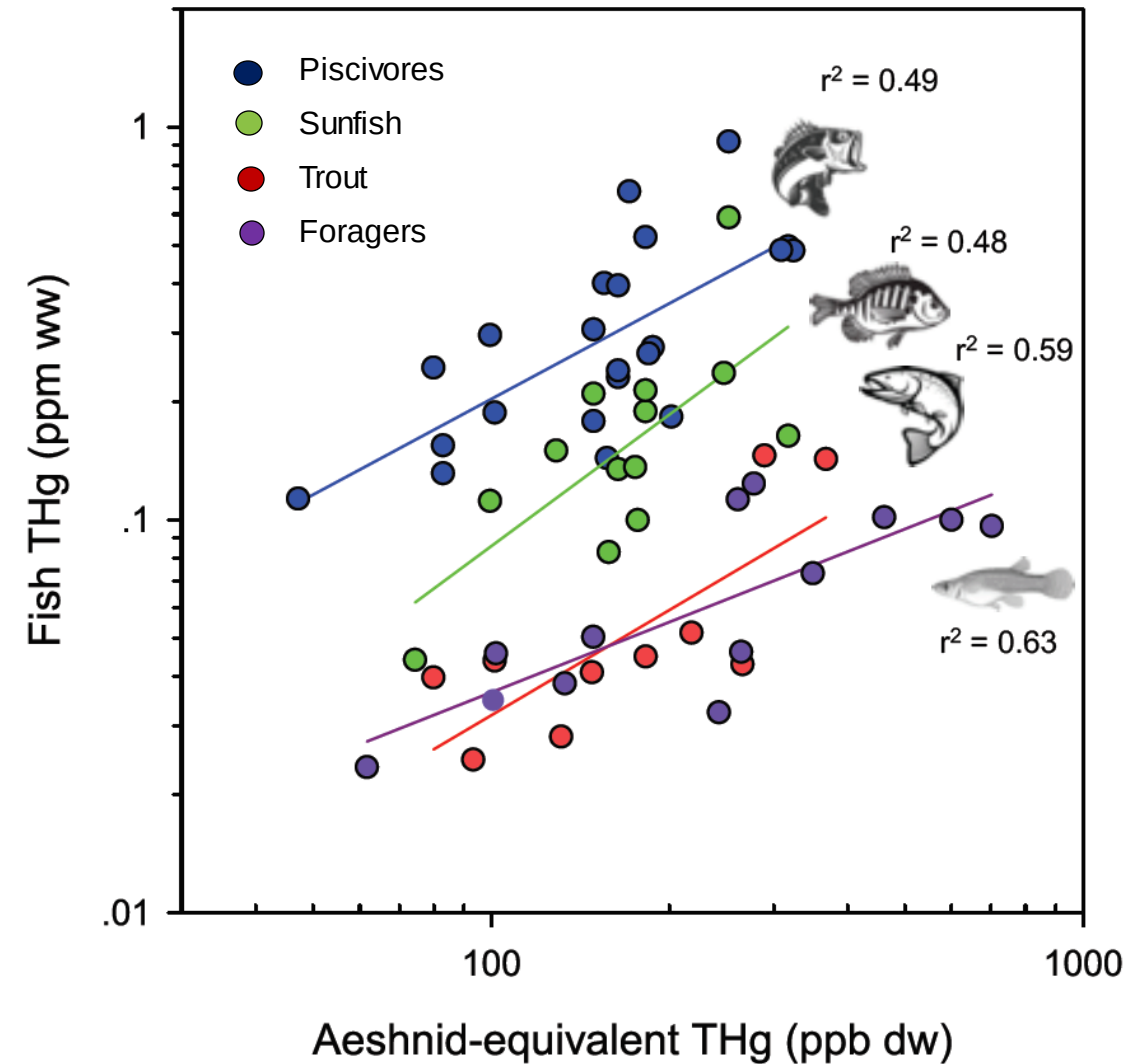
DRAGONFLY LIFE CYCLE



POSITIVE CORRELATION BETWEEN DRAGONFLY HG CONCENTRATIONS AND HG CONCENTRATIONS IN FISH

HG: MERCURY

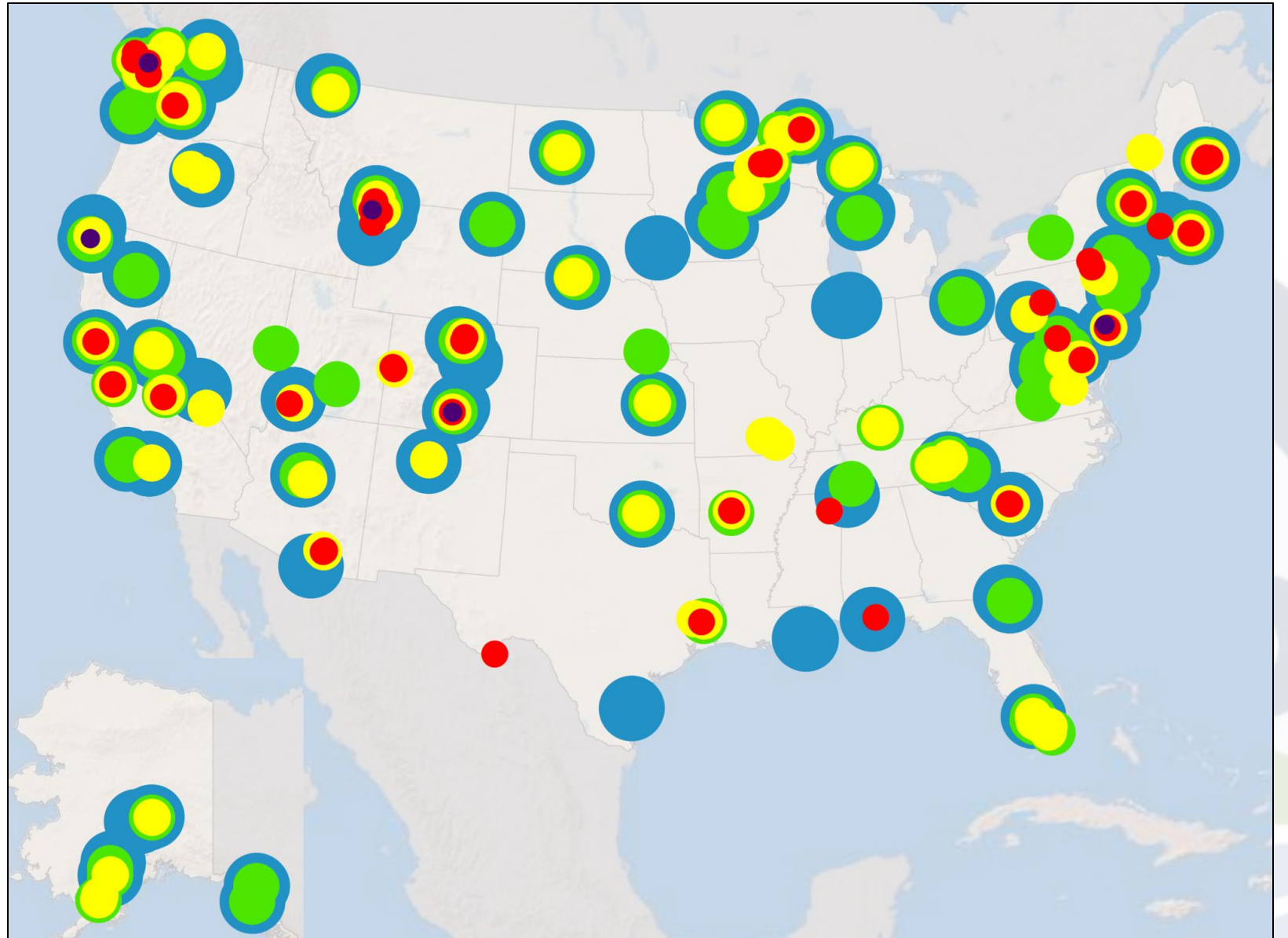
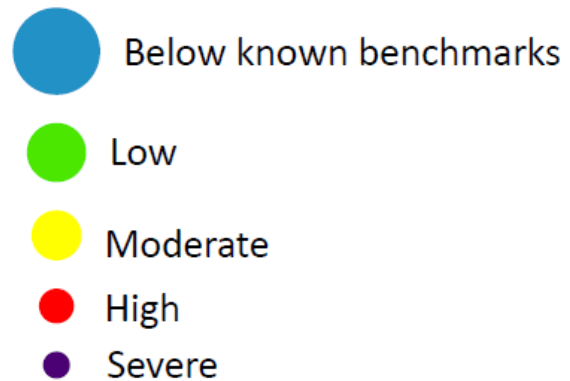
THG: TOTAL MERCURY



SITE-SPECIFIC INTEGRATED HG RISK ESTIMATES

2014-2017

Integrated risk categories



KEY FINDINGS



- COUPLING CAREFULLY DESIGNED CITIZEN SCIENCE EFFORTS WITH HIGH-QUALITY, CENTRALIZED LABORATORY ANALYSES CAN FACILITATE INQUIRY ON ISSUES OF CONSERVATION SIGNIFICANCE THAT WOULD BE OTHERWISE DIFFICULT TO CONDUCT BECAUSE OF LANDSCAPE-SCALE RESOURCE REQUIREMENTS.
- DRAGONFLY LARVAE CAN BE UTILIZED AS ROBUST BIOINDICATORS ACROSS A BROAD LANDSCAPE AND DIVERSE HABITATS IN ORDER TO MEASURE RESPONSES TO CHANGES IN ENVIRONMENTAL Hg AVAILABILITY AND ESTIMATE POTENTIAL HEALTH RISKS ACROSS A RANGE OF RELEVANT ENDPOINTS.

“HOOKS” TO INCREASE RELEVANCY



RISK QUANTIFICATION

MANAGEMENT SOLUTIONS

EFFECTIVENESS EVALUATION

CITIZEN SCIENCE EXPERIENCE

AGGREGATE PICTURE OF HG



ROCKY MOUNTAIN NATIONAL PARK, CO (2019)



Acknowledgements

USGS-NPS Water Quality Partnership; USGS Environmental Health Mission Area Contaminant Biology Program; University of Maine-MAFES and Faculty Research Funds; NPS Washington Office and Natural Resource Stewardship & Science Directorate, NPS staff at national parks, networks, regions, and Research Learning Centers who either assisted or funded field sampling efforts; National Park Foundation; Appalachian Mountain Club; David Krabbenhoft (USGS), Celia Chen (Dartmouth College), Roger Haro (UW LaCrosse), Megan Hess (UMaine), Colleen Emery (USGS), Abe Miller-Rushing (NPS), Kat Ko (GIP), Hannah Webber (Schoodic Institute); Amanda Klemmer (UMaine), and greater than 4,022 dedicated citizen scientists.

Project Web Page

<https://go.nps.gov/dragonflymercury>

