Impediments to eDNA method adoption

Susie Theroux
Principal scientist
Biology Department

Report out: CTAG eDNA Workshop

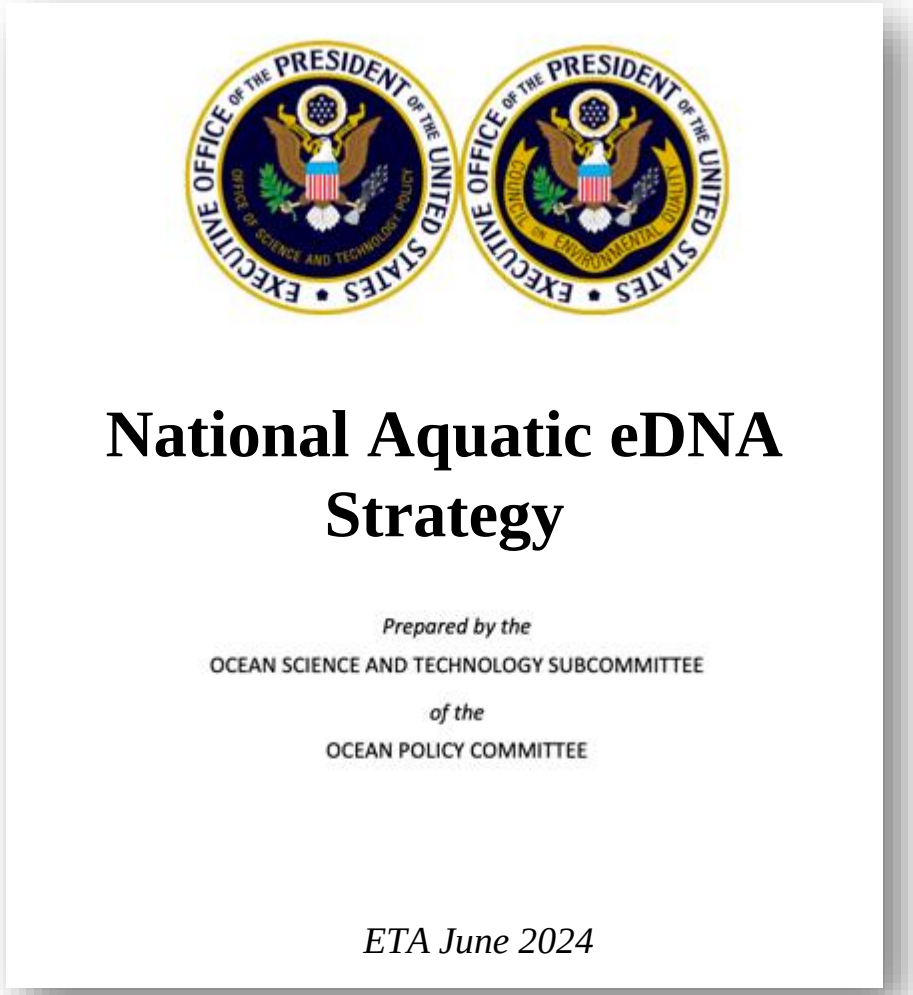
- ✓ **eDNA methods are coming**
  - ✓ Member agencies already piloting
  - ✓ Method adoption for key applications
- ✓ **The Workshop helped to clarify what the needs are to advance method adoption**
  - ✓ Implementation >> Technical
- ✓ **The Commission has a unique opportunity to shape how these methods are developed at the national level**

Background and Motivation

- SCCWRP has been working on developing the science of eDNA for 20 years
- Both in California and nationally, we have reached an inflection point of transitioning from research to application
- This transition was the focus of the 2022 Marine eDNA Workshop held at SCCWRP
- After the Workshop, an eDNA Task Team was formed to develop a **National Aquatic eDNA Strategy**

National Aquatic eDNA Strategy

- The White House Office of Science and Technology Policy has formed an eDNA Task Team to develop a **National Aquatic eDNA Strategy**
- This National Strategy will be used to help coordinate and accelerate eDNA methods development among federal agencies
- There was a Request for Information (RFI) open for public comment on the Strategy
- **This provided a great opportunity to help shape research priorities at a national scale**



Goals for Workshop

- **Identify strategies and SCCWRP work elements** to help overcome impediments to adoption of eDNA tools and to facilitate the application of eDNA across agency programs

- **Generate ideas for responding** to Request for Information (RFI) on National eDNA strategy

- **Outline a joint CTAG-SCCWRP manuscript** on overcoming impediments to using eDNA to support water quality management decisions

Workshop overview

Presentations to orient the group

Conceptualizing the potential eDNA applications

Breakout sessions to identify biggest impediments to adoption

Presentation: National Strategy

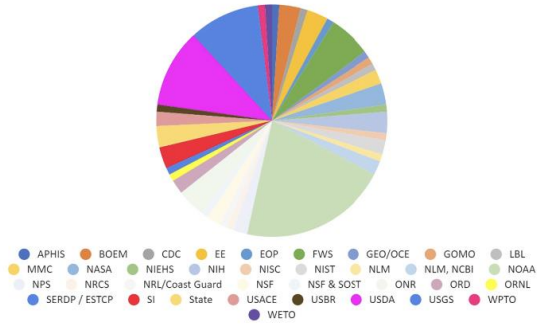
Draft National Aquatic eDNA Strategy

KD Goodwin, NOAA - Kelly.goodwin@noaa.gov
for the eDNA Task Team of Biodiversity Interagency Working Group under the Subcommittee on Ocean Science and Technology (SOST)
IOOS 10/22/2023

Agency Hubs & Spokes

35 Agencies:

- NOAA, Smithsonian, ONR
- USGS, EPA, Army Corp, NIH-NCBI, NSF, OSTP, SOST
- BOEM, Bureau of Reclamation, CDC, DOD, DOE, DOI, FWS, MMC, NASA, NIST, NPS, State Department USDA, USFS, MMC
- **Engagement with >100 FTEs**

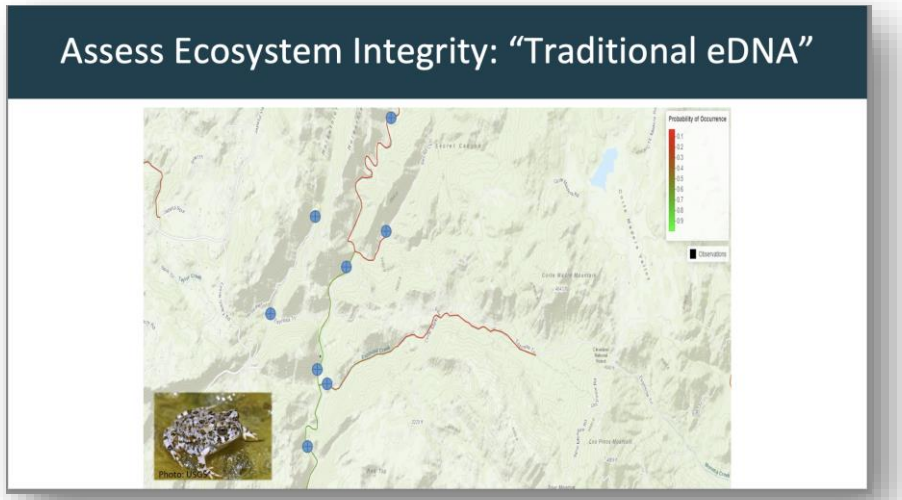


The Strategy: Three Goals (Draft)

- **Coordinate and Communicate** Efforts to Integrate eDNA Methods into Decision Making
- **Build Capacity, Infrastructure, and the Research Enterprise** Needed to Employ eDNA Technology at Large Scale
- **Characterize Aquatic Life in U.S. Waters**

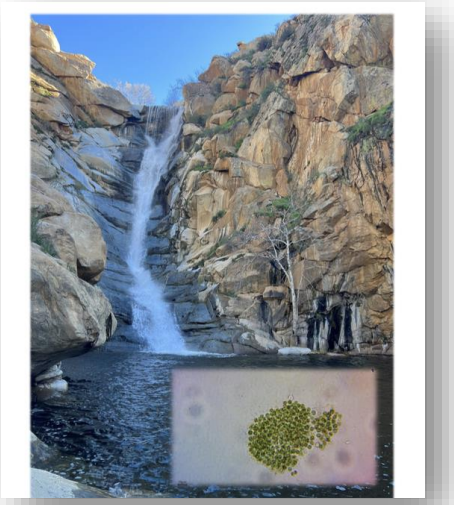
Presentations: eDNA applications

eDNA for invasive/endangered



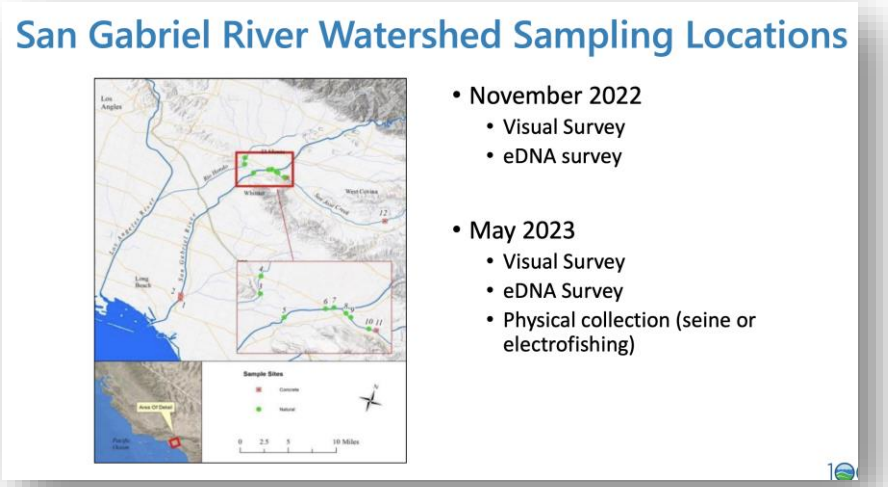
Chad Loflen
SD Regional Water Board

eDNA for HABs



Emily Duncan
LA Regional Water Board

eDNA for fish biodiversity



Josh Westfall
LA County Sanitation Districts

Outcomes of the Workshop

- Key hurdles to eDNA method adoption are related to implementation:
  - **Lack of standardized protocols** and lab accreditation procedures
  - **Lack of capacity** (both technological and workforce) to collect and analyze eDNA samples
  - **Lack of decision support tools** to help users determine eDNA method “readiness”

SCCWRP eDNA Research Plan

Implementation

- Standardization
  - Molecular Methods Workgroup
  - Intercalibration
- Capacity building
  - Training
  - eDNA automated sampling
- Decision support tools
  - Method readiness

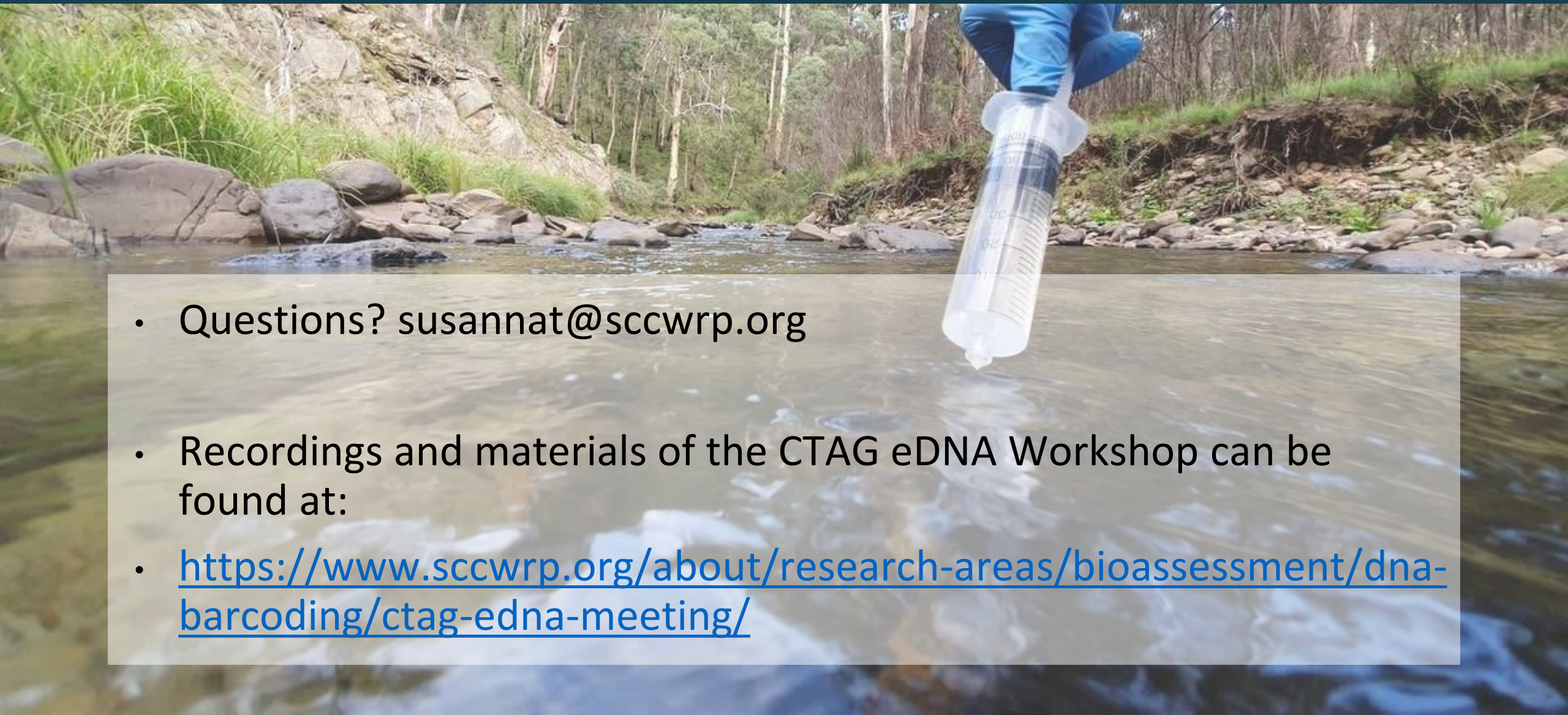
Technical needs

- Space/time resolution
  - eDNA decay studies
- DNA reference libraries
- Scoring tools
  - mASCI, gAMBI
- Live/dead
- Toxin on/off

Next steps

- National Strategy RFI responses:
  - SCCWRP submitted responses to RFI
  - SCCWRP member agencies have submitted responses
- CTAG + SCCWRP now working on a joint manuscript to summarize outcomes from the Workshop
- SCCWRP now has greater clarity on research directions

Thanks!



- Questions? susannat@sccwrp.org

- Recordings and materials of the CTAG eDNA Workshop can be found at:
- https://www.sccwrp.org/about/research-areas/bioassessment/dna-barcoding/ctag-edna-meeting/