Nearshore Action Plan Update

TRPA ADVISORY PLANNING COMMISSION
AGENDA ITEM NO. V.B
NOVEMBER 8, 2017

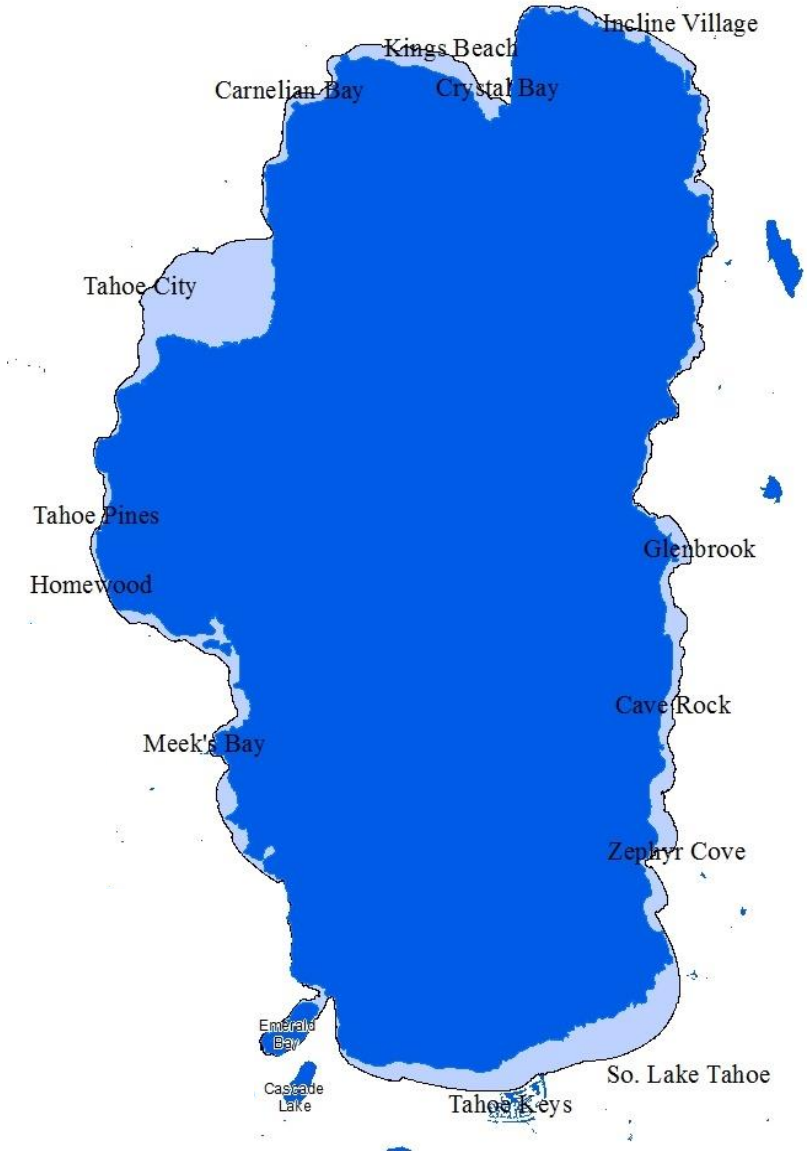
NEARSHORE AGENCY WORKING GROUP

Presentation Outline

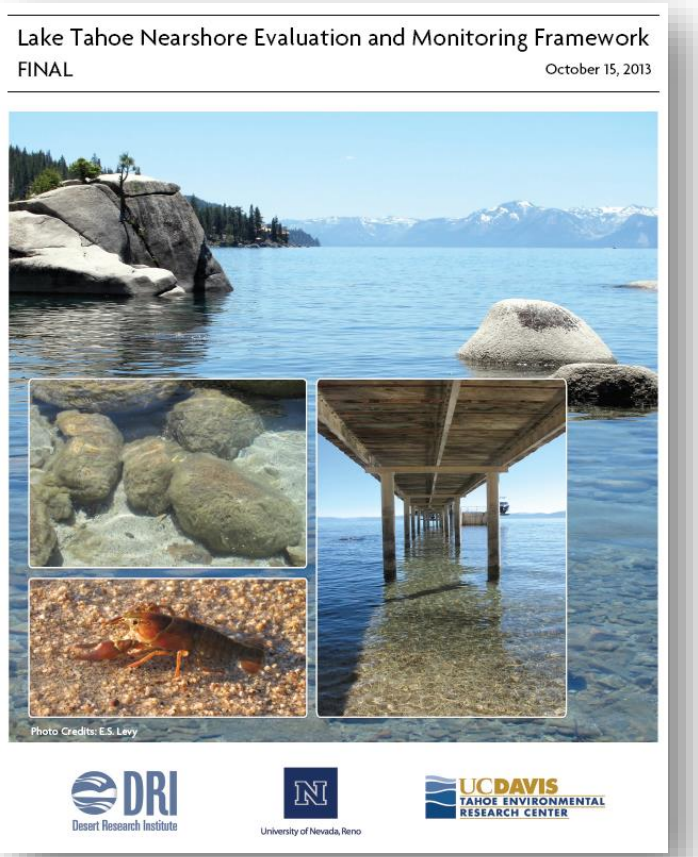
Nearshore indicator status

Nearshore resource allocation program review

"The nearshore of Lake Tahoe extends lakeward from the low water elevation to a depth of 30 feet, or to a minimum width of 350 feet"



Nearshore Agency Working Group



Objectives

Indicators

Metrics

Ecology And Aesthetics

Human Health

Clarity

Trophic Status

Community Structure

Human Health

Turbidity

Transmissivity

Chlorophyll

Phytoplankton

Periphyton

Macrophtyes

Macroinvertebrates

Fish

Harmful Microorganisms

Toxins

Source: Heyvaert, A. et al. 2013. Lake Tahoe Nearshore Evaluation and Monitoring Framework (v10.e).

Nearshore Clarity

Circuit based monitoring

- Five complete circuits completed between November 2014 and November 2015
- No single measurement exceeded the 1 NTU standard

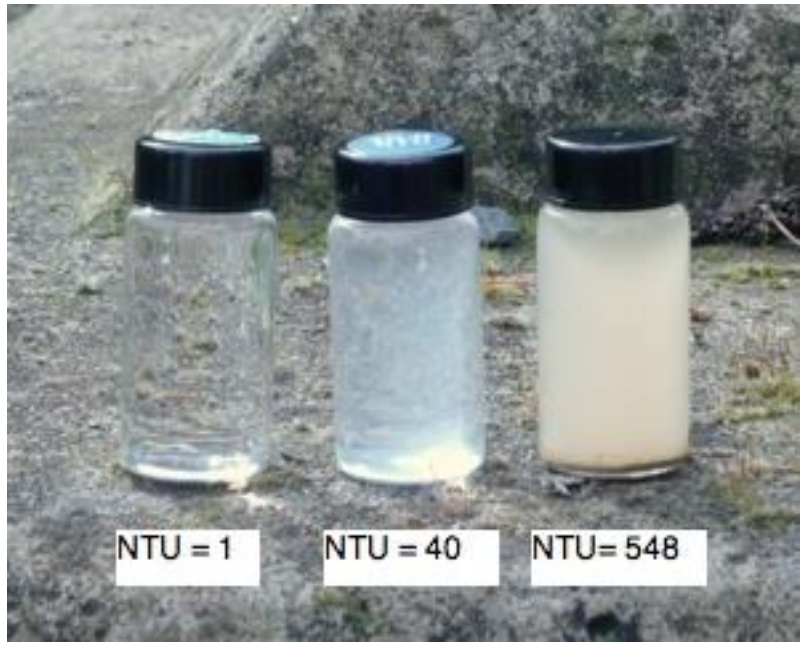
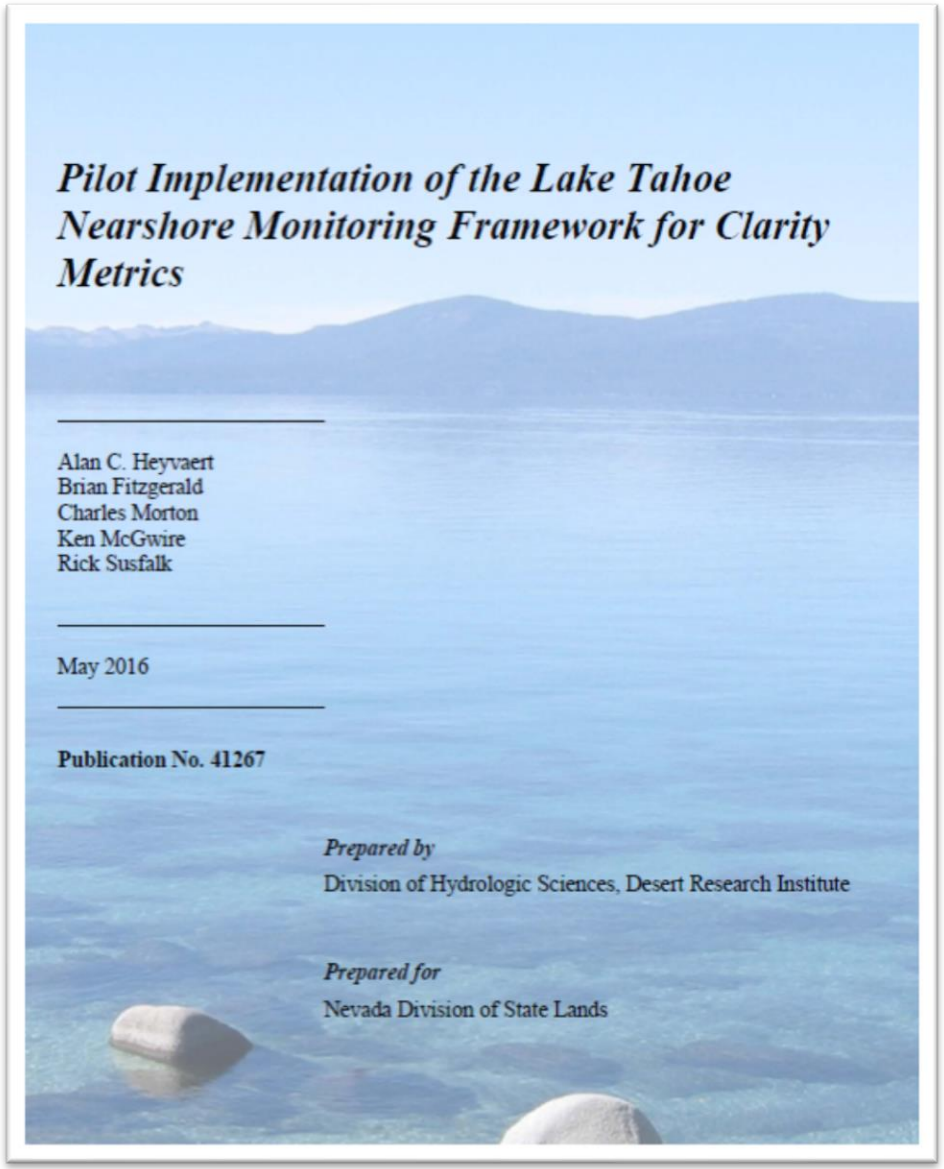


Photo credit: http://www.pavementinteractive.org/


Pilot Implementation of the Lake Tahoe Nearshore Monitoring Framework for Clarity Metrics

Alan C. Heyvaert
Brian Fitzgerald
Charles Morton
Ken McGwire
Rick Susfalk

May 2016

Publication No. 41267

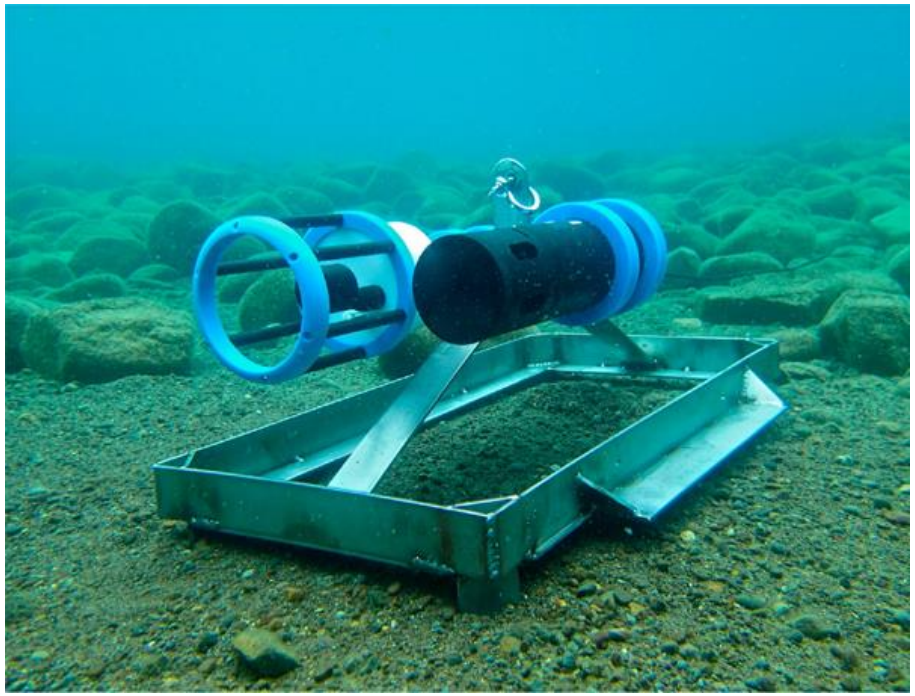
Prepared by
Division of Hydrologic Sciences, Desert Research Institute

Prepared for
Nevada Division of State Lands

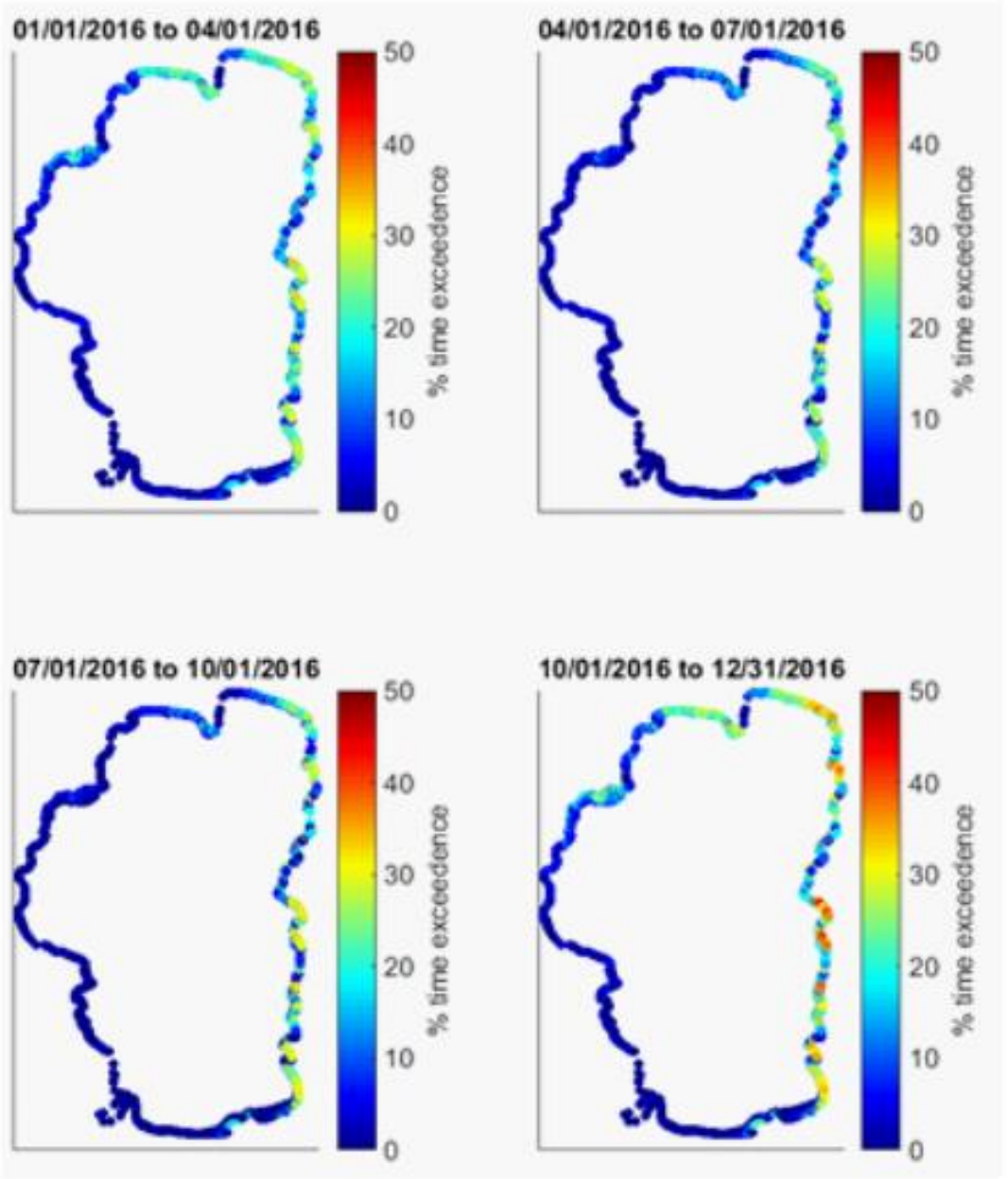
Nearshore clarity

UC-Davis continuous monitoring

Water Board funding two stations on south shore (13 stations out of approx. 20 proposed)



Source: 2017 State of the lake



Percentage of time that turbidity exceeds 1 NTU near the sediment bed, at a depth of 7 ft.

Nearshore Clarity – Next Steps

Continuous	Analyze real-time network data
Lake-wide	Lake-wide nearshore clarity surveys at intervals

Trophic Status - Algae

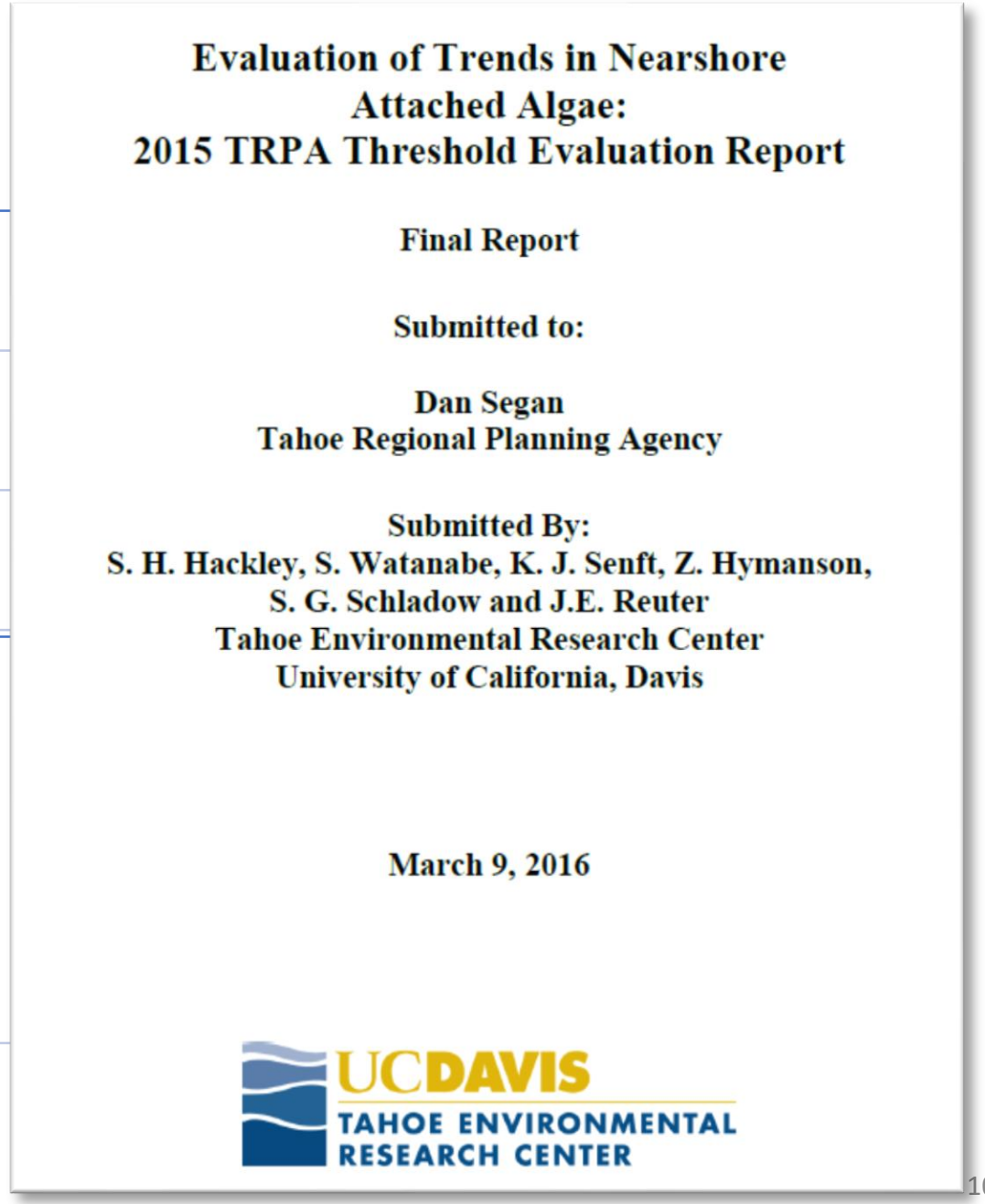
Comprehensive trend analysis (UC-Davis)

Hotspots Pineland targeted research (USGS/UNR)

Periphyton science workshop

Periphyton trend analysis

Routine sites	No Lake-wide trend
	Slight increase at 2 sites
	Slight decrease at 1 site
Synoptic sites	Declining trend



Evaluation of Trends in Nearshore Attached Algae: 2015 TRPA Threshold Evaluation Report

Final Report

Submitted to:

Dan Segan
Tahoe Regional Planning Agency

Submitted By:
S. H. Hackley, S. Watanabe, K. J. Senft, Z. Hymanson, S. G. Schladow and J.E. Reuter
Tahoe Environmental Research Center
University of California, Davis

March 9, 2016

UCDAVIS TAHOE ENVIRONMENTAL RESEARCH CENTER

Target research: Pineland

Goal: Assess the cause of elevated periphyton growth

Approach: Fine-scale water quality monitoring

Findings: Groundwater nutrient inputs are driving growth

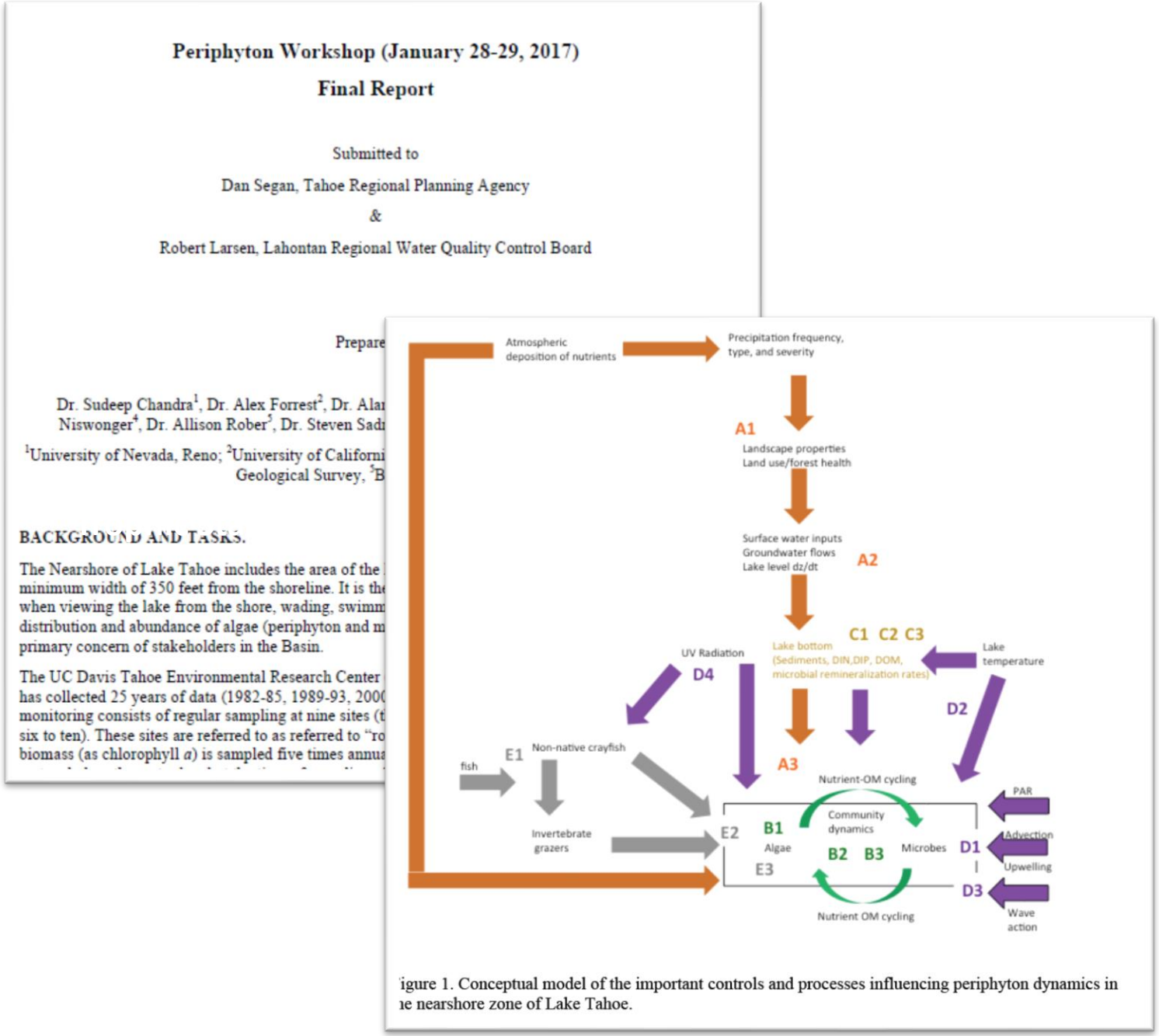
USGS science for a changing world

Nearshore Agency Working Group

Science Workshop

Participants: UC-Davis, USGS, UNR, DRI, Ball State

Outcome:
Identification of 14 possible drivers of change



Periphyton Workshop (January 28-29, 2017)

Final Report

Submitted to

Dan Segan, Tahoe Regional Planning Agency

&

Robert Larsen, Lahontan Regional Water Quality Control Board

Prepare

Dr. Sudeep Chandra[1], Dr. Alex Forrest[2], Dr. Ala
Niswonger[4], Dr. Allison Rober[5], Dr. Steven Sadi

[1]University of Nevada, Reno; [2]University of Californi
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BACKGROUND AND TASKS.

The Nearshore of Lake Tahoe includes the area of the
minimum width of 350 feet from the shoreline. It is th
when viewing the lake from the shore, wading, swimm
distribution and abundance of algae (periphyton and m
primary concern of stakeholders in the Basin.

The UC Davis Tahoe Environmental Research Center
has collected 25 years of data (1982-85, 1989-93, 200
monitoring consists of regular sampling at nine sites (t
six to ten). These sites are referred to as referred to "ro
biomass (as chlorophyll *a*) is sampled five times annua

igure 1. Conceptual model of the important controls and processes influencing periphyton dynamics in
ıe nearshore zone of Lake Tahoe.

Trophic Status – Next Steps

Extend	Extend periphyton sampling season
Expand	Expand periphyton focus to include metaphyton
Explore	Explore alternative monitoring methods

Community Structure - Fish, Invertebrates, Plants

Fish

- Distribution and abundance of native species below historic levels
- Slight increase in native fish abundance from 2009 survey

Invertebrates

- No change in species richness from 2009
- Expansion of non-native clam

Plants

- Non-native plants observed at fewer locations
- Lower lake level implicated
- Marinas not surveyed

Fish, Invertebrates, Plants – Next Steps

Survey	Comprehensive aquatic plant survey (will include marinas)
Establish	Intervals for fish and invertebrate surveys

Human Health – Tahoe Keys Cyanobacteria

Measured toxin levels were low

Human health not threatened

Local vets were informed of domestic pet risk

Cyanotoxin levels dropped as seasonal temperatures changed

Human Health – Next Steps

Revisit	Revisit previously-sampled bacteria sites
Assess	Assess cyano toxin cause and potential

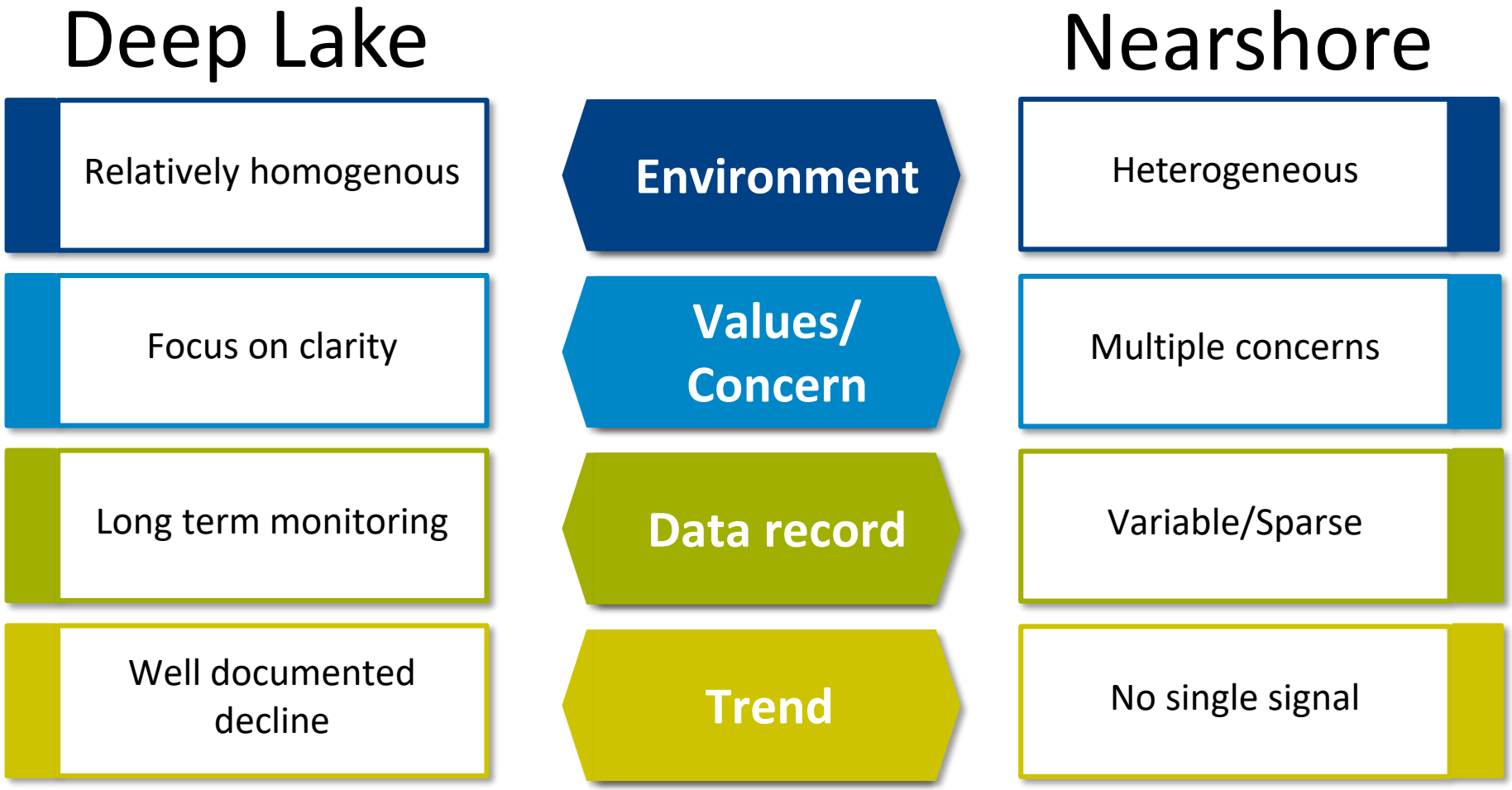
Nearshore Resource Allocation Program

Nearshore Resource Allocation Program

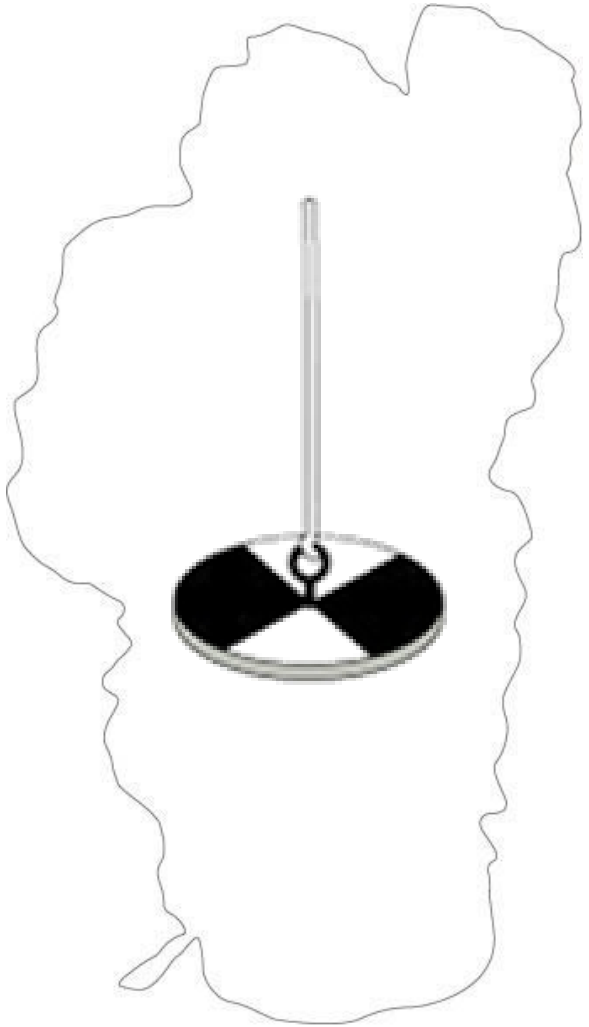
The Need

- Ongoing monitoring resources provide an opportunity
- Allocate constrained resources between many focus areas
- Improve outcomes by bridging the science-management divide

Deep Lake and Nearshore



Deep Lake and Nearshore



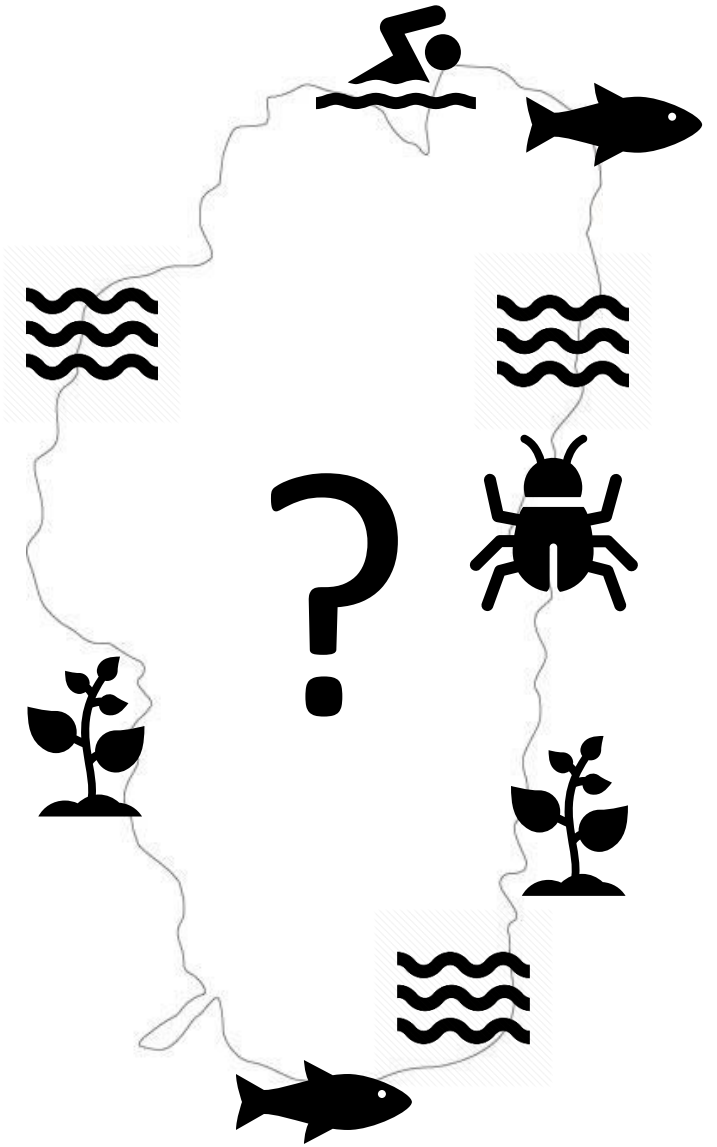
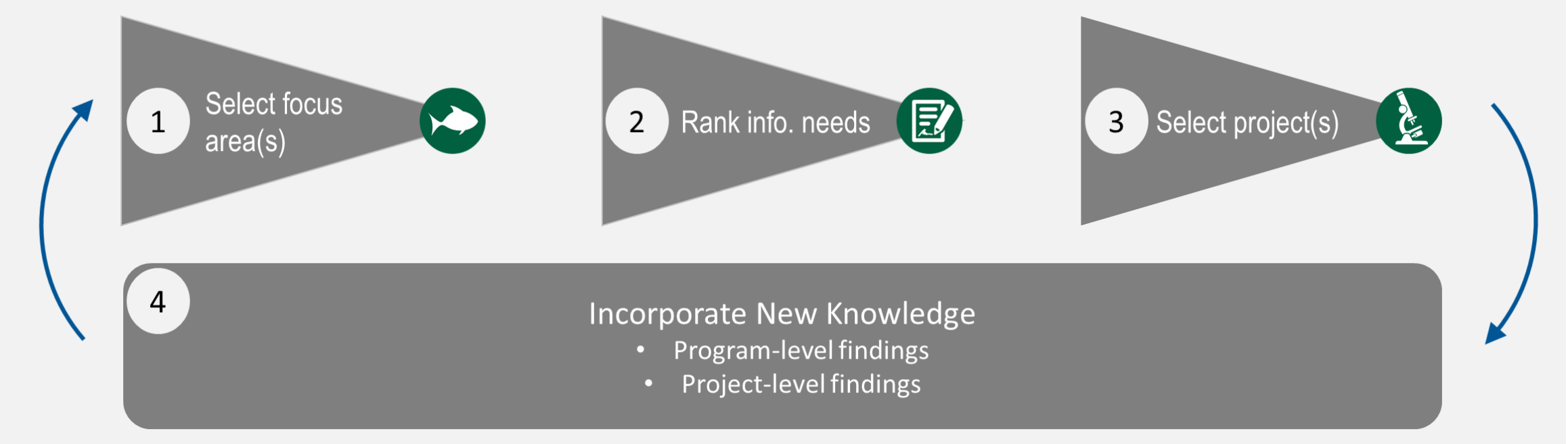


Photo credit: https://www.minneapolisparks.org

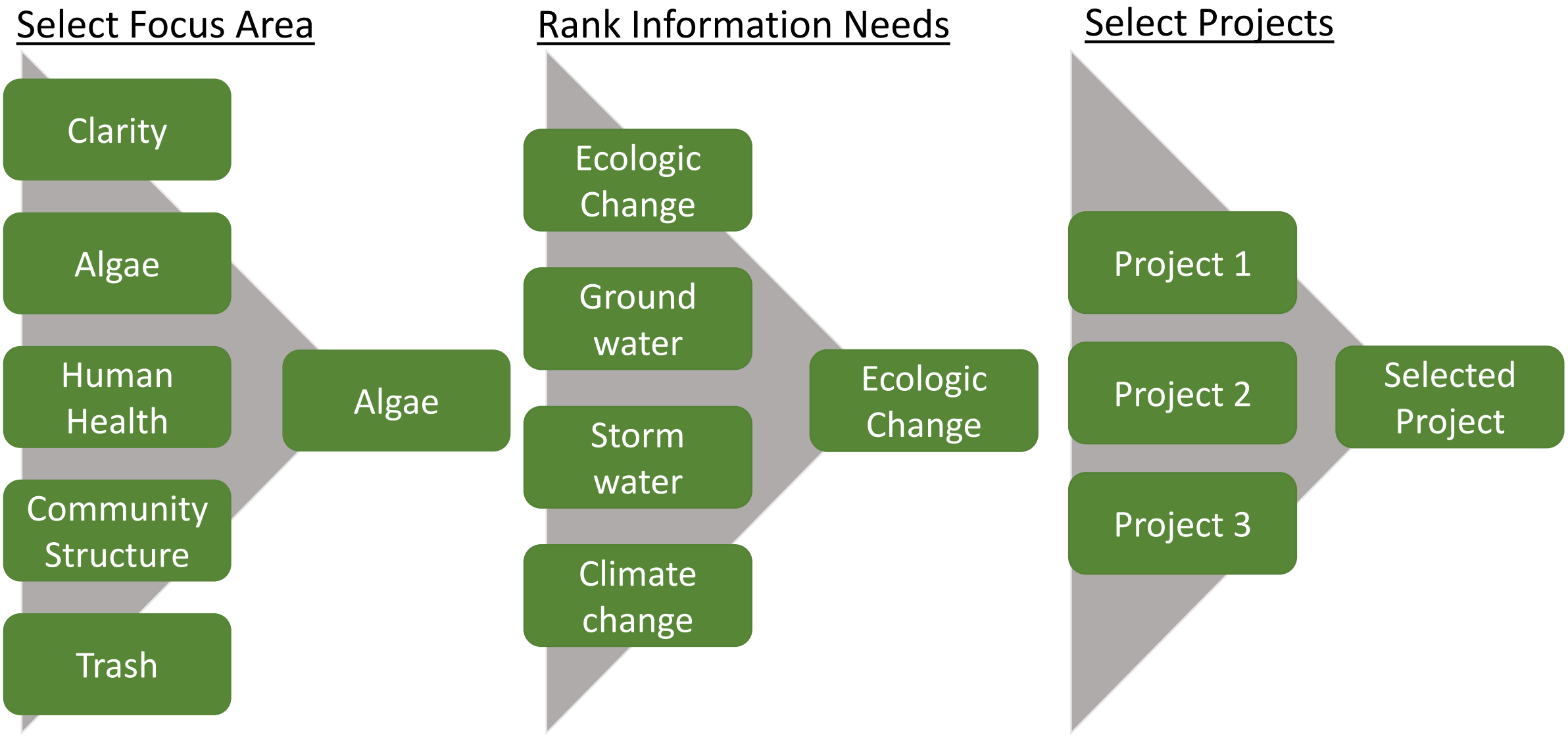
Guiding Philosophy

Investments in monitoring and applied science should be targeted to maximize the expected management utility of the information collected

NRAP Steps


1
Select focus area(s)
2
Rank info. needs
3
Select project(s)
4
Incorporate New Knowledge
• Program-level findings
• Project-level findings

NRAP in Practice



What's next

- 2018 Summer – Aquatic plants survey (AIS)
- 2018 Summer – Microorganisms and toxin survey (human health)
- 2018 Summer – Algae research

- 2018 Winter/Spring – Updated Nearshore Management Plan

Thank You