



# ELKHORN SLOUGH NUTRIENT TMDL SCIENCE: AN OVERVIEW OF PROCESS

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*Stakeholder Advisory Group Meeting  
July 9, 2019*



# ROADMAP

- Background on SCCWRP and my experience
- Overview of “joint fact finding” process
- Key definitions
- Elkhorn Slough TMDL science goals
- Brief overview of key components (will provide greater detail later today)
- Stages and timeline of the project
- Immediate next steps

# ABOUT SOUTHERN CALIFORNIA COASTAL WATER RESEARCH PROJECT (SCCWRP) AUTHORITY



- ▶ Joint Powers Agency founded in 1969
- ▶ Member organizations include city, county, state, and federal agencies
  - 14 member agencies
  - Unique combination of regulators and regulated
- ▶ Today, focus on research and science translation to support improved decisions related to coastal water quality and resource management
  - Coastal watersheds
  - Estuaries and nearshore marine environment

**Key role as independent and objective research organization dedicated to science translation and management application**

# My Background

## As a scientist

- 25 year estuarine eutrophication research
  - 20 years in California estuaries
  - Gulf of Mexico and Florida estuaries
- Estuarine ecologist and nutrient biogeochemist
  - Sediments as sources of internal nutrients
  - Influence of hydrology on eutrophication
  - Estuarine regional monitoring
  - Estuarine indicators and threshold science

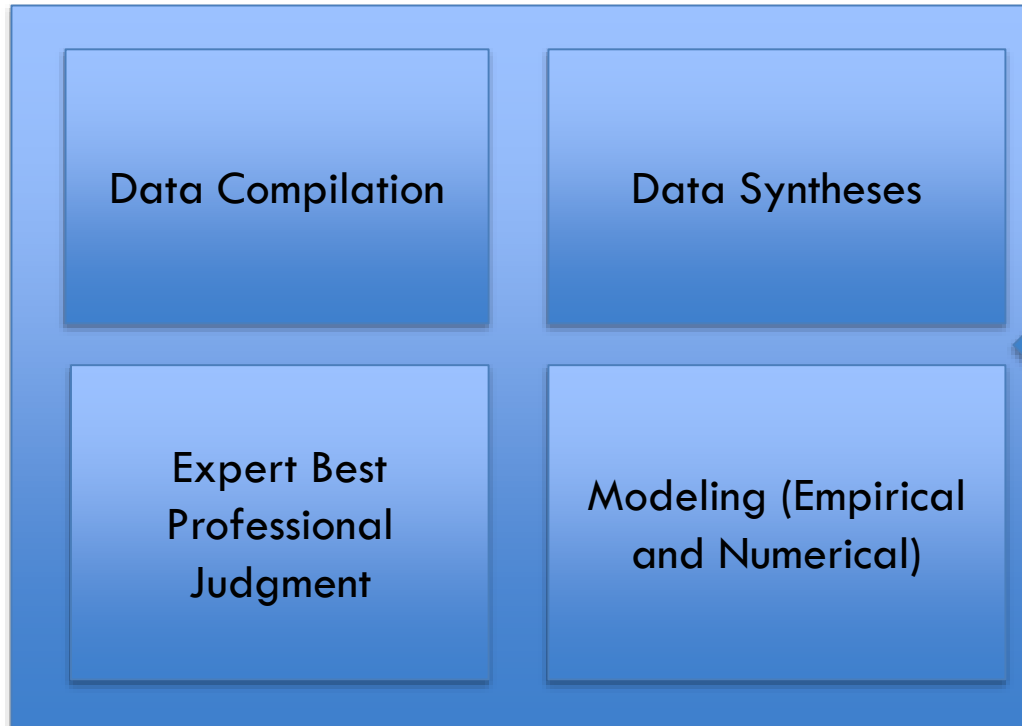
## Science Facilitation and Management Translation

- Technical lead supporting State Water Board program to develop biostimulatory objectives (estuaries, lakes, streams)
- TMDL science facilitation and application of models to support decision-making
  - Malibu Lagoon\*
  - Upper Newport Bay\*
  - Loma Alta Slough
  - Buena Vista Lagoon\*
  - San Elijo Lagoon\*
  - Santa Margarita River estuary

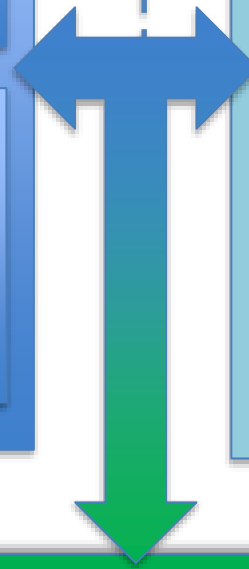
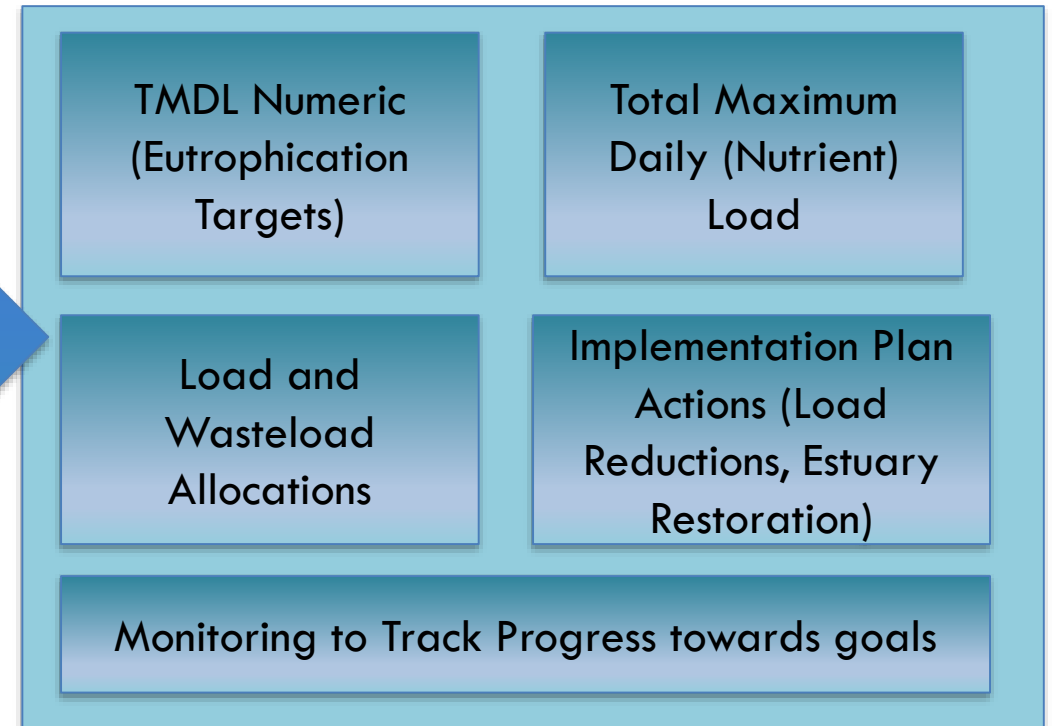
\* Used models to investigate contribution of estuary restoration to alleviate eutrophication problems

# SCIENCE FACILITATION AND “JOINT FACT FINDING”

## Applied Science and Joint Fact Finding



## Policy Decisions and Management Actions



**Desired Environmental Goals and Management Endpoints**

# KEY DEFINITIONS THAT FRAME TMDL SCIENCE

Eutrophication (the Problem): the accelerated delivery, *in situ* production, and/or accumulation of organic matter within an aquatic ecosystem (Nixon 1995, Cloern 2001)



**Biostimulatory Substances and Conditions:** substances such as nutrients (i.e. nitrogen, phosphorus, organic matter) or conditions, such as altered temperature, hydrology, etc. that can cause eutrophication (Cloern 2001, Paerl et al. 2011)

# ROADMAP

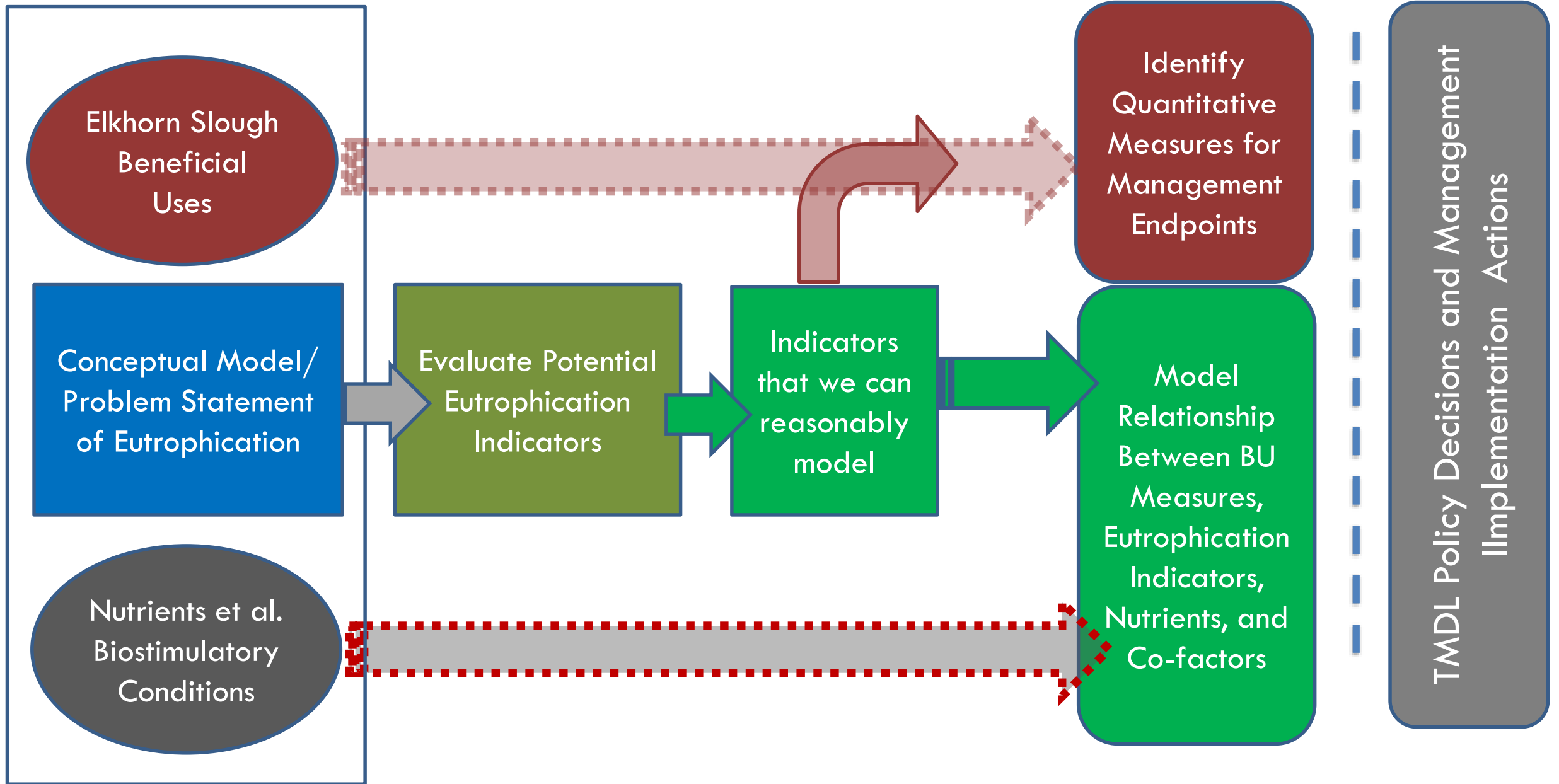
- Background on SCCWRP
- Overview of “joint fact finding” process
- Key definitions for our discussion today

- Elkhorn Slough TMDL science goals
- Brief overview of key components
  - Numerical model development and calibration
  - Synthesis and facilitation of discussion on eutrophication targets
  - Model application to support decision-making
- Stages and timeline of the project
- Immediate next steps

We will provide greater detail in the next agenda item



# BUILDING A SCIENTIFIC FOUNDATION FOR TMDL





# ELKHORN SLOUGH NUTRIENT TMDL SCIENCE GOALS

## **Science**

Synthesize science and use that science to facilitate conversations on eutrophication (biostimulatory) targets protective of Slough beneficial uses

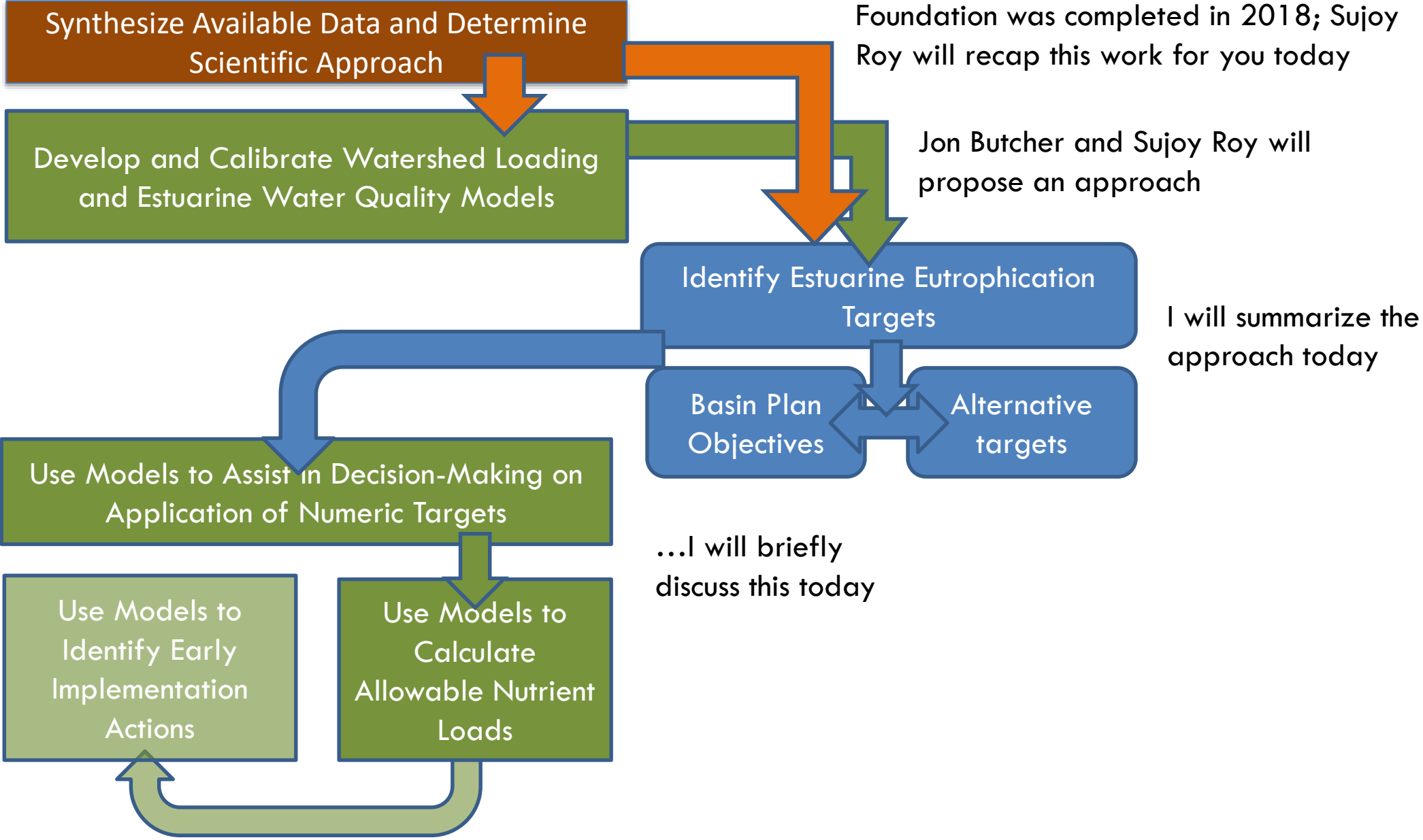
Quantify the relationships between environmental drivers and eutrophication responses in Elkhorn Slough through numerical (computer) modeling

## **Management:**

To quantify the management actions that can result in the remediation of eutrophication in Elkhorn Slough

- Nutrient loads (TMDL)
- Other restoration activities?

# TECHNICAL APPROACH: ELKHORN SLOUGH NUTRIENT TMDL SCIENCE



# STAGES OF PROJECT AND TIMELINE

## 1. Technical Workplan

Aug-Oct 2019

## 2. Conceptual model of eutrophication in Elkhorn Slough and decisions on model selection

Aug-Oct 2019

Management Endpoints

Indicator identification

Synthesis of basis for eutrophication targets

## 3. Model development, calibration, and sensitivity analyses

Aug 2019 – Oct 2020

Hone in focal eutrophication indicators that can serve as the basis for numeric targets (dependent on model performance)

## 4. Application of models and data syntheses to support decision making

Oct 2020– April 2021

# PRODUCTS

## 1. Technical workplan

October 2019

## 2. Model development and calibration report

October 2020

## 3. Model application report

- Conceptual model of “problem” of eutrophication and Linkage to key indicators
- Application of model to derive eutrophication numeric targets
- Application of model to derive TMDL
- Derivation of model to derive load and waste load allocations

Oct 2020 – April 2021

# IMMEDIATE NEXT STEPS

1. Reinvigorate SAG membership
2. Decide on whether you want a technical advisory committee (as subcommittee of SAG)
3. Begin providing input on technical workplan
  - First opportunity is today (you will hear general overview)
  - Next meeting will focus on detailed written workplan

Questions? Comments?

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