Nutrients in the Bay:
Strategy Development and Implementation

- Context for nutrient management

- Nutrient strategy and priority projects

- Proposed work for 2012

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Context for Nutrient Management in the Bay/Delta

- The Bay is widely recognized as a nutrient-enriched estuary

- Historic resilience to nutrient-enrichment…weakening?
  - ↑ algal biomass ↓O_2 in all Bay segments
  - hypothesized linkages between NH_4^+ and ↓ productivity in North Bay

- Uncertain future for USGS research program…local funding?
  - RMP-funding since 1993…($110k/yr)

- State Water Board developing nutrient objectives for estuaries, a.k.a Nutrient Numeric Endpoint (NNE)
  - SFRWQCB has begun NNE process for San Francisco Bay

Moving Toward a Nutrient Strategy: Recent Work

- Literature review and data gaps analysis (McKee et al., 2011)
  - Proposed recommended NNE indicators
  - Synthesized literature on status of “eutrophication”
  - Identified data gaps and next steps

- June 2011 BACWA Nutrient Management Workshop
  - Identified need for a nutrient strategy
  - Preliminary consensus on priority work elements

- Early draft of nutrient strategy reviewed by RMP workgroup
  - Preliminary consensus on management questions & work elements
  - Recommended RMP-fundable projects for 2012

Near-Term Nutrient Management Decisions (Draft Strategy)

Is there a problem, and how is it defined?

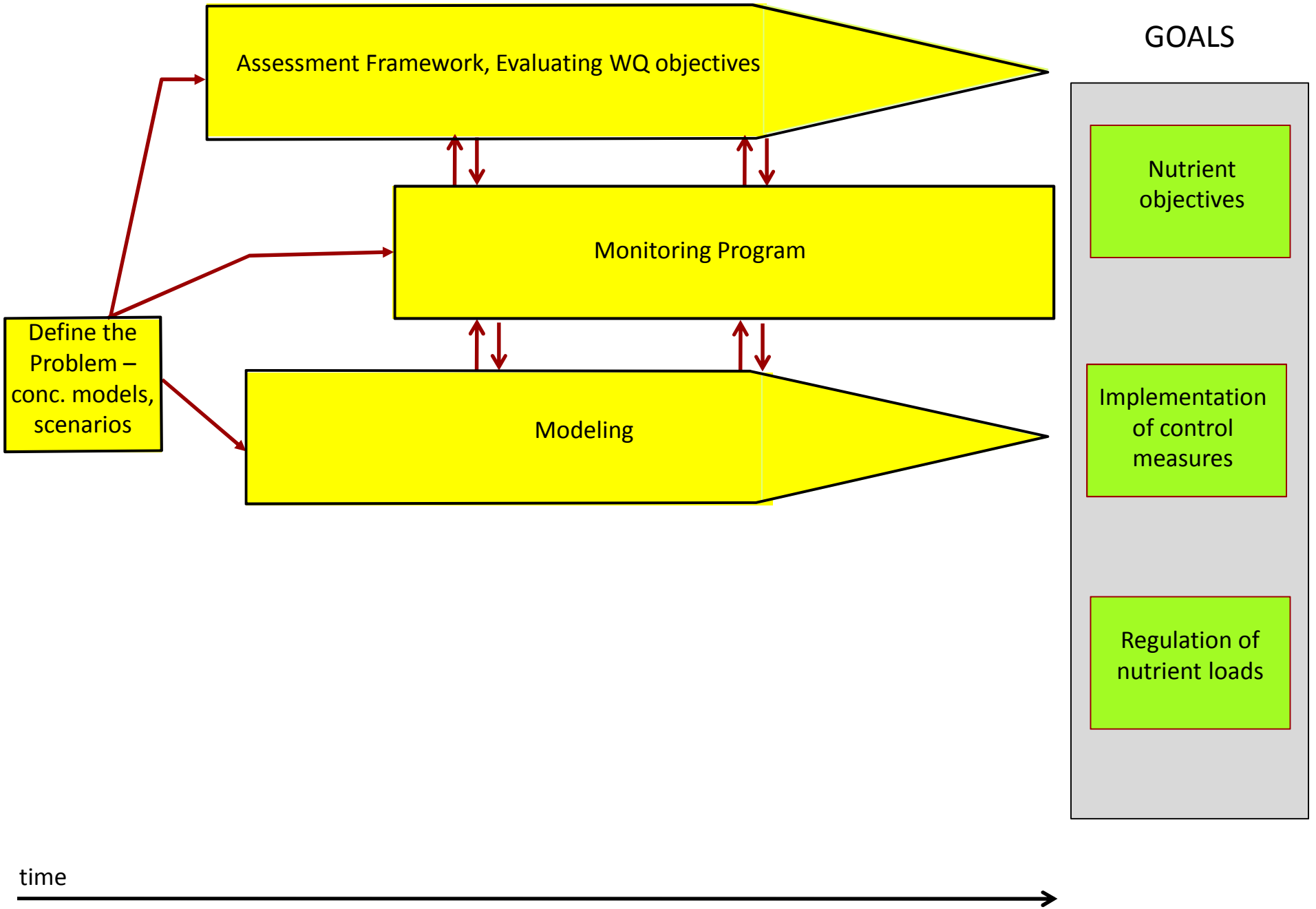
Which sources, pathways, and processes are most important?

What nutrient loads can be assimilated without impairment of beneficial uses?

What is the likelihood that the Bay will be impaired by nutrient overenrichment/eutrophication in the future?

What are appropriate guidelines for identifying a nutrient-related problem?

SF Estuary Nutrient Strategy



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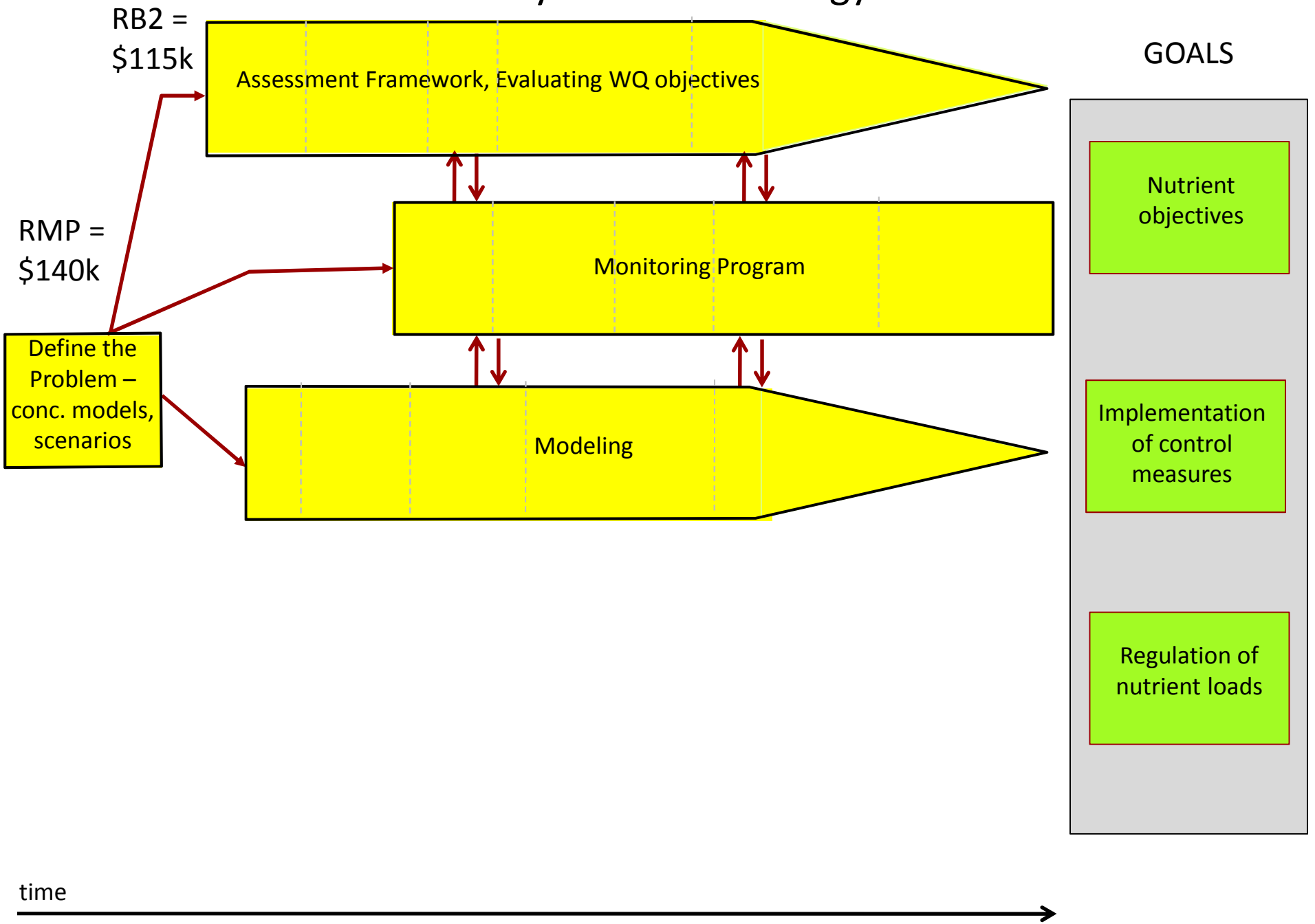
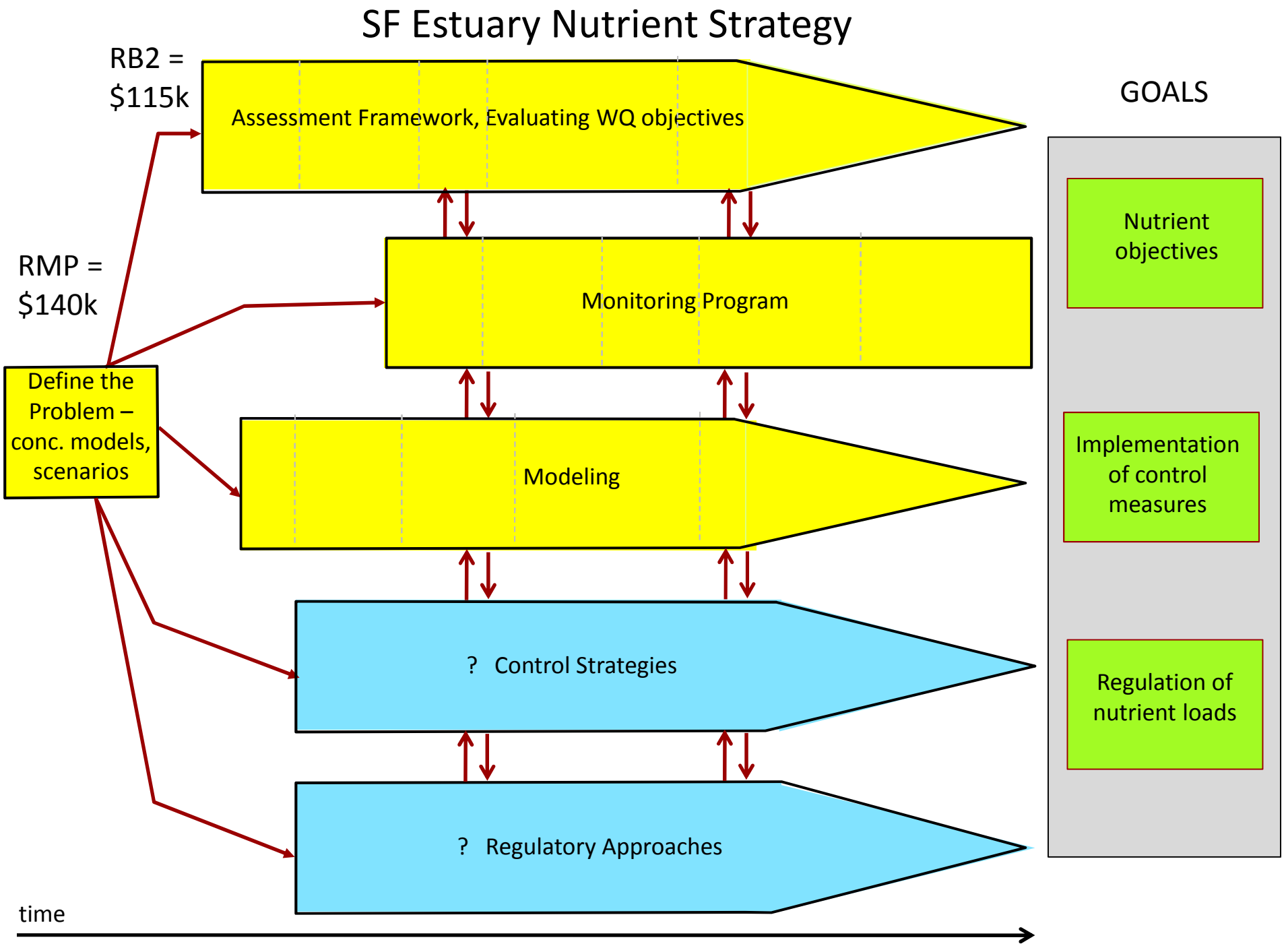



SF Estuary Nutrient Strategy
RB2 = $115k
RMP = $140k
Define the Problem – conc. models, scenarios
Assessment Framework, Evaluating WQ objectives
Monitoring Program
Modeling
? Control Strategies
? Regulatory Approaches
time
GOALS
Nutrient objectives
Implementation of control measures
Regulation of nutrient loads

Proposed Plan for 2012

1) Commence work on funded projects (RMP, RB2)

2) Developing (iterating) and implementing the nutrient strategy
   - Coordination
   - Communication

3) Launch proposed box-model/budget study

#1: Funded Projects – 2012

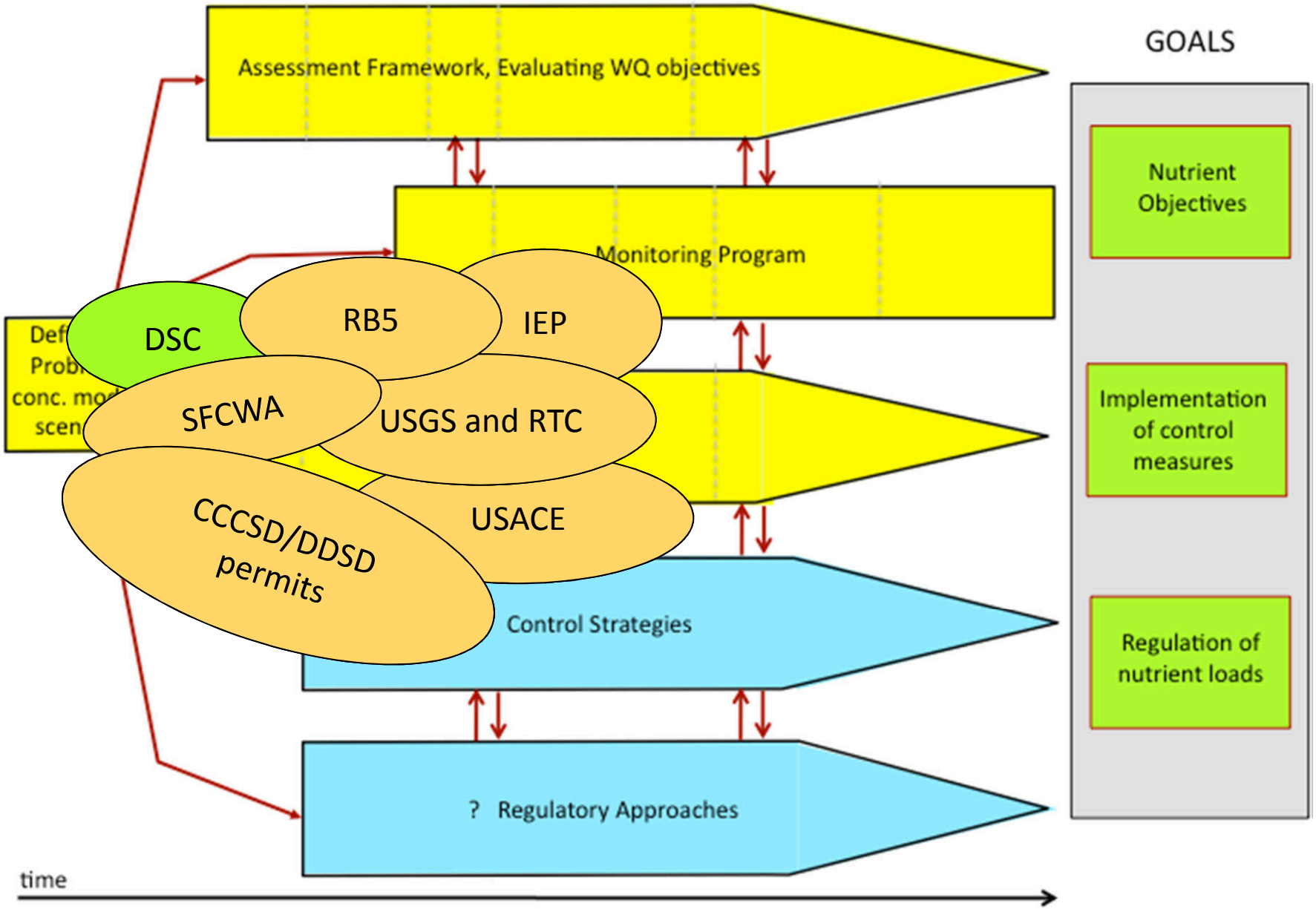
RMP-funded Projects

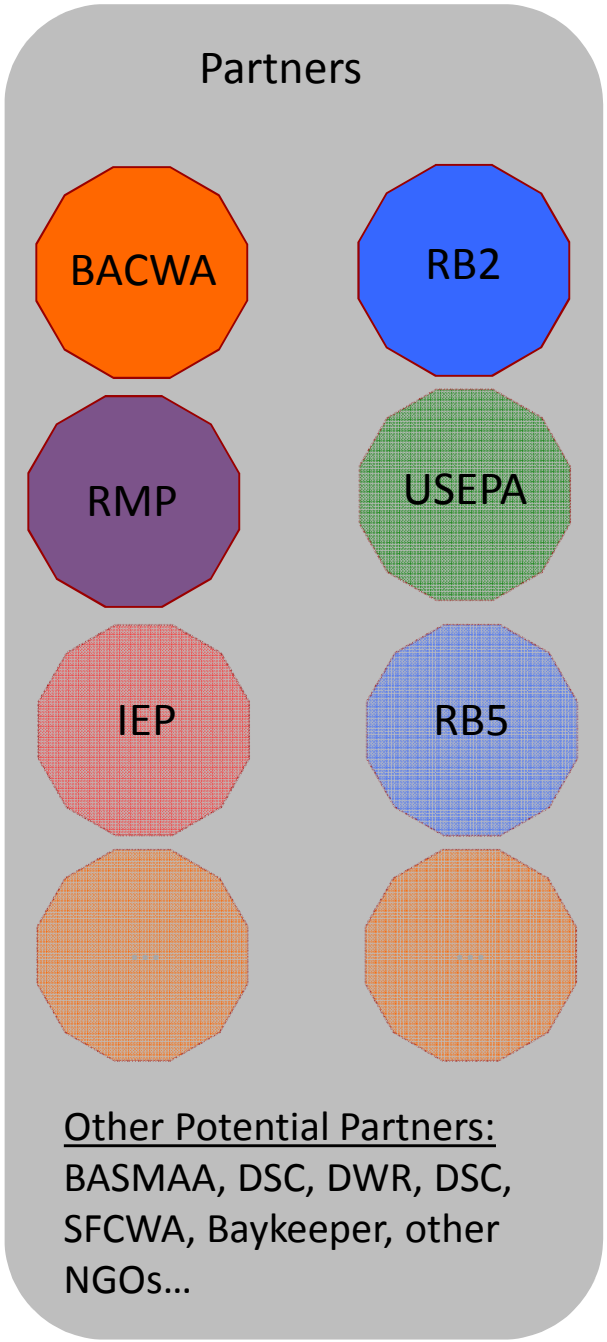
A. Conceptual Model and Scenario Building	$80k
B. External Nutrient Loads and Data Gaps Analysis	$20k (*$30k 2013)*
C. Management of Nutrient Strategy Development	$10k
D. Stormwater nutrient loads (4 watersheds)	$30k

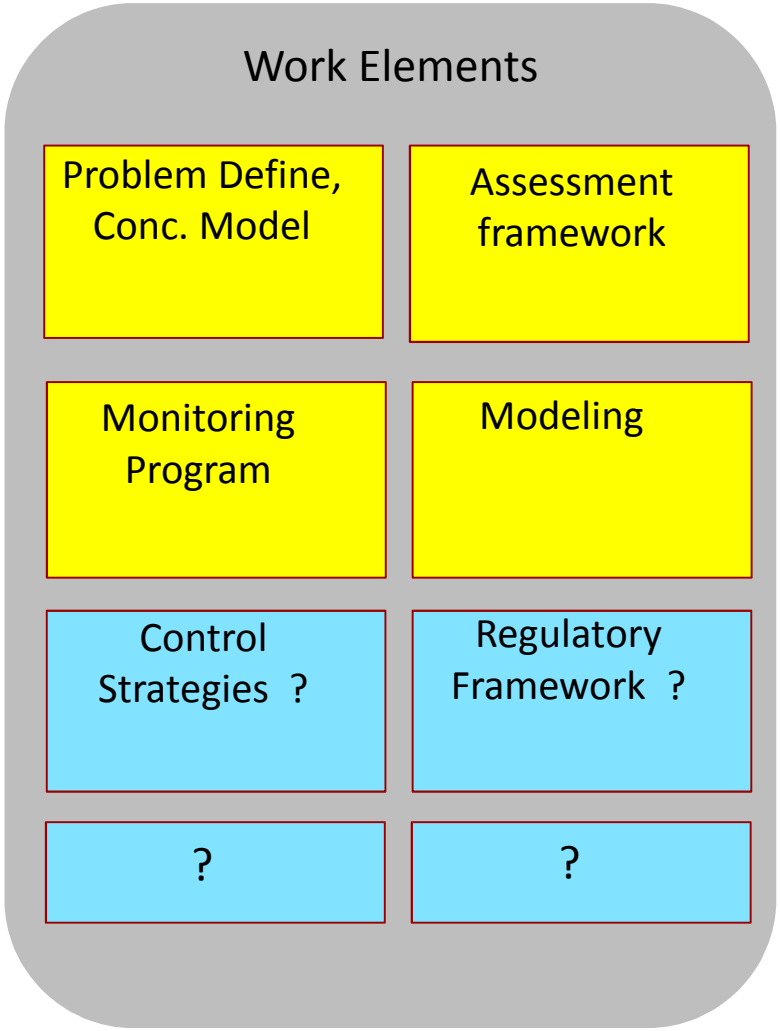
RB2-funded Project

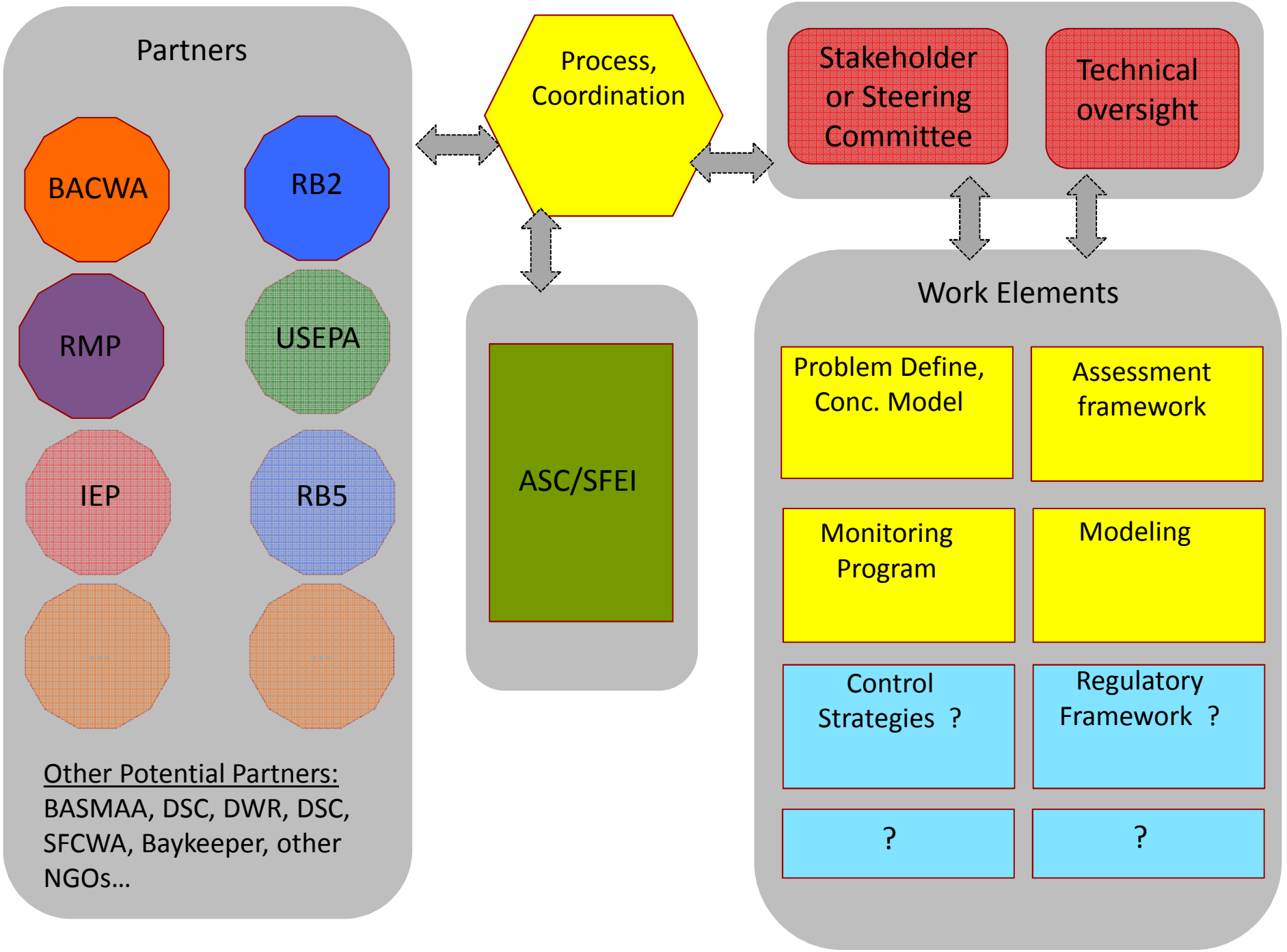
Phytoplankton assessment framework - e.g., abundance, phytoplankton assemblage, HABs - approaches for classifying Bay segments	$60k *($55k in 2013)*

#2: Nutrient strategy development: coordination, communication, iteration




Partners
BACWA
RB2
RMP
USEPA
IEP
RB5
...
...
Other Potential Partners:
BASMAA, DSC, DWR, DSC, SFCWA, Baykeeper, other NGOs…


Work Elements
Problem Define, Conc. Model
Assessment framework
Monitoring Program
Modeling
Control Strategies ?
Regulatory Framework ?
?
?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Process, Coordination
ASC/SFEI
Stakeholder or Steering Committee
Technical oversight
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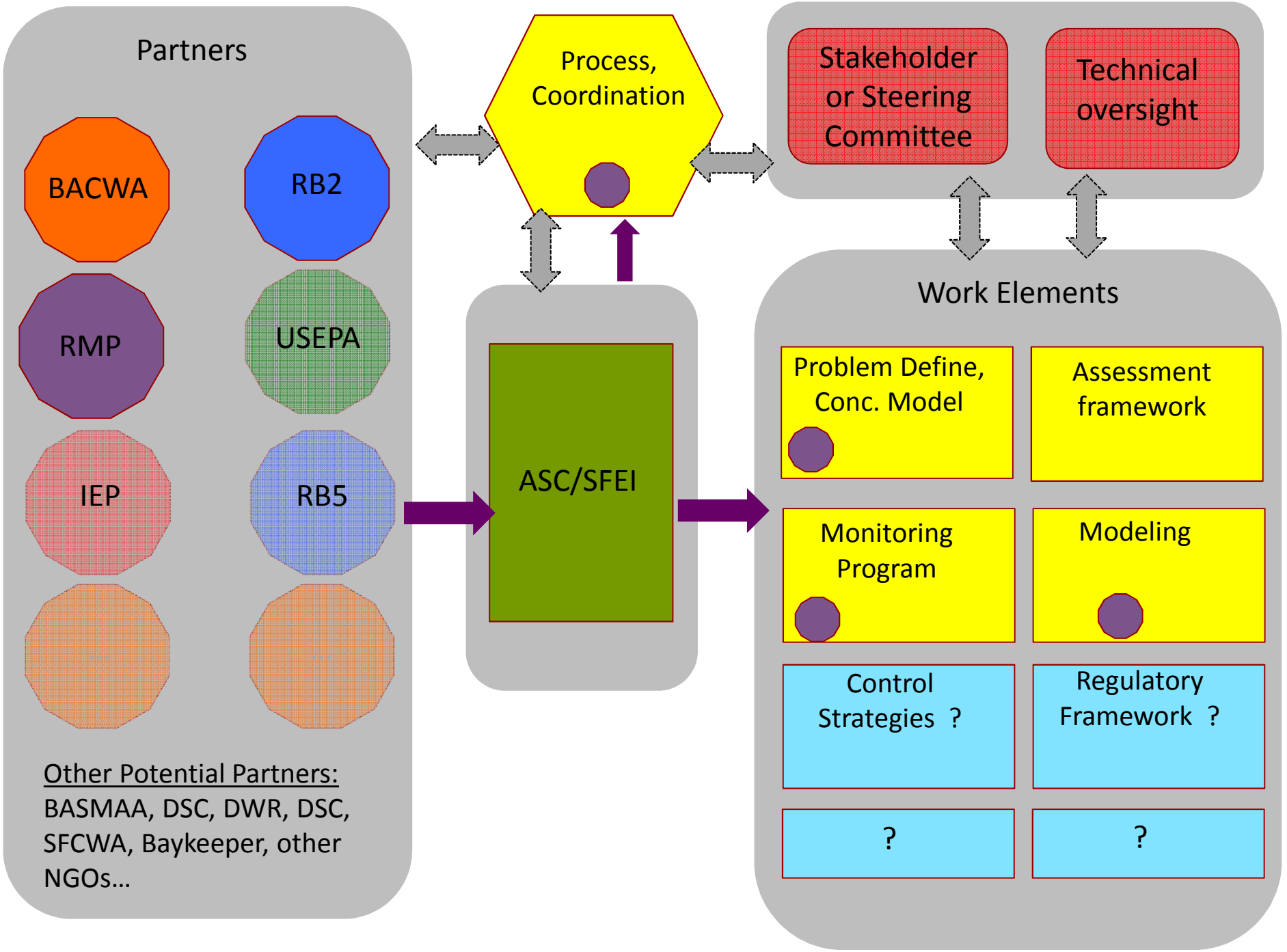
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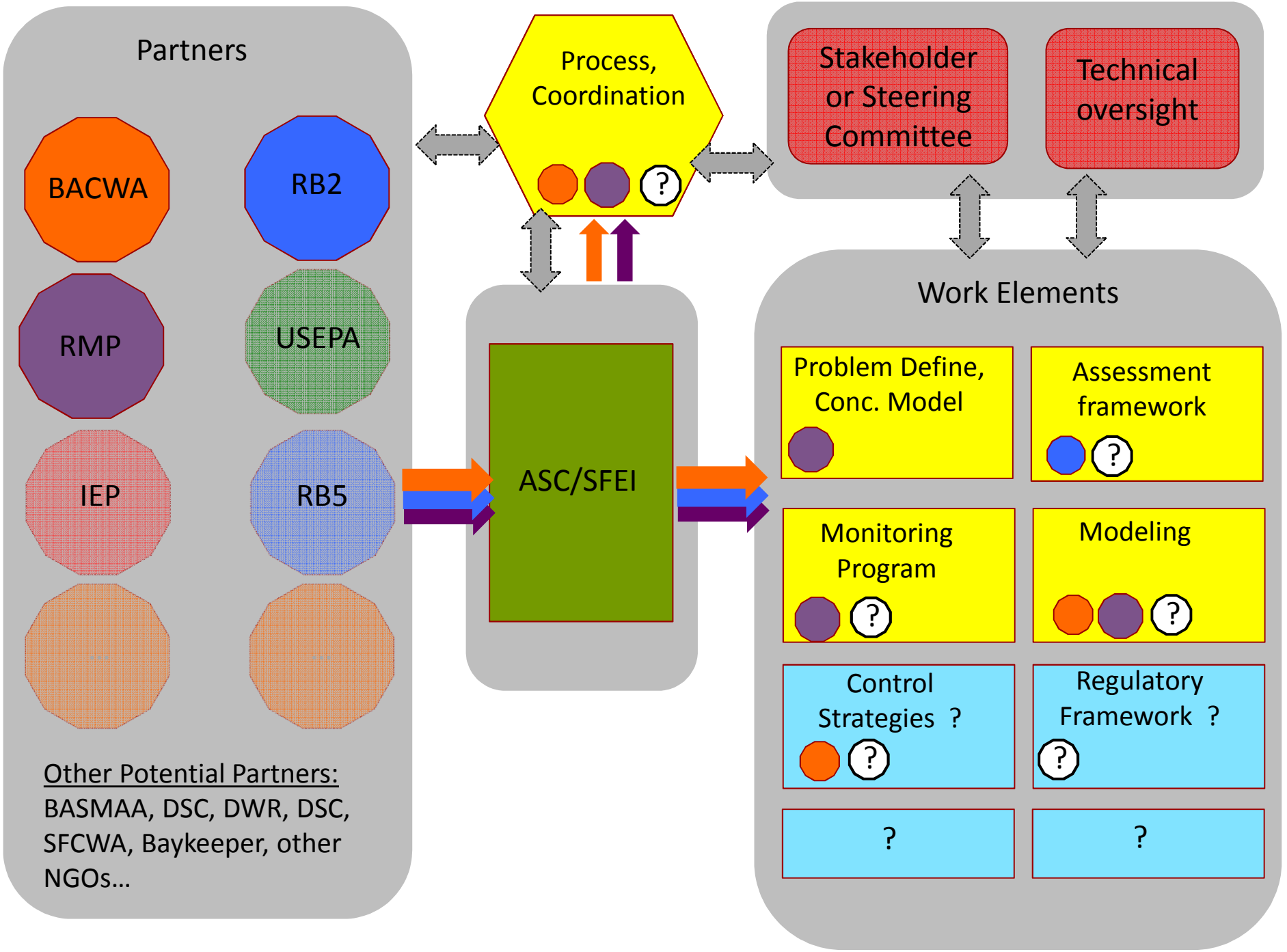
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?

#2: Nutrient strategy development: Coordination, communication *($ = BACWA-RB2 ? , RMP)*

Activities:

- Quarterly stakeholders meetings, sub-committee work, technical teams

- Develop science strategies jointly with other groups (e.g., IEP, DSC, SFCWA)

- Attend workgroups/committees around Estuary

- Communicate with stakeholders – website, listserv

- Iterate Nutrient Strategy, develop organizational structure

Work products:

- Revised Nutrient Strategy, organizational structure
  - quarterly updates, 'final' version November 2012
- Website: clearinghouse, calendar, links, listserv updates

RMP Next Steps on Nutrients

- Begin work on 2012 projects

- Remain key partner in Strategy development/implementation
    - identifying, scoping, and funding work elements
    - helping to recruit other partners
    - input on organizational structure/process

- Likely priority areas for RMP funding in 2013 and beyond…
    - monitoring program
    - modeling strategy…coordinate with contaminant fate workgroup

Modeling

- Hydrodynamic and WQ/pollutant-fate model is an on-going RMP priority
  - PCBs, Hg, etc.
  - nutrients…timing priority?
- Multiple modeling platforms (e.g., TRMM, Delft3D, EFDC, SUNTANS)
  - no consensus among regional scientists
- RMP should
  - play a leading role in defining the modeling needs for the Bay
  - move the modeling/management community toward a 'consensus' platform
- Goal: Develop a modeling strategy to support multiple contaminants
  - guided by and broad buy-in among researchers/regulators/managers
  - decade-long shelf-life
- Next steps:
  - joint effort: nutrients + PCBs/Hg/etc.
  - Modeling Symposium – second half of 2012

Task 3: Box Models and Budgets, Suisun Bay and South Bay: Hypothesis testing and sensitivity analysis

Rationale:

- Critical step between conceptual model and more sophisticated models
- 'Simple' hypothesis-testing quantitative tool is a critical need
    - Relative importance of key processes and future changes
- Sensitivity analysis, data gaps, identifying new science needs.
- Build on existing models, work closely with key regional scientists

Work products:

- 2 yr project…1 FTE – SFEI/USGS/RTC
- Hypothesis testing, sensitivity analysis, future study recommendations
- Draft and final reports (0.5 yr update, 1 yr Suisun; 1.5 yr update, 2 yr South)
- Start…July 2012 (0.5 FTE in 2012)

Proposed Budget

Strategy Development: coordination, communication	$200k
- 50% D Senn effort	
- 30% SFEI staff	
- Website setup and maintenance	
Nutrient/WQ box models	$75k
- July 2012 start (0.5 FTE in 2012)	
Total 2012 Budget Request	$275k

Other possible costs:

Joint Nutrient Workshop with SFCWA	$??
Joint Modeling Workshop with RMP	$??