

# **OCEAN ACIDIFICATION AND HYPOXIA PANEL REPORT**

**Presentation to the SCCWRP Commission**

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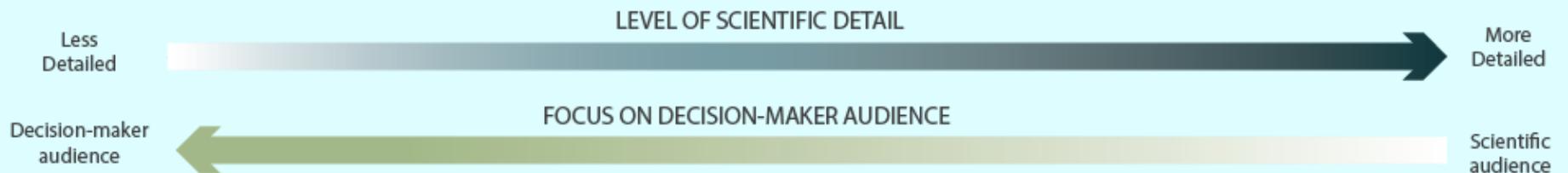
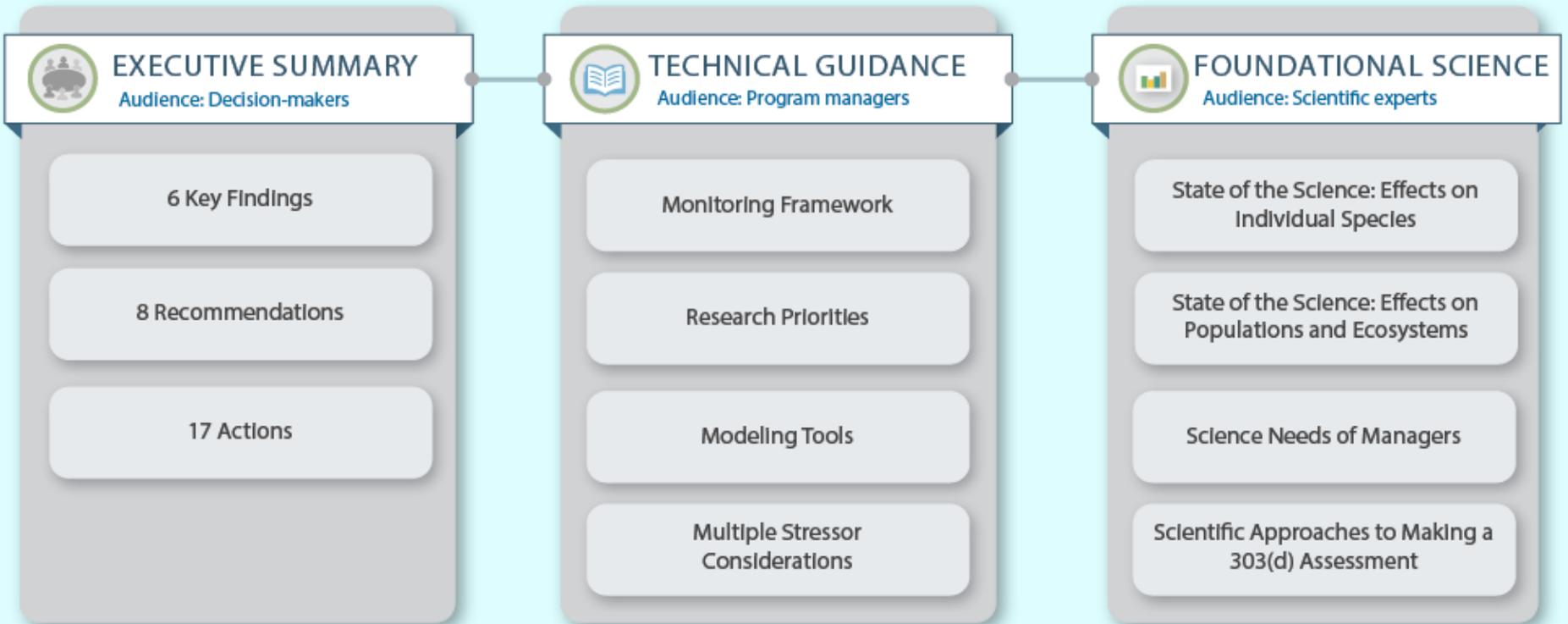
**March 4, 2016**

# OCEAN ACIDIFICATION AND HYPOXIA PANEL

- **Acidification has gained considerable management attention**
  - Focal point for the West Coast Governor's Alliance on Ocean Health
  - One of two foci for the Pacific Coast Collaborative
- **Expert Panel formed to summarize the state of the science and identify management options**
  - 20 top scientists in the field have been working for two years
  - The Panel has developed nine documents that describe and support a series of findings and recommendations
- **You asked for a briefing on those reports**
  - Timing is a little awkward as the reports have not yet been released
  - But, I can still provide you the high points

# The West Coast Ocean Acidification and Hypoxia Science Panel

## PRODUCT OVERVIEW



# EXECUTIVE SUMMARY

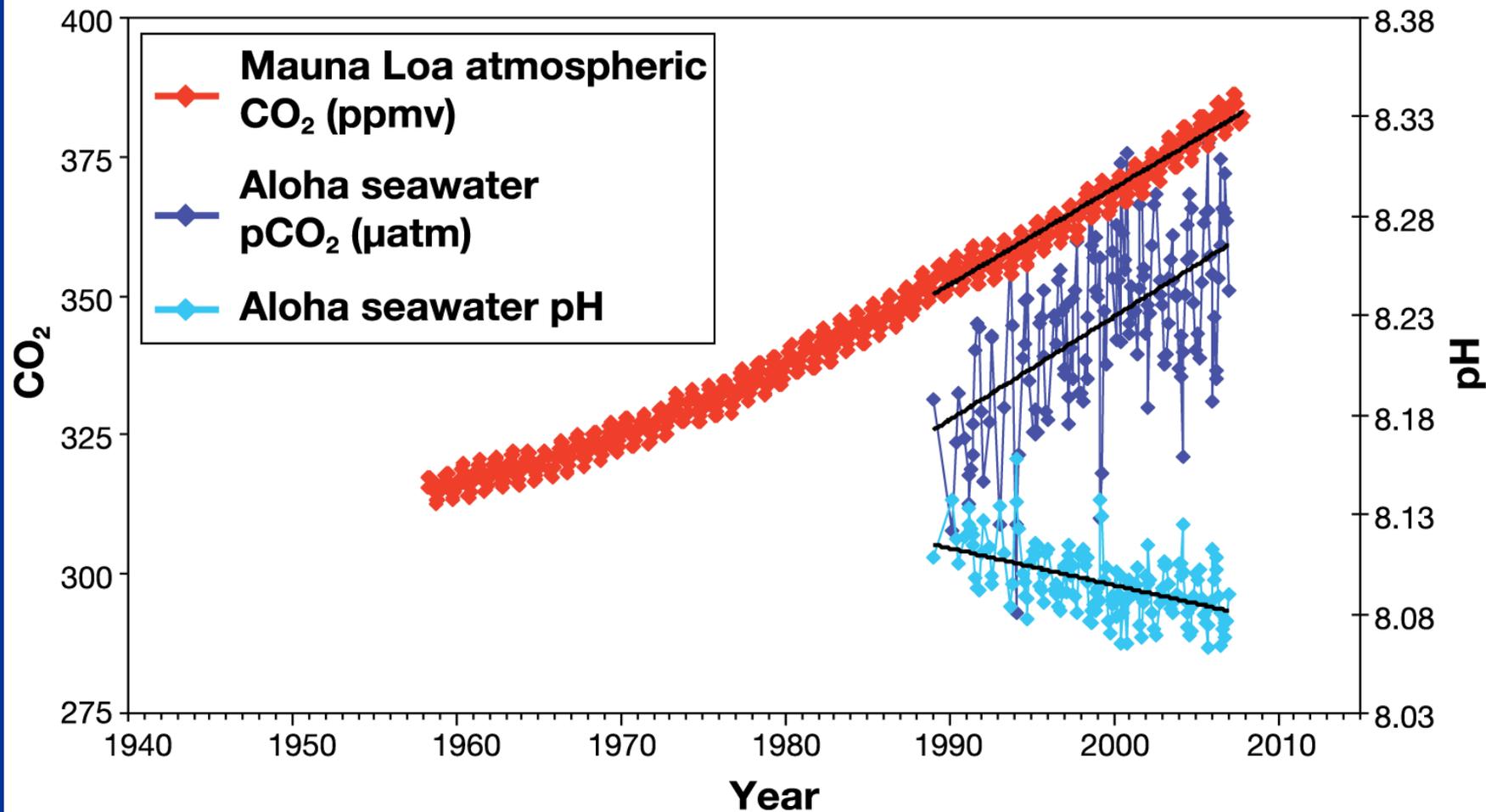
- **Six findings**
  - Summarizing our State of Knowledge
- **Eight recommendations**
  - What should you do about it?
- **Seventeen action items**
  - Translating the recommendations into things you can do now
- **Supported by eleven appendices**
  - Two-page tear-out fact sheets

# FINDINGS

- **OAH will have severe ecological and economic consequences for the West Coast**
- **Global carbon emissions are the root cause of OAH**
- **There are actions you can take to lessen exposure to OAH**
- **You can also enhance the ability of ecosystems to cope with OAH**
- **Accelerating OAH science will expand the number of management options available**
- **Inaction now will reduce options and impose higher costs later**

# WATER QUALITY TRENDS ARE APPARENT

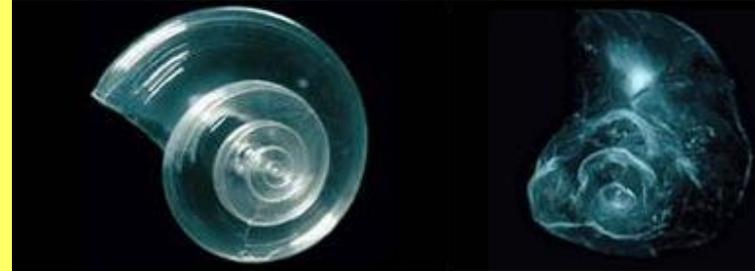
## CO<sub>2</sub> Time Series in the North Pacific Ocean



# BIOLOGICAL EFFECTS ARE STARTING

- **Shell-forming abilities are the first to be affected**
  - Larval forms most vulnerable
- **We are also seeing early effects on fish behavior**
- **Most apparent change is in the oyster industry**
  - Four hatcheries provide >90% of seed stock and three have suffered acidification-related failures
  - They now need to buffer their water for the larvae to grow

Pteropod



Urchin



Sea star



Healthy Organisms

Organisms under acidified conditions

# FINDINGS

- **OAH will have severe ecological and economic consequences for the West Coast**
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# Roadmap of Local Management Options to Address Acidification and Hypoxia

**REDUCE EXPOSURE**

**ENHANCE ABILITY OF BIOTA TO COPE**

**Reduce nutrient and carbon inputs**

**Advance carbon removal strategies**

**Reduce other stressors**

**Advance adaptive capacity**

**RESEARCH**

**MONITORING**

# ACTION ITEMS MOST RELEVANT TO SCCWRP MEMBER AGENCIES

- **Build models to evaluate where/when/if control of nutrient inputs makes sense**
  - The models will also address carbon removal strategies
  - SCCWRP is active in implementing this
  - Member agencies are also active participants in that modeling effort
- **Develop new acidification criteria**
  - pH is not the most relevant measure
  - The existing pH thresholds are not scientifically well-founded
  - The CA Assembly is out in front on this one with introduction of Assembly Bill 2139 (Williams) two weeks ago
- **Enhance monitoring efforts**
  - May affect what and how you make measurements
  - You are already leaders in the field with your evaluation of new pH sensors and deployment of continuous water quality moorings

# TIMING

- **Panel delivered the final reports yesterday**
  - Those will be placed into a formatted document today
- **The PCC will create an embargoed draft to brief the management and stakeholder community**
  - Please ask Commissioner Phillips if you would like a more detailed briefing
- **Planned public release of the documents is April 4**