

## Indicator subgroup meetings

### List of subgroup members

#### Technical Workgroup Members:

Cheryl Brown (U.S. Environmental Protection Agency, Office of Research and Development; EPA ORD), Steve Weisberg (Southern California Coastal Water Research Project, SCCWRP), Martha Sutula (SCCWRP), Richard Feely (National Oceanic and Atmospheric Administration), Jan Newton (University of Washington/Northwest Association of Networked Ocean Observing Systems), Jack Barth (Oregon State University), Christina Frieder (SCCWRP), Steve Rumrill (Oregon Department of Fish and Wildlife), Nina Bednarsek (OSU), Jim Barry, Stephen Pacella (EPA ORD), Jan Newton (University of Washington/NANOOS), Francis Chan (OSU), Simone Alin (NOAA)

#### Agency Representation:

Jill Fullagar (EPA, Region 10), Michelle Robbins (CA State Water Resources Control Board; SWRCB), Michelle Maier (EPA), Justine Kimball (California Ocean Protection Council; OPC), Megan Williams (OPC), Keara Tusso (SWRCB), Rochelle Labiosa (EPA, Region 10)

#### DEQ Standards and Assessment Program Staff:

Connie Dou, Lesley Merrick, Kaley Major

#### Subgroup Facilitator:

Kaegan Scully-Engelmeyer (DEQ)

### Subgroup Scope:

Develop recommendations to DEQ for chemical and biological OA data impairment thresholds and approach to reference condition characterization

### Meetings:

Subgroup Meeting #1: August 2, 2022

Subgroup Meeting #2: August 10, 2022

Subgroup Meeting #3: October 7, 2022



State of Oregon  
Department of  
Environmental  
Quality

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**Indicator Subgroup Meeting #1 – Biological OA Data**  
**August 2, 2022, 9 a.m. – 11 a.m. PT**

In attendance: Richard Feely, Steve Weisberg, Cheryl Brown, Martha Sutula, Steven Rumrill, Nina Bednarsek, Michelle Robbins, Michelle Maier, Justine Kimball, Megan Williams, Connie Dou, Lesley Merrick, Jill Fullagar, Kaegan Scully-Engelmeyer, Kaley Major, Christina Frieder

**Meeting outcomes:**

- Discuss near term and long term biological indicators
- Discuss reference conditions and threshold development for severe shell dissolution

**Agenda:**

<b>Time</b>	<b>Topic</b>
9:00 a.m.	<b>Welcome and introduction</b> <ul style="list-style-type: none"> <li>• Agenda overview</li> <li>• Meeting format and goals</li> </ul>
9:05 a.m.	<b>Indicator Discussion</b> <ul style="list-style-type: none"> <li>• Brief recap of hybrid approach</li> <li>• Near term vs. long term candidate indicators</li> </ul>
9:30 a.m.	<b>Discussion</b> - strawdog biological OA data answers <ul style="list-style-type: none"> <li>• Endpoint (severe dissolution) and taxa (pteropods, crabs, others) considerations</li> <li>• Defining an exceedance threshold relative to reference               <ul style="list-style-type: none"> <li>○ Spatial vs. temporal basis for reference</li> <li>○ anthropogenic and seasonal considerations</li> </ul> </li> </ul>
10:45 a.m.	<b>Next steps</b> <ul style="list-style-type: none"> <li>• Next steps in exceedance threshold determination</li> <li>• Collection and processing methodology standardization</li> </ul>
11:00 a.m.	<b>Adjourn</b>

**Indicator Subgroup Meeting #2 – Chemical OA Data**  
**August 10, 2022, 1:00 p.m. – 3:00 p.m. PT**

In attendance: Richard Feely, Steve Weisberg, Jan Newton, Cheryl Brown, Martha Sutula, Connie Dou, Lesley Merrick, Jill Fullagar, Kaegan Scully-Engelmeyer, Kaley Major, Christina Frieder, Francis Chan, Simone Alin, Jim Barry, Jack Barth, Rochelle Labiosa, Megan Williams

**Meeting outcomes:**

- Discuss near term vs. long term chemical indicators/metrics
- Discuss chemical impairment threshold development, biological endpoint and taxa considerations, and data integration methods

**Agenda:**

<b>Time</b>	<b>Topic</b>
1:00 p.m.	<b>Welcome and introduction</b> <ul style="list-style-type: none"> <li>• Agenda overview</li> <li>• Meeting format and goals</li> </ul>
1:05 p.m.	<b>Metric Discussion</b> <ul style="list-style-type: none"> <li>• Brief recap of hybrid assessment approach</li> <li>• Near term vs. long term chemical indicators/metrics</li> </ul>
1:20 p.m.	<b>Endpoint and Threshold Discussion</b> - strawdog chemical OA data answers <ul style="list-style-type: none"> <li>• Approach to chemical threshold development based on OA stress/biological relationships <ul style="list-style-type: none"> <li>○ Biological endpoint and taxa considerations</li> <li>○ Chemical data integration methods</li> </ul> </li> <li>• Defining expected threshold exceedance relative to background (if time allows) <ul style="list-style-type: none"> <li>○ Nearshore reference adjustment factor</li> </ul> </li> </ul>
2:45 p.m.	<b>Next steps</b> <ul style="list-style-type: none"> <li>• Defining critical spatial and temporal windows of likely biological impact</li> <li>• Sampling distribution, frequency, and quality assurance</li> </ul>
3:00 p.m.	<b>Adjourn</b>

**Subgroup Meeting #3**  
**October 7, 2022, 9:00 a.m. – 12:00 p.m. PT**

In attendance: Richard Feely, Simone Alin, Steve Weisberg, Cheryl Brown, Martha Sutula, Connie Dou, Lesley Merrick, Jill Fullagar, Kaegan Scully-Engelmeyer, Christina Frieder, Michelle Robbins, Kaley Major, Keara Tusso, Jennifer Fisher (OSU), Debra Sturdevant, Megan Williams, Steven Rumrill, Justine Kimball, Stephen Pacella, Rochelle Labiosa, Francis Chan, Travis Pritchard, Jan Newton, Jack Barth, Nina Bednarsek

**Meeting outcomes:**

- Overview aragonite impairment threshold, nearshore (inner shelf) reference conditions, and areas of uncertainty
- Overview pteropod metric/threshold, collection/processing standardization, and areas of uncertainty
- Discuss additional indicator presentation– based on biological vulnerability to seasonal shifts in OA parameters

**Agenda:**

<b>Time</b>	<b>Topic</b>
9:00 a.m.	<b>Welcome &amp; introduction</b> – Kaegan Scully-Engelmeyer (DEQ) <ul style="list-style-type: none"> <li>• Workgroup/subgroup updates</li> <li>• Agenda overview</li> </ul>
9:10 a.m.	<b>Presentation &amp; discussion - shifts in regional OA patterns</b> – Richard Feely (NOAA) <ul style="list-style-type: none"> <li>• Overview of regional OA patterns</li> <li>• Aragonite impairment threshold</li> <li>• Seasonality + anthropogenic CO<sub>2</sub> signal in territorial waters</li> </ul>
10:00 a.m.	<b>Presentation &amp; discussion - OA indicators of biological impact</b> – Nina Bednarsek (OSU) <ul style="list-style-type: none"> <li>• Pteropod/aragonite bioindicator overview</li> <li>• Shell dissolution metric overview</li> <li>• Translating anthropogenic CO<sub>2</sub> change to population level effects</li> <li>• Dungeness crab bioindicator overview</li> </ul>
10:50 a.m.	<b>Break</b>
11:00 a.m.	<b>Presentation &amp; Discussion</b> - Interpreting seasonal shifts in OAH parameters to understand species and life stage-specific vulnerabilities – Simone Alin (NOAA), Nina Bednarsek
11:25 a.m.	<b>Discussion</b> – Richard Feely, Nina Bednarsek, Simone Alin <ul style="list-style-type: none"> <li>• Areas of uncertainty – data gaps – critical analyses</li> </ul>
12:00 p.m.	<b>Adjourn</b>

### **Alternative formats**

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email [deqinfo@deq.oregon.gov](mailto:deqinfo@deq.oregon.gov).