SOUTHEAT ALASKA TRIBAL TOXINS

SEATOR
Culture
Science
Efficiency
Southeast Alaska Tribal Ocean Research

A Partnership to Monitor Harmful Algal Blooms
Projects and Programs

- Southeast Alaska Tribal Toxins (SEATT)
- Southeast Alaska Regional Ocean Acidification Monitoring (SEAROAM)
- Sitka Tribe of Alaska Environmental Regulatory Lab (STAERL)
- Integrated *Alexandrium* Cyst bed Mapping in Southeast Alaska (IACSEA)
WHY DO WE NEED SEATOR

- Support SE partnered Tribes working on climate change related impacts on the marine environment
- Outreach, community access to data, training
- UNIFIED CREDIBILITY
A *Common Concern* about subsistence clam resources

- No assistance from AK state agencies
- STA reached out to SE Tribes
- FY 15 EPA IGAP funds for baseline phytoplankton

Create an early warning system

**SouthEast Alaska Tribal Toxins**

November 2013
Subsistence user groups play **toxin roulette** when harvesting bivalves in Alaska.

Coastal Alaskan Native populations are 12 times more likely to be affected by PSP than the Caucasian community because of the greater use of subsistence foods (Gessner and Schloss, 1996).
PSP was first acknowledged as an environmental problem in 1799 when the crew of Alexander Baranof from the Russian American Trading Company ingested blue mussels containing high levels of PSP in southeast Alaska (Fortuine 1975).
### Human Health Syndromes — Associated with Phytoplankton

<table>
<thead>
<tr>
<th>Syndrome</th>
<th>Species and Toxin</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amnesic Shellfish Poisoning (ASP)</td>
<td><em>Pseudo-nitzschia</em> Domoic acid</td>
<td>Permanent short term memory loss</td>
</tr>
<tr>
<td>Ciguatera Fish Poisoning (CFP)</td>
<td><em>Gambierdiscus toxicus</em> Ciguatoxin &amp; Maitotoxin</td>
<td>Temperature Sensation Reversal</td>
</tr>
<tr>
<td>Diarrhetic Shellfish Poisoning (DSP)</td>
<td><em>Dinophysis</em> Okadaic acid</td>
<td>Diarrhea Nausea Vomiting</td>
</tr>
<tr>
<td>Neurotoxic Shellfish Poisoning (NSP)</td>
<td><em>Karenia brevis</em> Brevetoxin</td>
<td>Gastrointestinal and Neurological Problems</td>
</tr>
<tr>
<td>Paralytic Shellfish Poisoning (PSP)</td>
<td><em>Alexandrium</em> Saxitoxin</td>
<td>Loss of motor control</td>
</tr>
</tbody>
</table>
Who Regulates for PSP and toxins in Alaska?

- Alaska Department of Environmental Conservation follows FDA regulations for all commercially harvested shellfish in Alaska under the National Shellfish Sanitation Program

- Turn around time---data lag
What about subsistence users?

- Alaska has **NO SUBSISTENCE OR RECREATIONAL** regulatory testing.
- ADEC will not certify any intertidal harvest for subsistence use.
What does monitoring look like?
Other Partnerships doing HAB Monitoring

- Olympic Region Harmful Algal Bloom (ORHAB) Partnership
  - Tribes
  - NOAA
  - Volunteers
  - Non-Profits
  - Shellfish Growers

- SoundToxins Partnership
  - Tribes
  - NOAA
  - Volunteers
  - Non-Profits
  - Shellfish Growers

www.orhab.org
www.soundtoxins.org
Equipment
• Digital Microscope with Camera
• Refractometer and Thermometer
• Phytoplankton Net
• Filtering apparatus
• Identification tools

Training
• Workshops in Sitka
• Sampling Manual
• Videos
• Site Visits

Updates to www.seator.org
Began in early May 2015

Largest bloom spatially to date

Lasted months instead of 1-2 weeks

Closed shellfish beds in all 4 west coast states

Average chlorophyll concentrations (milligrams per cubic meter of water) in July 2015. The darkest green areas have the highest surface chlorophyll concentrations and the largest amounts of phytoplankton—including both toxic and harmless species. NOAA Climate.gov map based on Suomi NPP satellite data provided by NOAA View.
Where does all the data go?

- SoundToxin Database and Phytoplankton Monitoring Network (NOAA)
  - National database for all monitoring groups
  - Used by researchers, shellfish growers, and resource managers for early warning system

http://www.seator.org/
Interactive Mapping Tool

Shellfish Safety Information

Legend
- Open
- Conditionally Open
- Closed
- Unclassified

Public Shellfish Reaches
- Green
- Orange
- Red
- Unclassified

Marine Biotoxin Closure Zones
- Closed for all species including clams, geoduck, scallops, mussels, oysters, snails and other invertebrates.
- Closed for Butter and Varnish Clams only
- Closed for Varnish Clams only
- Closed for Butter Clams only

Shellfish Harvest Area Classification
- Approved
- Conditionally Approved
- Unclassified
- Unclassified
- Closed Due to Pollution
- Vibriosis Advisory Area

WDFW Seasons & Regulations

Find us on Facebook
Benefits for REAL Time Monitoring

- EARLY WARNING system
- Develop forecasting tools
- Provide outreach to Tribal and Non-Tribal Citizens about the potential for health risk related to subsistence harvest.
- Coordinate with local and state health departments

Ketchikan *noctiluca* bloom 2009
Developed to support SE Tribes (SEATT) with shellfish toxin analysis.
- Provide **regulatory** data to Tribes and communities to assess their vulnerability to risk associated with biotoxins.
- Tribes can use STAERL to develop subsistence shellfish management plans
FUNDING

- **SEATT**: EPA IGAP -$20K/Tribe/year (~$250/yr)
- **SEATT**: EPA IGAP workshops-$150K (STA)
- **SEAROAM**: BIA Climate Change Program-$210K (STA)
- **SEATOR site/SEATT training**: BIA Climate Change Program-$50K (STA)
- **STAERL**: ANA Environmental Regulatory Enhancement Program-$580K (STA)
- **IACSEA**: NOAA Coastal Resilience Program-$860K (STA/UAF) (pending)

$1.5 million as of FY16 (*or $2.4 million)
Other Partners

- NOAA – Northwest Fisheries Science Center and Charleston Marine Biotoxin Program/PMN
- University of Alaska Fairbanks School of Fisheries and Ocean Science
- Southeast Alaska Regional Dive Fisheries Association (SAR DFA)
- Washington State Department of Health Marine Biotoxin Program
- Alaska Department of Environmental Conservation (EHL)
Questions or Comments?

Chris Whitehead
Environmental Program Manager
Sitka Tribe of Alaska
Resource Protection Department
907-747-7395
chris.whitehead@sitkatribe-nsn.gov
www.seator.org