



Western Washington University  
Western CEDAR

---

Salish Sea Ecosystem Conference

2020 Salish Sea Ecosystem Conference  
(Online)

---

Apr 21st, 9:00 AM - Apr 22nd, 4:45 PM

## Monitoring Coccolithophore blooms in Hood Canal

Seth Book

Skokomish Indian Tribe, sbook@skokomish.org

Follow this and additional works at: <https://cedar.wwu.edu/ssec>



Part of the [Fresh Water Studies Commons](#), [Marine Biology Commons](#), [Natural Resources and Conservation Commons](#), and the [Terrestrial and Aquatic Ecology Commons](#)

---

Book, Seth, "Monitoring Coccolithophore blooms in Hood Canal" (2020). *Salish Sea Ecosystem Conference*. 60.

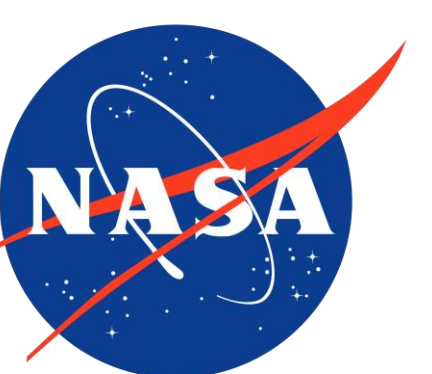
<https://cedar.wwu.edu/ssec/2020ssec/allsessions/60>

This Event is brought to you for free and open access by the Conferences and Events at Western CEDAR. It has been accepted for inclusion in Salish Sea Ecosystem Conference by an authorized administrator of Western CEDAR. For more information, please contact [westerncedar@wwu.edu](mailto:westerncedar@wwu.edu).



# Coccolithophore Blooms in Hood Canal and impacts on marine resources

Seth Book, Blair Paul, Julian Sammons, Aaron Bentson-Royal, Damon Freitag, Maso Roqueni-Galbreath, Jeanne Shepherd and Sang- Seon Yun  
Skokomish Indian Tribe Department of Natural Resources



## Background and Rationale

Coastal communities such as the Skokomish people of Hood Canal need to be prepared to deal with the environmental challenges that adversely affect fisheries resources. Non-toxic blooms of the coccolithophore *Emiliana huxleyi* that have occurred over the last four years raise concerns over the potential adverse effects on marine resources, in particular, shellfish resources in Hood Canal (Houdan et al., 2004). However, very little is known what are causing such coccolithophore blooms in Hood Canal and what are the likely consequences of such blooms on Tribal marine resources. With the support of BIA, the Skokomish Environmental Lab has been undertaken multi-faceted research to develop a coastal and ocean plan to deal with such environmental events to protect the Skokomish peoples' treaty rights to marine and fisheries resources

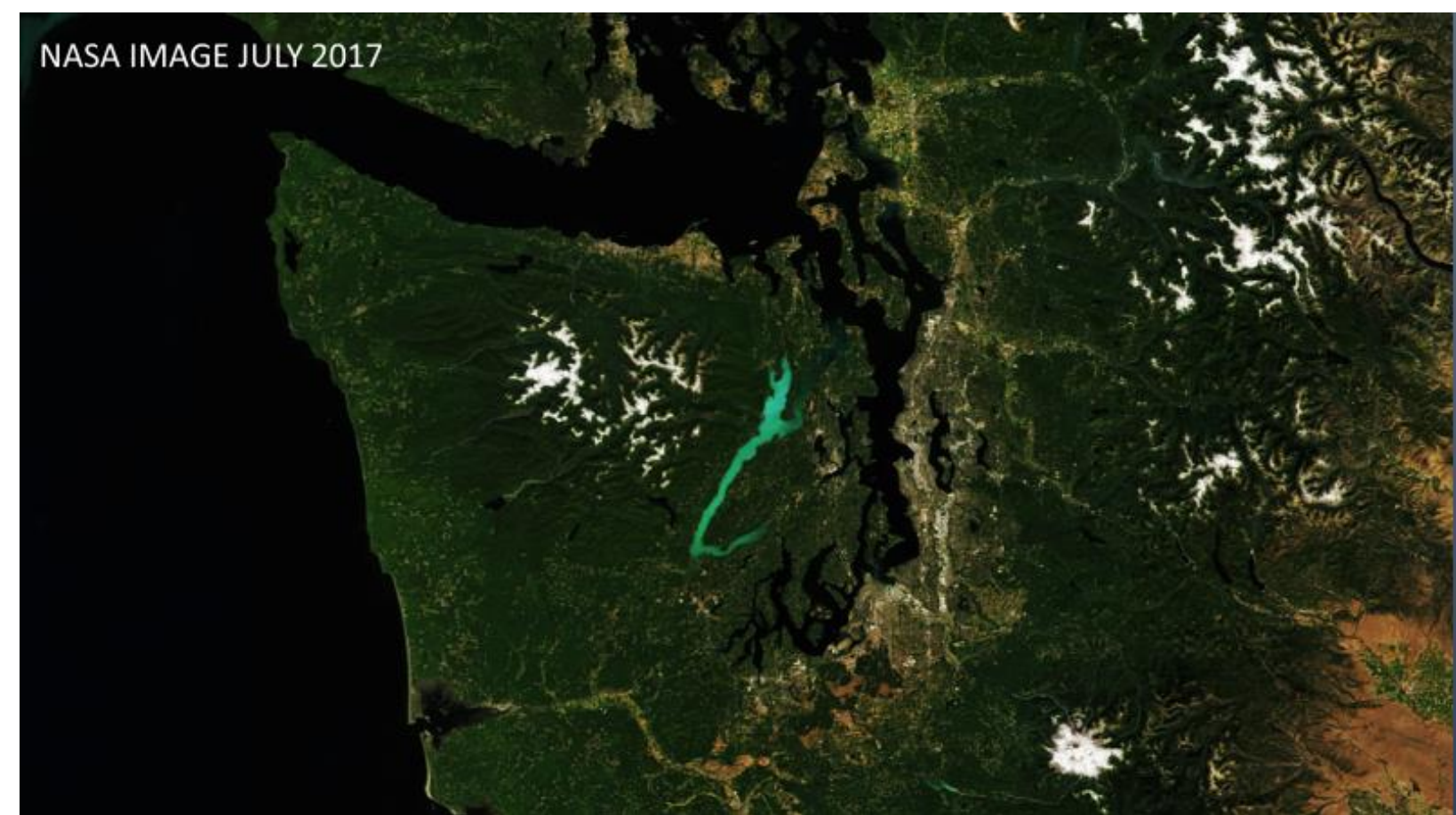
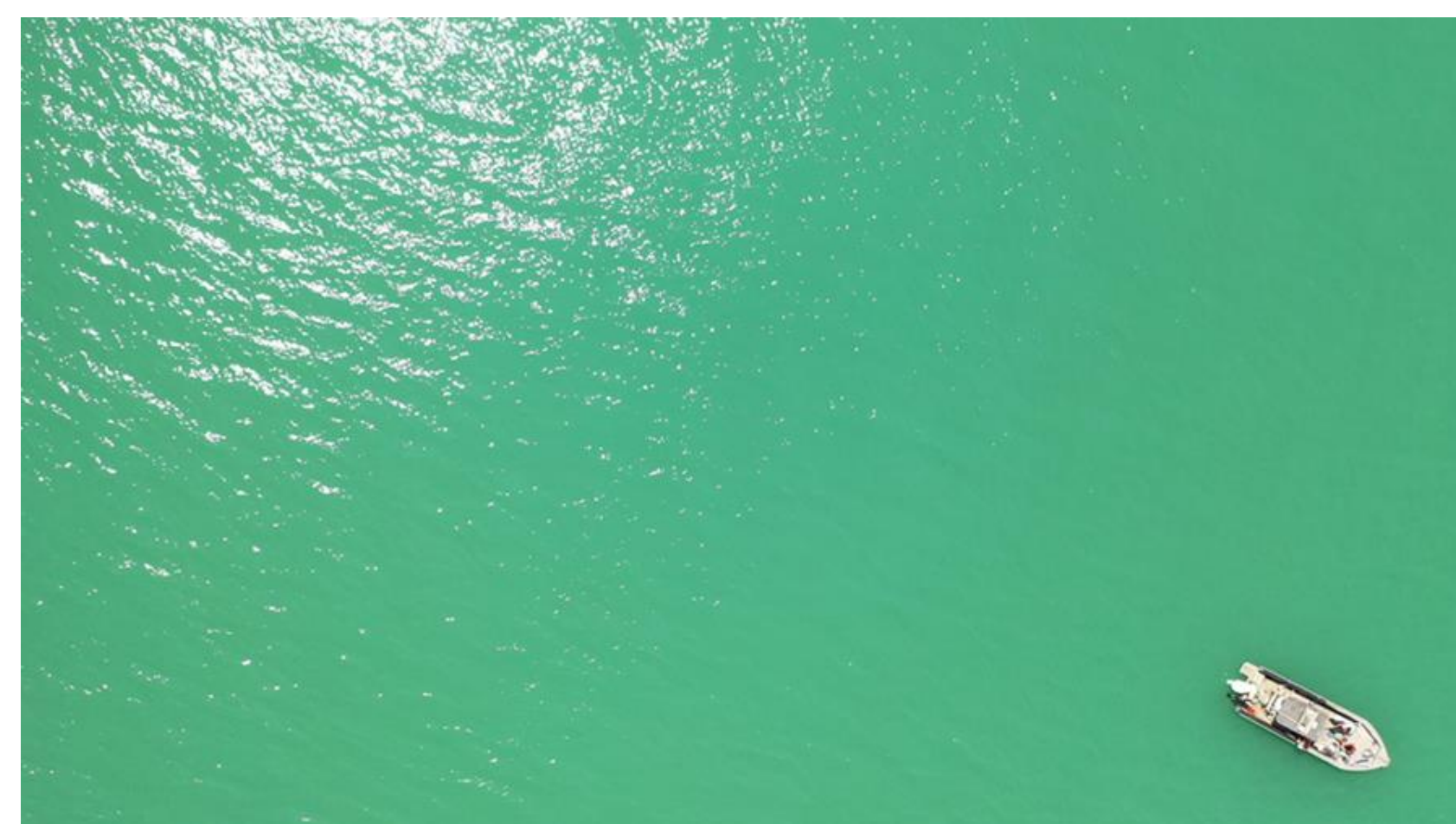


Photo: Christopher Krems, 2019 Eyes over Puget Sound



Photos: Julian Sammons, drone FAA pilot, Skokomish DNR

Figure 1. Coccolithophore blooms in Hood Canal.

## Methods

To understand the cause and potential impacts of coccolithophore blooms in Hood Canal, various environmental parameters are being surveyed including light conditions, nutrients, chlorophyll a and temperature.

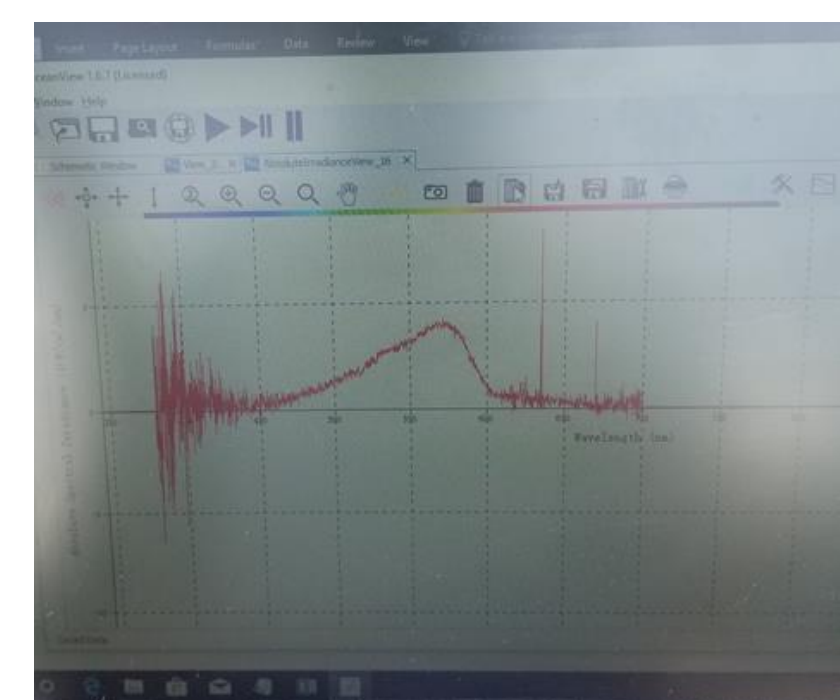


Figure 2. VIS-NIR spectrogram



Figure 3. Depth profile sampling of irradiance



Figure 4. Visibility measured using Secchi disk

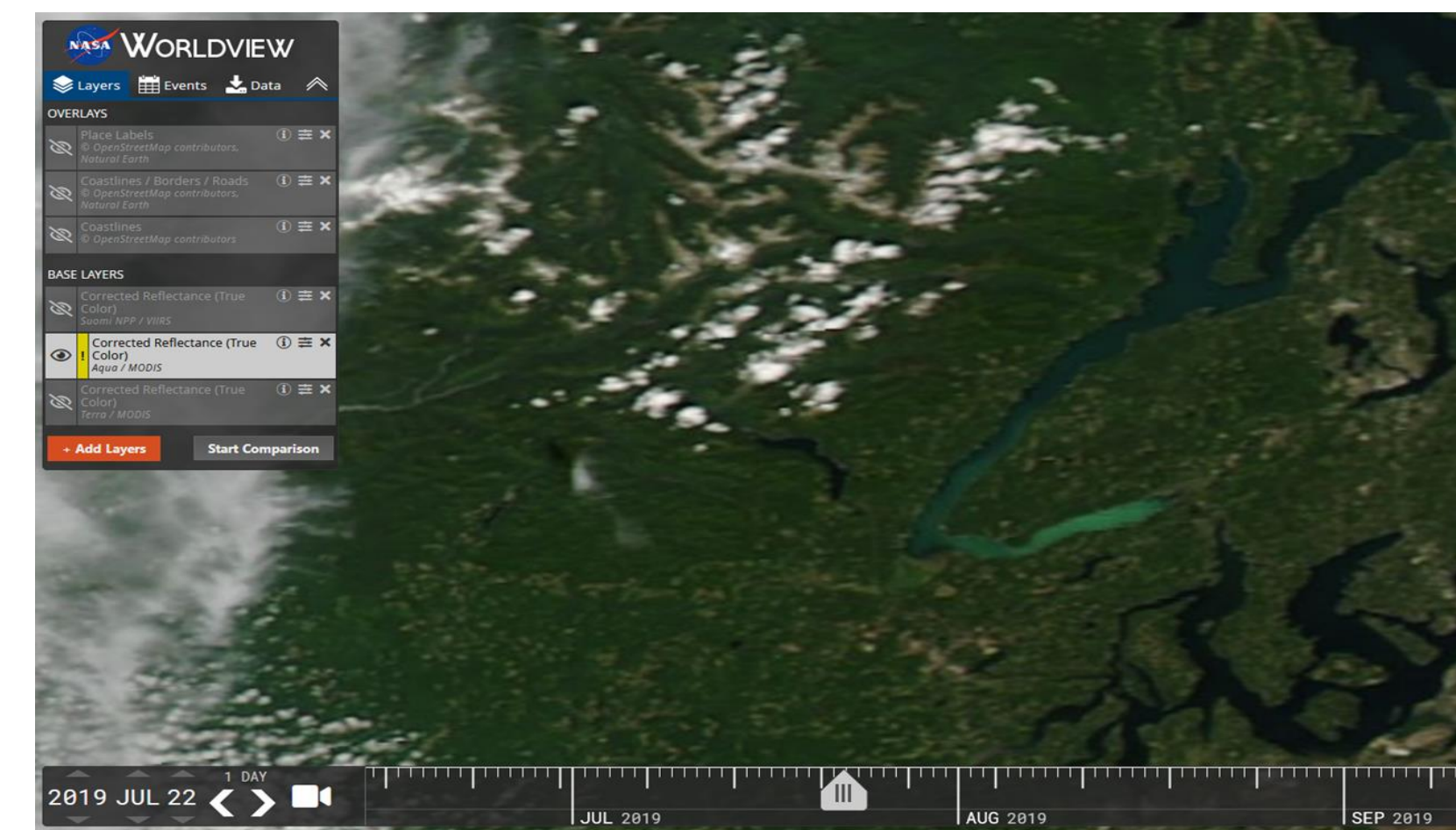
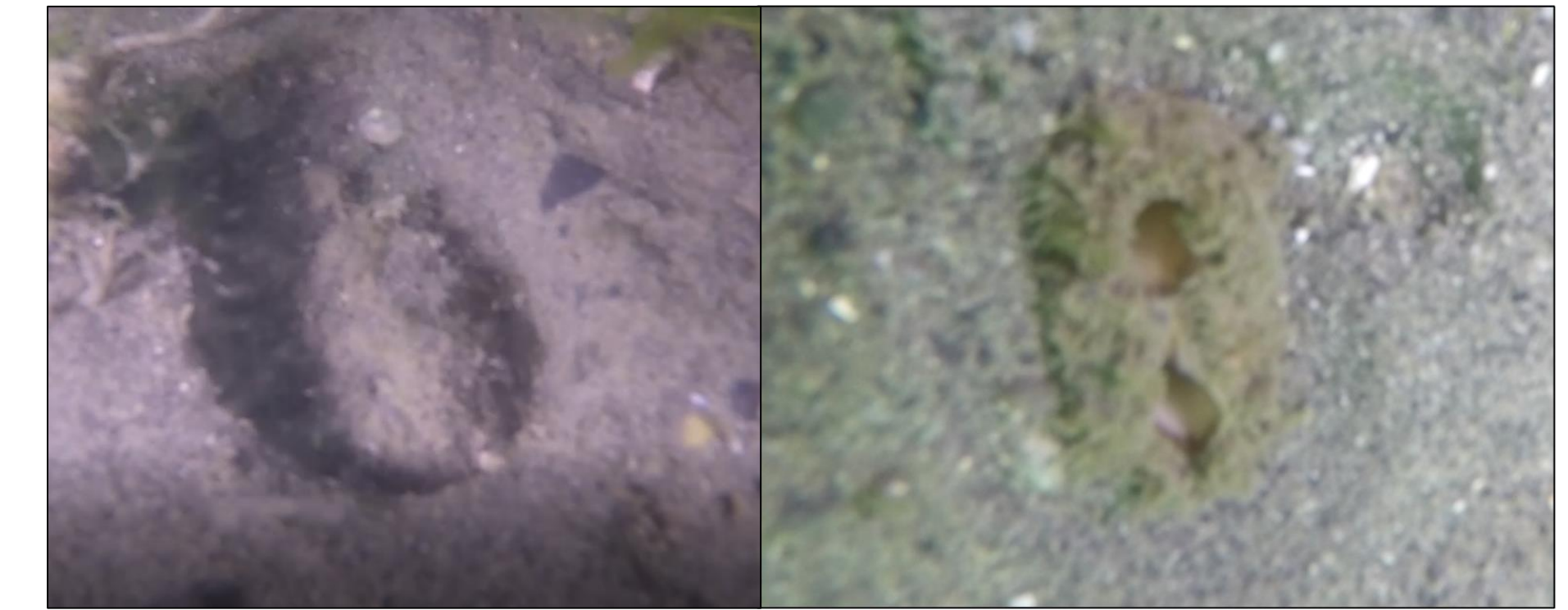


Figure 5. Monitoring of the coccolithophore blooms using remote sensing

What are the impact to the shellfish resource?



Photo's by Blair Paul (2017), Skokomish Tribe via GoPro

Figure 6. Geoduck cease feeding during bloom

## Results

The coccolithophore blooms occurring in Hood Canal are comprised of *Emiliana huxleyi*. Environmental data compiled could suggest some likely causes of *E. huxleyi* blooms in Hood Canal.

Figure 5. SEM images of *E. huxleyi* coccolithophore blooms in Hood Canal. Courtesy of Bill Brian of NOAA and Dr. Gerardo Chin-Leo of The Evergreen State College.

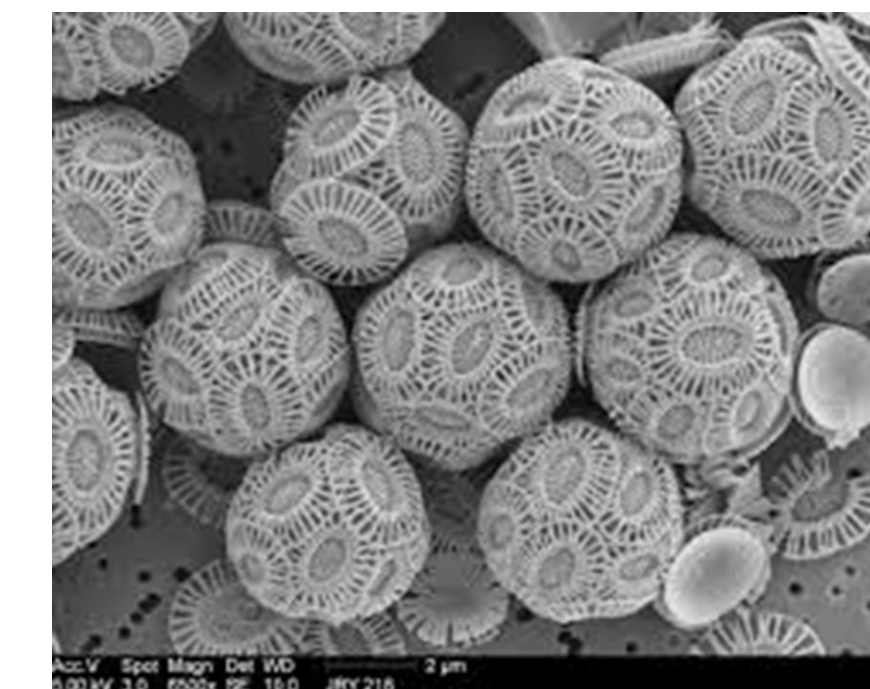
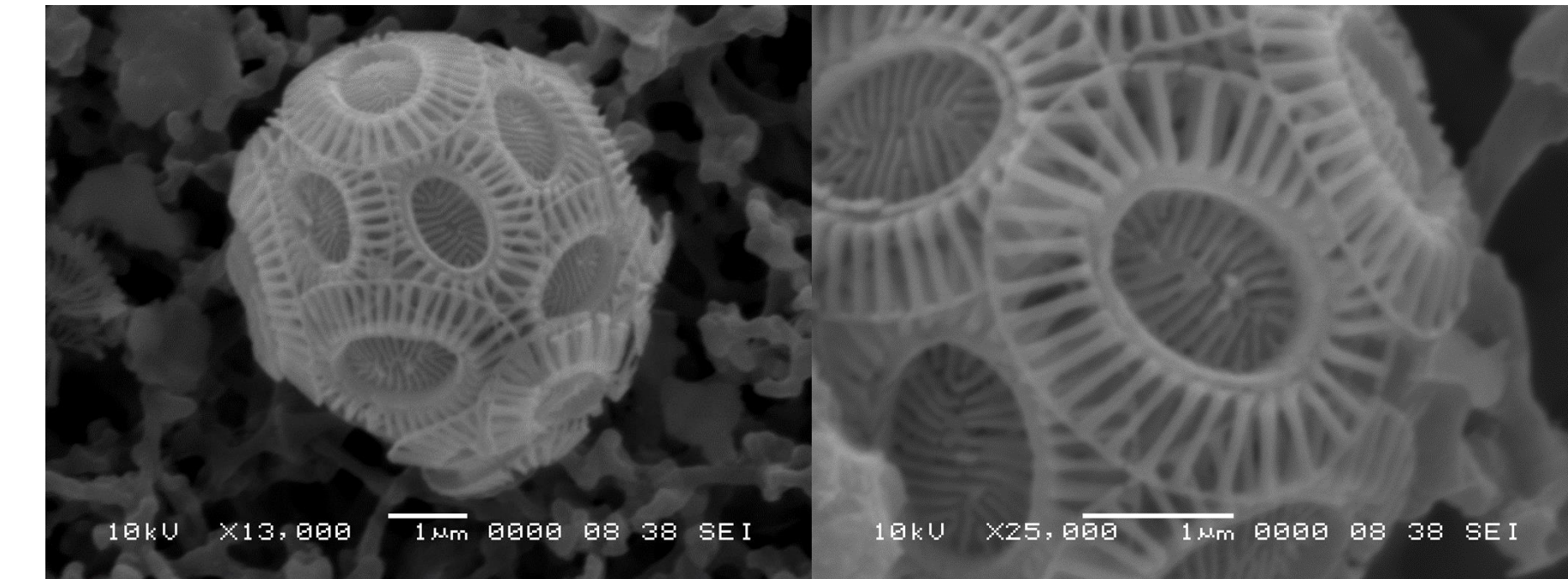


Photo: Brian Bill, NOAA



Photos: Gerardo Chin-Leo, The Evergreen State College



Satellite Imagery: NASA

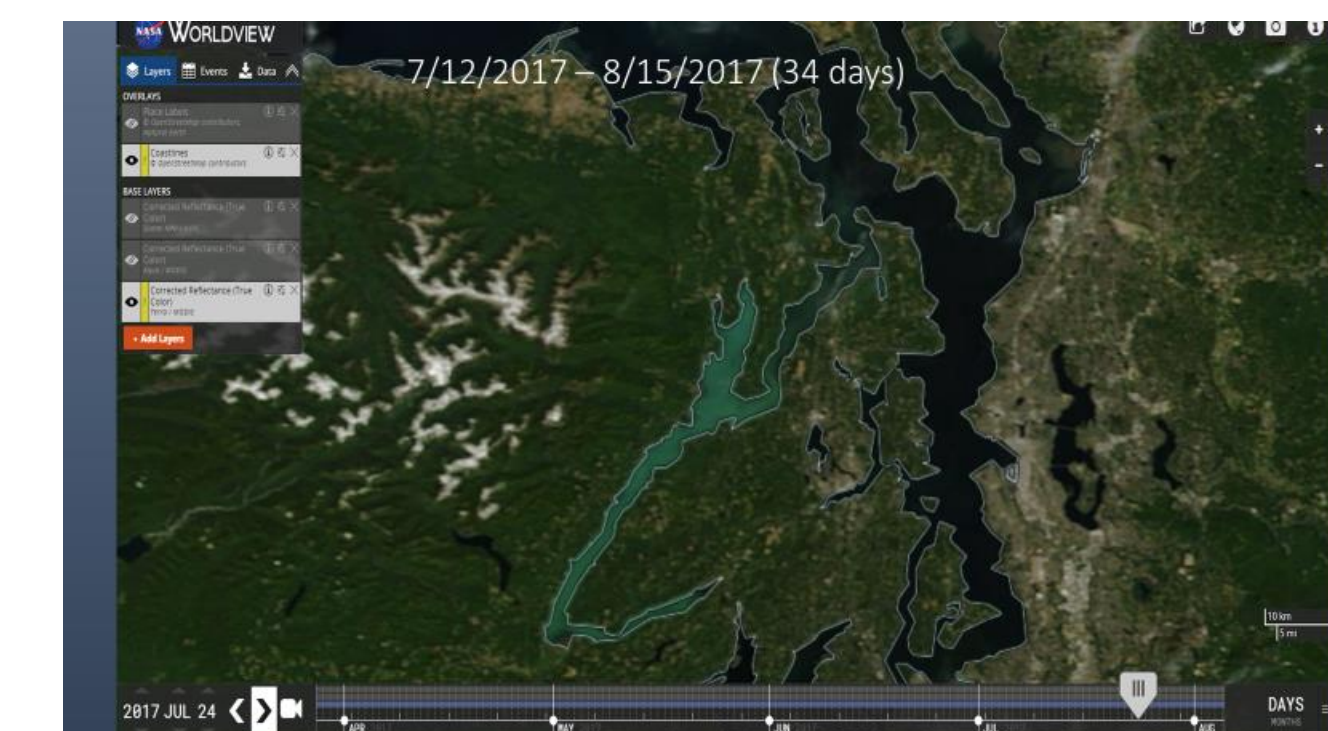


Figure 6. Satellite images of the coccolithophore blooms in Hood Canal in 2016 and 2017.

## Conclusions

The occurrence of coccolithophore blooms in Hood Canal over the last four years suggests that some environmental conditions in the Hood Canal have contributed to such bloom events. The Skokomish Tribe will be working to better understand the causes and the potential impacts of such blooms in Hood Canal. Based on that information, we will be able to develop a management plan to mitigate the impacts of future blooms.

## Acknowledgments

We would like to thank the Skokomish Indian Tribe' council for their support. This work was supported by Skokomish Indian Tribe, BIA Tribal Resilience Program, and EPA Performance Partnership Grant, NOAA, The Evergreen State College, Eyes Over Puget Sound, and NASA.

## References

Houdan et al., (2004) J. Plankton Res. 26; 875-883.