



1st & 2nd Quarter: Feb 1, 2019 - July 31, 2019

Greetings!

We are well into monitoring year 8! Gulf Watch Alaska (GWA) principal investigators (PIs) have been monitoring away and data continues to flow. This year the program is focused on science syntheses and we will be submitting a science synthesis report to the *Exxon Valdez* Oil Spill Trustee Council (EVOSTC) in advance of attending their synthesis workshop in early 2020. The theme of our synthesis products will be long-term monitoring and the marine heat wave. The marine heat wave has certainly made its way into the public eye as reports highlight anomalous ocean conditions, mass die-offs of marine birds and mammals, and disease outbreaks. This has definitely piqued the interest of our PIs and their long-term datasets will be useful in gauging the intensity of these perturbations. Who said monitoring was boring? Here is a brief summary of our program's activities and accomplishments:

Science Update:

- Brief highlight - Environmental Drivers Component findings:
 - The GAK 1 mooring, an almost 50-year time series, continues to demonstrate a long-term warming trend punctuated by signals associated with the cycles of El Niño and other phenomena such as the marine heat wave.
 - PWS oceanography data showed temperature trends in 2017 returned to near the long-term average, but anomalies in 2018 and 2019 were again primarily positive.
 - Seward Line preliminary data for 2019 suggest some increase of southern zooplankton species during summer.
 - Continuous Plankton Recorder data showed plankton responded clearly and rapidly to the warm conditions of 2014-2016, with changes evident in abundance, composition and timing.
 - Lower Cook Inlet and Kachemak Bay Oceanography showed zooplankton increased in the abundance of warm water species as was observed in PWS and along the Seward Line.
- GWA's Program Lead and Science Coordinator participated in NOAA Fisheries workshops where GWA data are contributing to ecosystem-based fisheries management efforts.
- The GWA Science Coordinator worked with PIs to develop additional time series indicators to describe the current ecosystem status for the Gulf of Alaska. In 2019 we will contribute at least 18 ecosystem indicators from all GWA components to the NOAA Fisheries Gulf of Alaska Ecosystems Status Report to the North Pacific Fisheries Management Council.
- GWA's Science Coordinator continued working with PIs on drafting four cross-component science synthesis manuscripts that include data within and outside of GWA. The manuscripts will be compiled into the synthesis report for EVOSTC.
- Our Science Coordinator is leading one of the four science synthesis manuscripts. To date, the manuscript includes more than 65 time series from all GWA components and the Herring Research and Monitoring (HRM) program in the synthesis of "Ecosystem variability in the Gulf of Alaska during a marine heatwave."
- Hot off the press:
 - Konar et al. 2019. Wasting disease and static environmental variables drive sea star assemblages in the Northern Gulf of Alaska. *JEMBE* vol 520, November.
doi.org/10.1016/j.jembe.2019.151209

Program Management Team (PMT):

- The GWA PMT coordinated with PIs to successfully submit program and project annual reports for FY18. Annual reports were submitted a month late due to the federal government shutdown and the GWA program appreciates EVOSTC staff's understanding of the unusual circumstances during and following the shutdown.
- The PMT held a one-day video conference in April to coordinate GWA oversight and key activities for FY19 and beyond.
- Our PMT held two quarterly PI teleconferences during which the conversation focused on science synthesis, upcoming field work, and field observations.
- The GWA PMT worked with EVOSTC staff, the HRM Program Lead, and GWA PIs to schedule the science synthesis workshop for February 2020.
- Our PMT recruited a new Science Review Panel member, Dr. Ron Heintz (retired, NOAA Fisheries), following the retirement from the program of past Science Review Panel member Dr. Leslie Holland-Bartels (retired, USGS).
- The GWA PMT planned for the fall GWA program PI meeting which will be held in Homer, October 8-10, 2019 in conjunction with the HRM program PI meeting.
- The PMT effectively coordinated with GWA PIs on submission of FY20 workplans to the EVOSTC.
- Additional stats highlighting the GWA program achievements in the past year:
 - Program PIs produced five peer-reviewed publications, have 15 manuscripts in prep, and supported completion of one PhD dissertation.
 - Outreach efforts included 40 presentations, seven articles, and six outreach events, including planning for two EVOS 30th anniversary events. 30 years! Can you believe it?

Data Management:

- The Data Management Team (DMT) continued to work with GWA researchers to perform annual updates and curation of remaining data from the 2018 season and incoming data from the 2019 season.
- The DMT released two versions of the Gulf of Alaska data portal (v2.9-2.10) to improve data catalog, visualizations, and integration systems. For more details see: <https://axiomdatascience.com/portal-updates/>.
- A number of DataONE bugs affecting the Research Workspace Member Node were identified, researched, and steps towards resolution were made to improve GWA project data archival. An improved DataONE citation preview feature for PIs was created to help more easily structure metadata for optimal citations. A Java framework update was implemented that affects most of the underlying code in the Research Workspace, which will improve Axiom's ability to maintain the system and be responsive in delivering future updates.

Outreach:

- GWA PIs participated in an evening of science talks and community conversation in Seldovia, a spill-affected community in the Kachemak Bay area. The event was titled "What's up in Kachemak Bay?" and included work on the marine heatwave, sea star wasting, intertidal creatures, otters and clams, food webs, harmful algae, bird die-offs, and more. Over 35 community members participated in the event and future information sharing from the Gulf Watch Alaska program was requested for future years.
- GWA program team members and PIs contributed to articles in the annual Prince William Sound Science Center publication [Delta Sound Connections](#):
 - 30 years since the *Exxon Valdez* oil spill: an era of scientific research and monitoring that

- has changed our understanding of oil spill impacts
 - What does the future hold for the Gulf of Alaska?
 - Tracking water layers in the ocean
- GWA's Long-term Monitoring of Alaska's Nearshore Ecosystems project was featured in both the spring and summer 2019 issues of the Department of Interior's *Newswave* publication (see Relevant Media section below).
- GWA PIs and projects were featured in news articles around the state (see Relevant Media section below).
- The GWA program management team coordinated with the North Pacific Fisheries Management Council to coordinate outreach presentations at the Council's meeting in Homer in late September and early October 2019.

Relevant Media:

- [In Hot Water](#). *Science*. (February 1, 2019). Featured: GWA PIs Hopcroft, Arimitsu, Piatt.
- [Alaska Faces Tough Choices As Climate Change Effects Become Plain](#). *Alaska Daily News*. (February 22, 2019). Featured: GWA Program.
- [Why Hundreds of Puffins Washed Up Dead on an Alaskan Beach](#). *The Atlantic*. (May 29, 2019). Featured: GWA PI Kuletz.
- [Sea Star Wasting](#). *KTOO*. (June 5, 2019). Featured: GWA PI Konar.
- [Scientists Warn Of Too Many Pink Salmon In North Pacific](#). *Alaska Daily News*. (August 2019). Featured: GWA PI Batten.
- [Nearshore Monitoring & Marine Bird Die-Off](#). *DOI Newswave*. (Spring 2019). Featured: GWA Nearshore Component.
- [Summer Photo Edition, Marine Bird & Mammal Survey](#). *DOI Newswave*. (Summer 2019). Featured: GWA Nearshore Component.

Important Upcoming Dates:

- **October 8-10, 2019** - GWA annual PI meeting in Homer, Alaska (HRM annual meeting to be held concurrently on October 10)
- **October 11, 2019** - EVOSTC Annual Trustee Council Meeting
- **December 1, 2019** - Draft science synthesis reports due to EVOSTC staff

Gulf Watch Alaska quarterly photo:

See next page...



*Hurray! The R/V Nanuq, GAK-1's new support vessel, racing off to get more data!
(Seth Danielson, Univ. of Alaska Fairbanks).*