A total of 25 plankton net pulls were conducted in the waters of Juneau during from May 7 to September 17, 2018. Protocol followed permit CF-18-051 issued by the Alaska Department of Fish and Game.

*SEA-GEAR* Model 9100 Student Plankton Net, 8 cm diameter 3:1 size is attached to a 65-foot-long Willapa Marine Leaded Line rope marked with a knot at 50 feet. A 4-pound lead weight attached to the collar to weight the fall to the bottom of the photo zone, 50 feet. A collection jar screws into a collet at the base of the net.

Samples are processed in the office to filter out the ocean water leaving only the plankton residue on a sterile filter. This is wrapped in aluminum foil and placed in a zip lock bag along with the data collection sheet and placed in the freezer. We do no analysis of the plankton samples.

The samples have been provided to Dr. Elizabeth D. Tobin, Postdoctoral Fellow and Biological Oceanographer with the College of Fisheries and Ocean Sciences of the University of Alaska Fairbanks at the Juneau Center. She is using this as part of her social-ecological systems research addressing the ecology of *Alexandrium* harmful algal blooms and their sociocultural impacts in Southeast Alaska as well as further understanding the role of phytoplankton in our ocean environment.

Plankton pulls are made in Stephens Passage (usually called “Back of Douglas”), the waters of South Shelter Island, Favorite Channel, Saginaw Channel and North Pass.

As part of our plankton pull, we also measure the water temperature and salinity. Temperature is measured with an alcohol thermometer and salinity with a Vee Gee salinity refractometer.

A four-year sampling comparison may be found at the end of this report.

## Plankton Trends

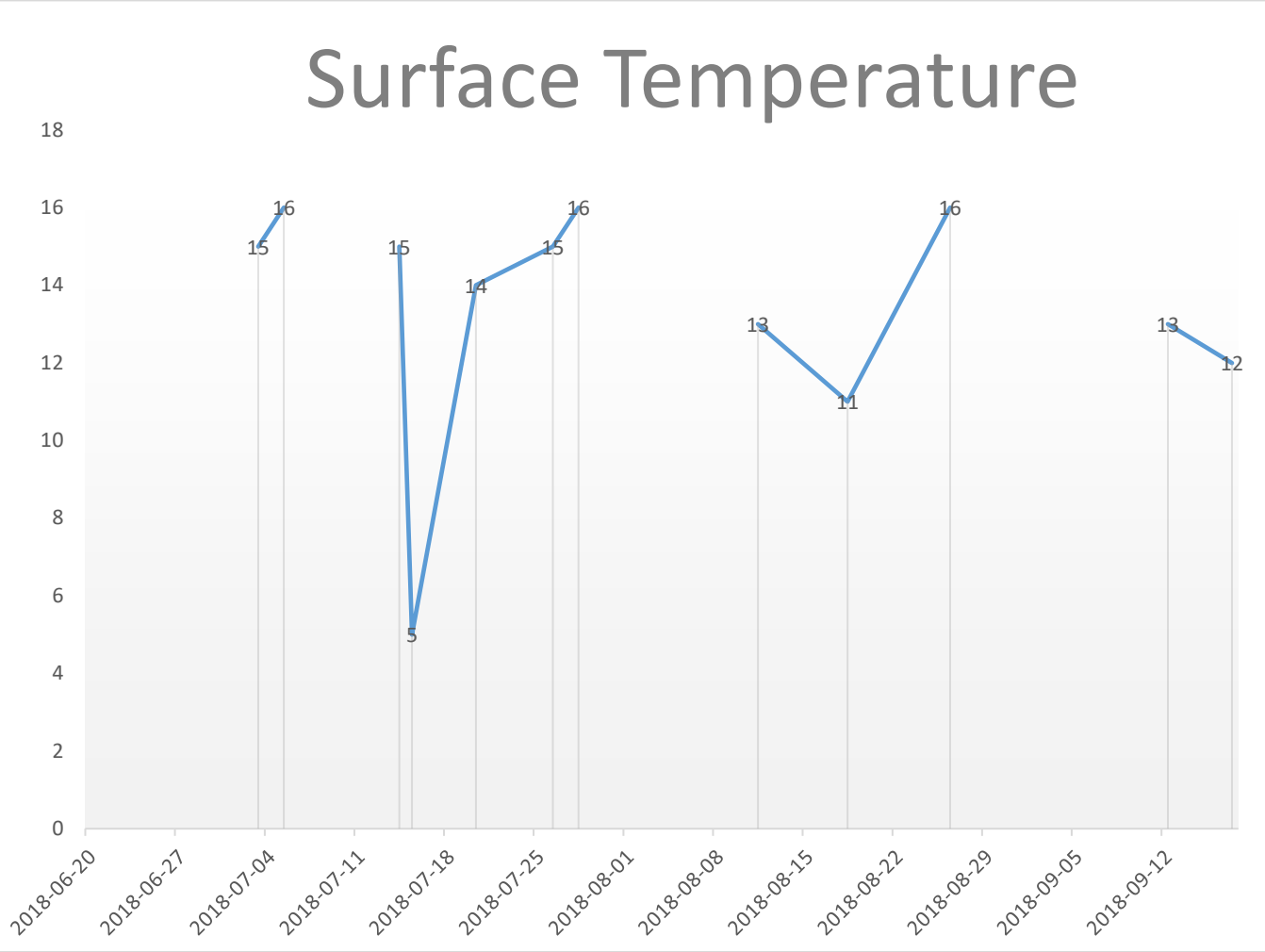
The plankton pulls of 2018 are consistently unremarkable in the quantity of plankton. Visually, most of the bottles had the appearance of very light iced tea. The thickness of the pressed plankton was much thinner than previous years, and especially noticeable when compared with 2016 when the pressed samples were often 3 mm or more thick! This year they were all well below that and averaged 1.5 mm.

In previous years, the amount of pressed plankton (not measured, just estimated) correlated well with the amount of light: the thickness of the sample increased with light until the light began to diminish and the thickness diminished. This year’s samples are remarkably consistent through the season.

When conditions allowed, most naturalists observed the krill and plankton layer on the fish finders on our boats. This year the krill seem to remain below 15 meters and usually around 23 meters. Our pulls are to 50 feet (15.24 meters) so this year’s layer was well above that.

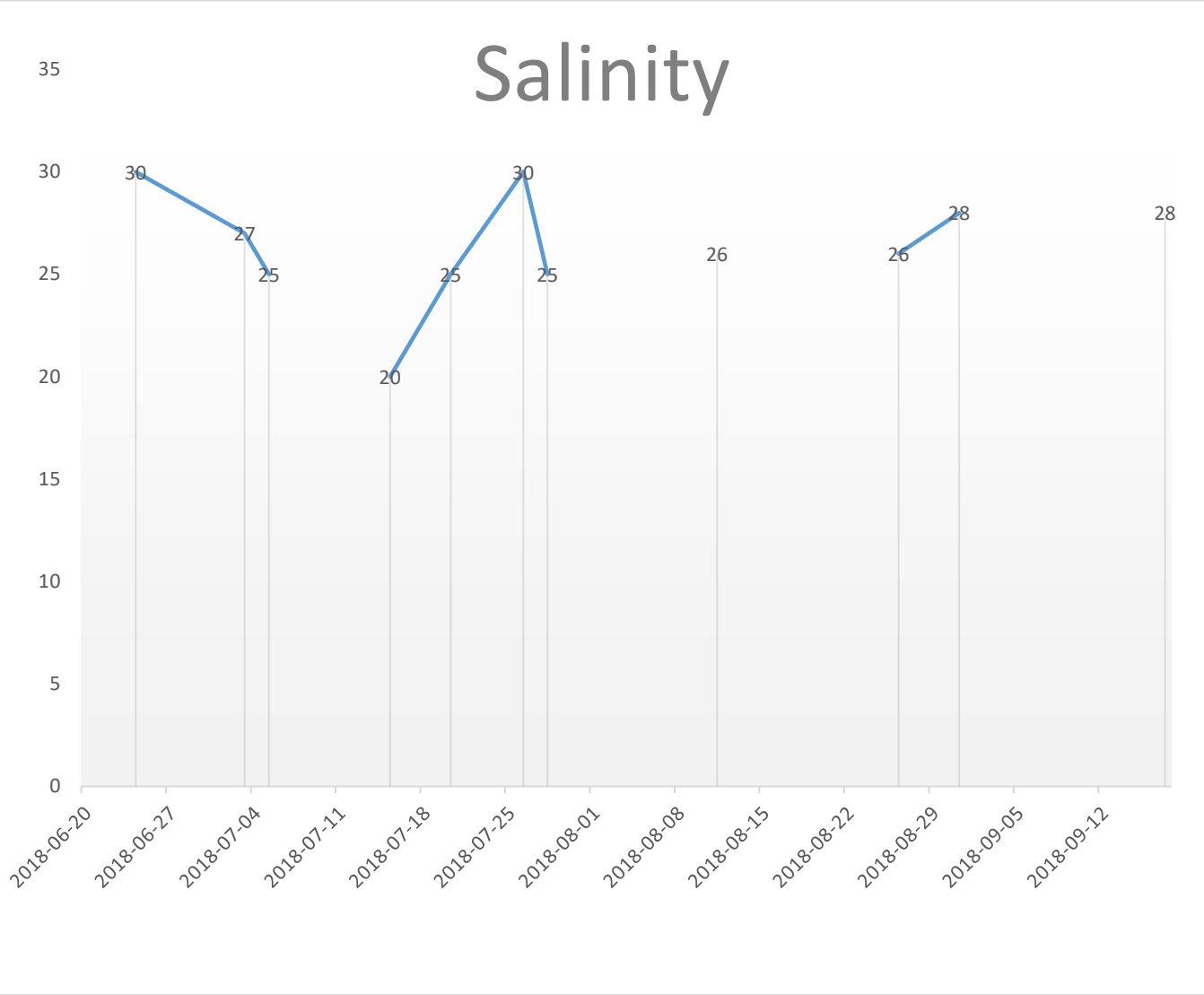
## Surface Temperature

Surface temperature ranged from 4°C to 16°C with an average of 12°C. The trend line shows a slow decline in temperature over the season but a notable outlier of 5°C occurred on July 15. This location is in the influence zone of the Mendenhall River and this was at the beginning of the jökulhlaup and may explain the sudden drop in water temperature. It coincides perfectly with the temperature.



## Salinity

Salinity ranged from 20 to 37 parts per thousand (‰) with an average of 2 ‰. The trend is fairly uniform with the exception of a notable outlier of 20 ‰ occurred on July 15. This location is in the influence zone of the Mendenhall River and this was at the beginning of the jökulhlaup and may explain the sudden drop in water temperature. It coincides perfectly with the temperature.




Salinity shows a steady decline during the sampling season.

## Four Year Sampling Trends

| Year | Low Temp | Hi Temp | Ave Temp | Low Salinity | High Salinity | Ave Salinity |
|---|---|---|---|---|---|---|
| 2015 | Not measured in 2015 | | | 17‰ | 37‰ | 26.0‰ |
| 2016 | 7°C | 19°C | 12.4°C | 16‰ | 40‰ | 26.7‰ |
| 2017 | 6°C | 18°C | 12.2°C | 19‰ | 35‰ | 27.3‰ |
| 2018 | 4°C | 16°C | 11.9°C | 20‰ | 37‰ | 29.0‰ |

With only a four-year sampling period, conclusions based upon these results may not be reliable.

The range of temperature is in a fairly narrow band of 0.5°C and seems consistent, especially with the slow seasonal decline in temperature. The drop in temperature *may* be a result of the waning of the "Pacific Blob" that peaked in our waters in 2016.

The salinity is interesting in that it shows a slight increase of 3‰ over the sampling period. This is a bit counter to the prevailing idea that as glaciers melt, more freshwater enters the ocean. More sampling is required to make any definitive conclusion.

L. Scott Ranger
Lead Science Guide
October 22, 2017

GGC 907-586-2666
Scott 404-210-3088
scott@scottranger.com

Gastineau Guiding Company
1330 Eastaugh Way Ste 2
Juneau, AK 99801