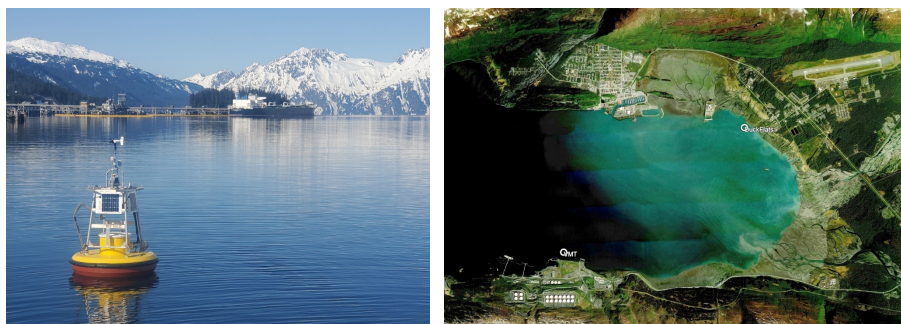


Port Valdez Weather Buoy Analysis

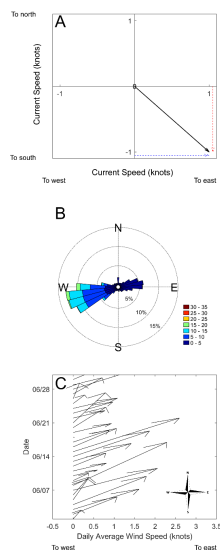
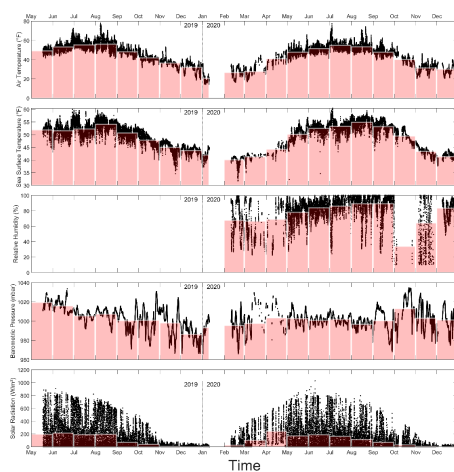
PWSRCAC Board Meeting, 18 Sept. 2026

Rob Campbell
PWS Science Center



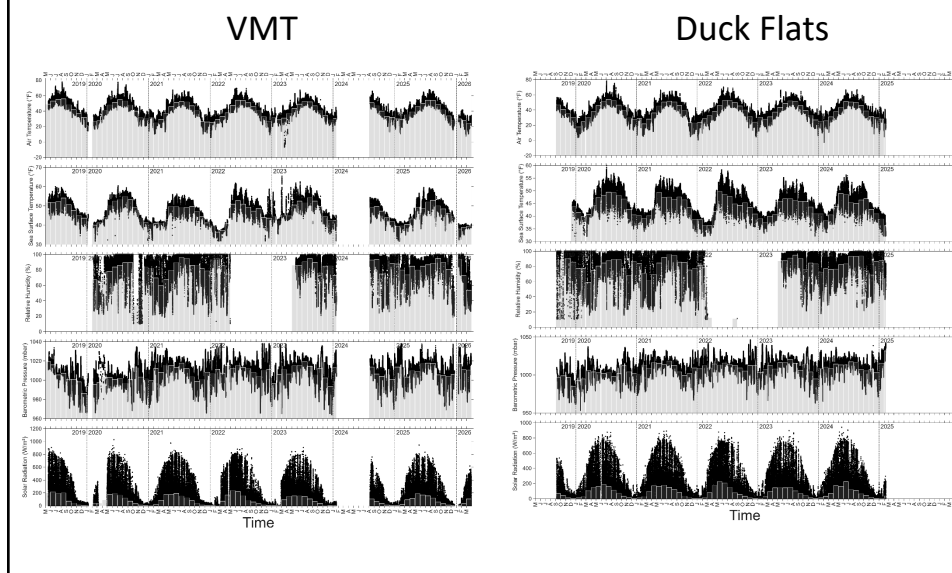
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Scalars vs vectors



2

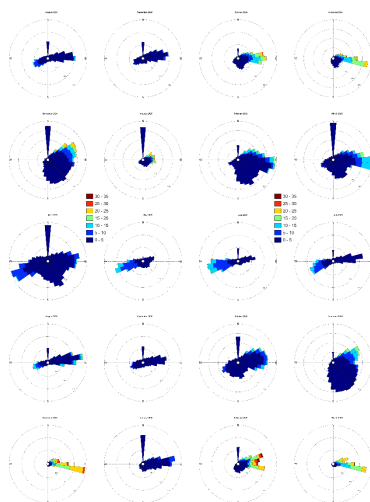
Monthly averages – met and oceanographic



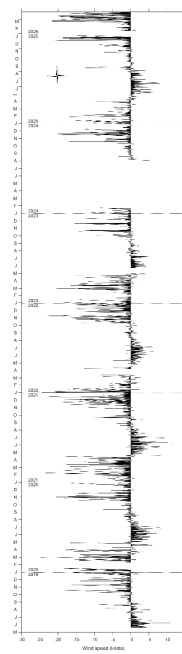
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Winds - VMT

2024-2026 wind roses



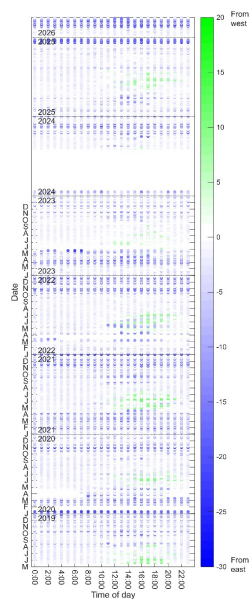
Full time series



4

Sea breezes at VMT

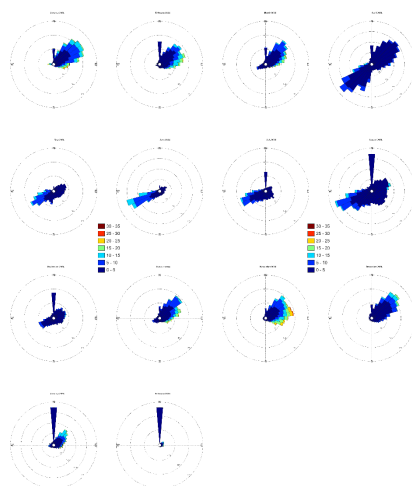
Daily average East-West winds



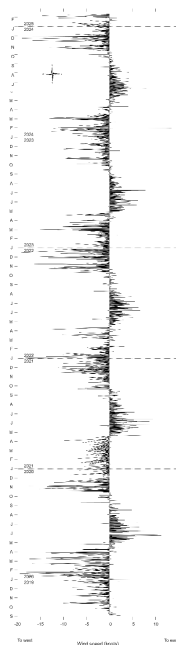
5

Winds – Duck Flats

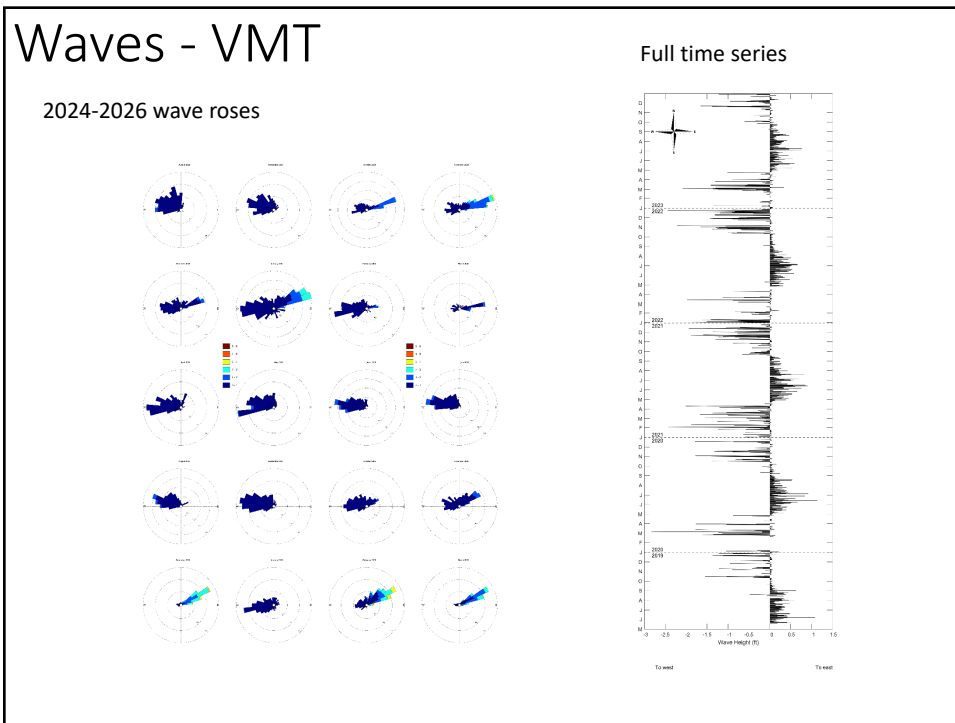
2024-2026 wind roses



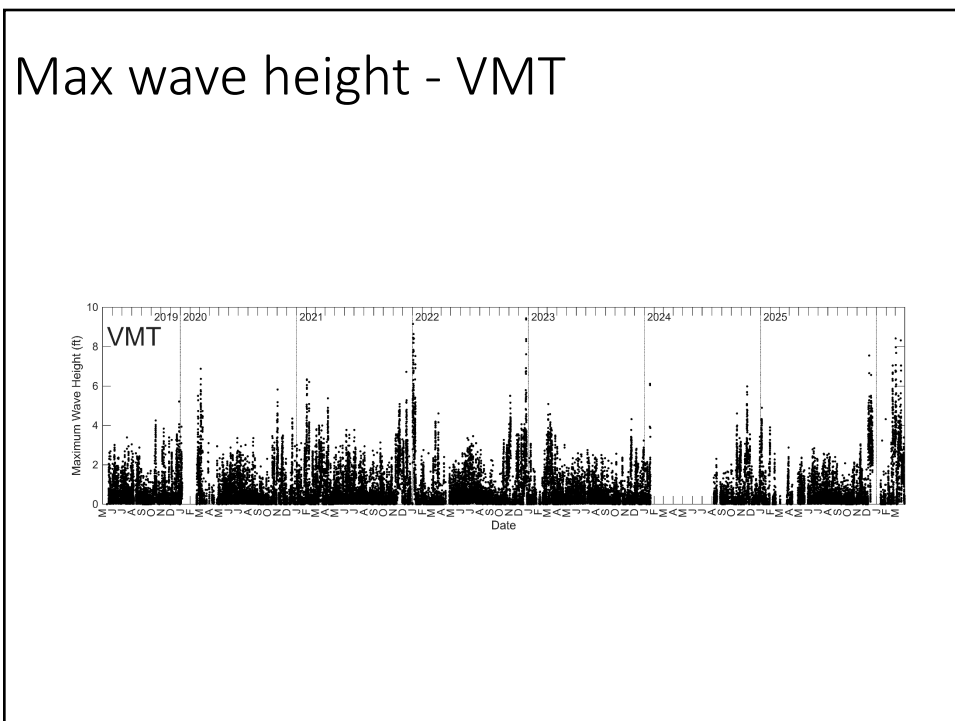
Full time series



6

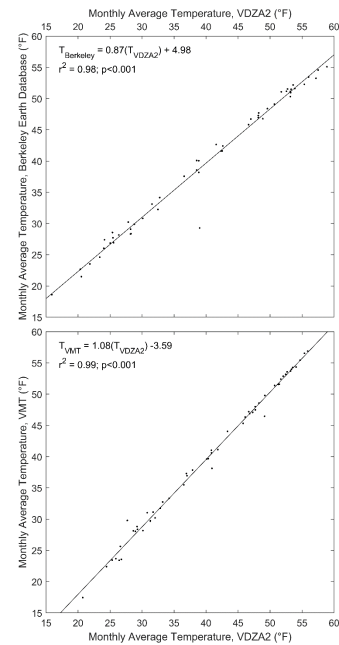
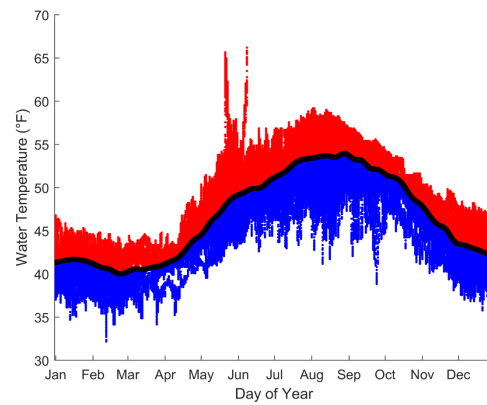


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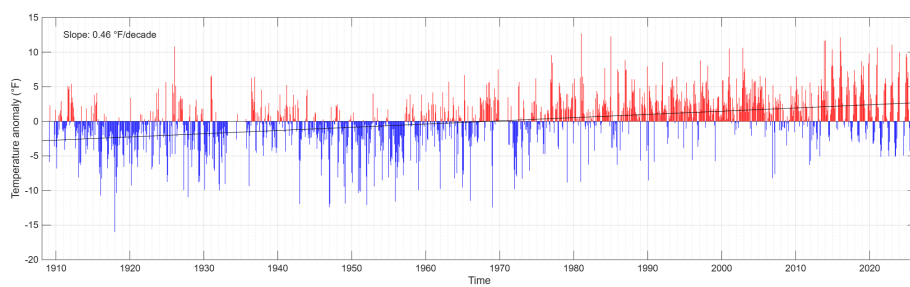
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Temperature anomalies



9

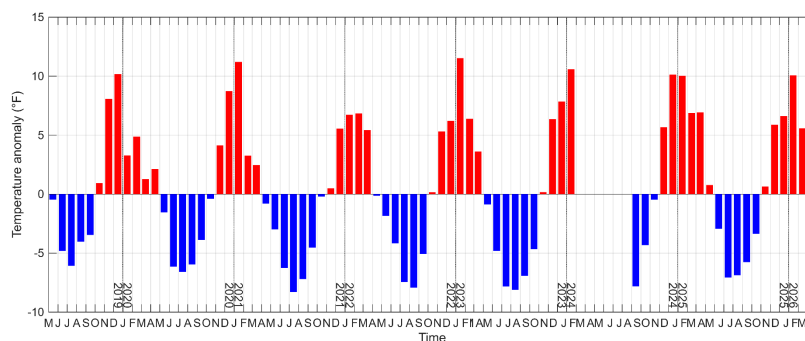
VDZ monthly air temperature anomaly 1908-2026



Source: Berkeley Earth database (www.berkeleyearth.org) 1908-1995
 VDZA2 1996 – 2018
 VMT 2019 - present

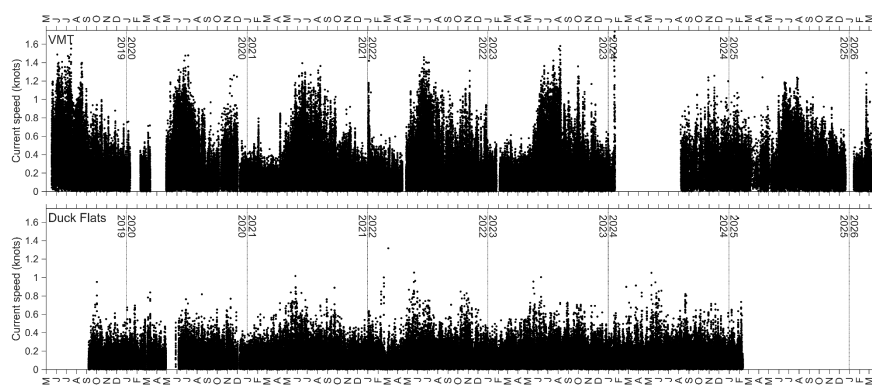
10

Buoy air temperature anomalies 2019-2026



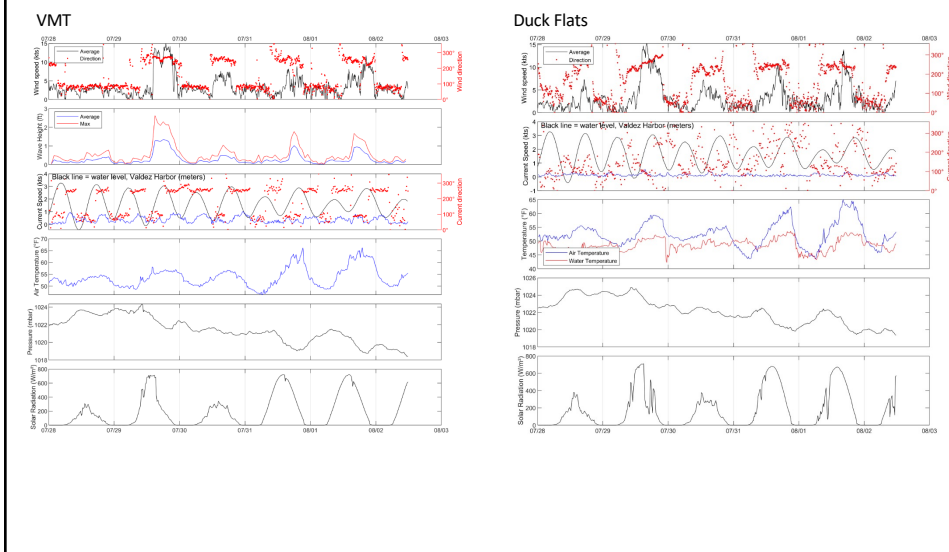
11

Surface currents



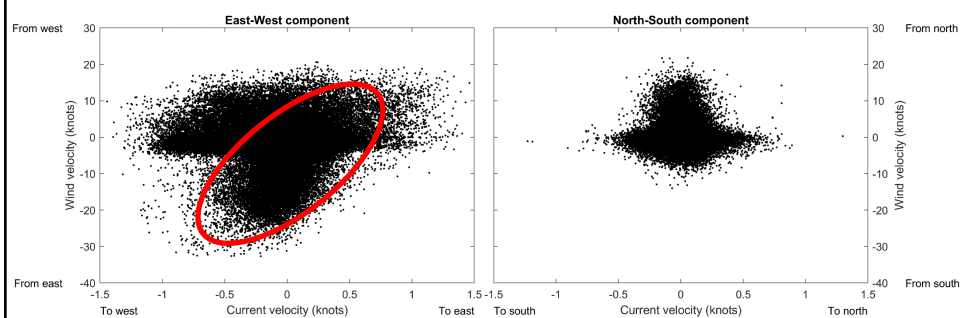
12

Tidal currents



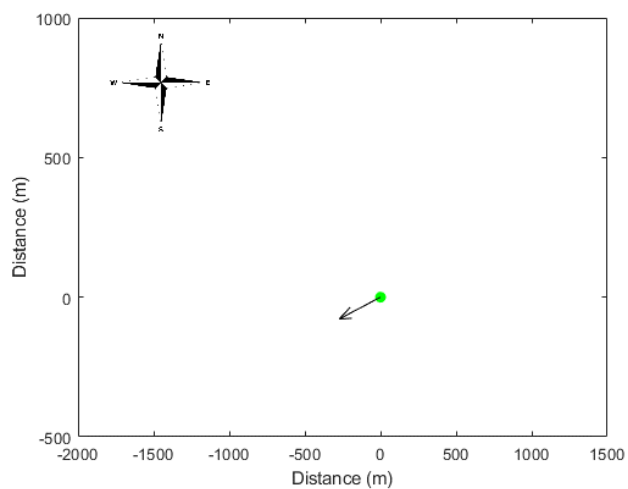
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Currents & Wind

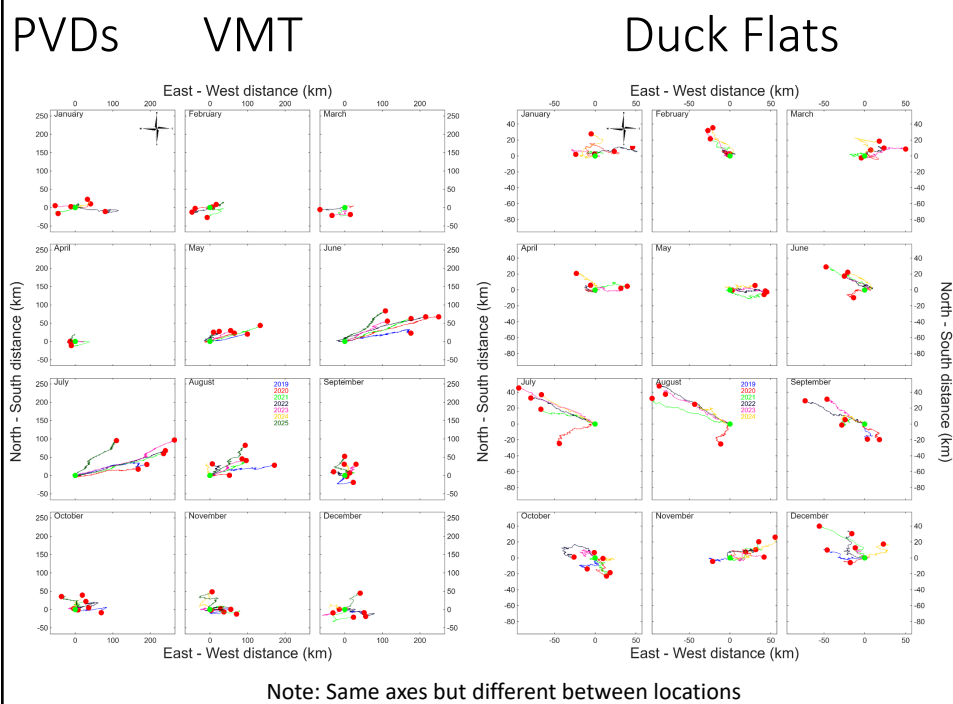


14

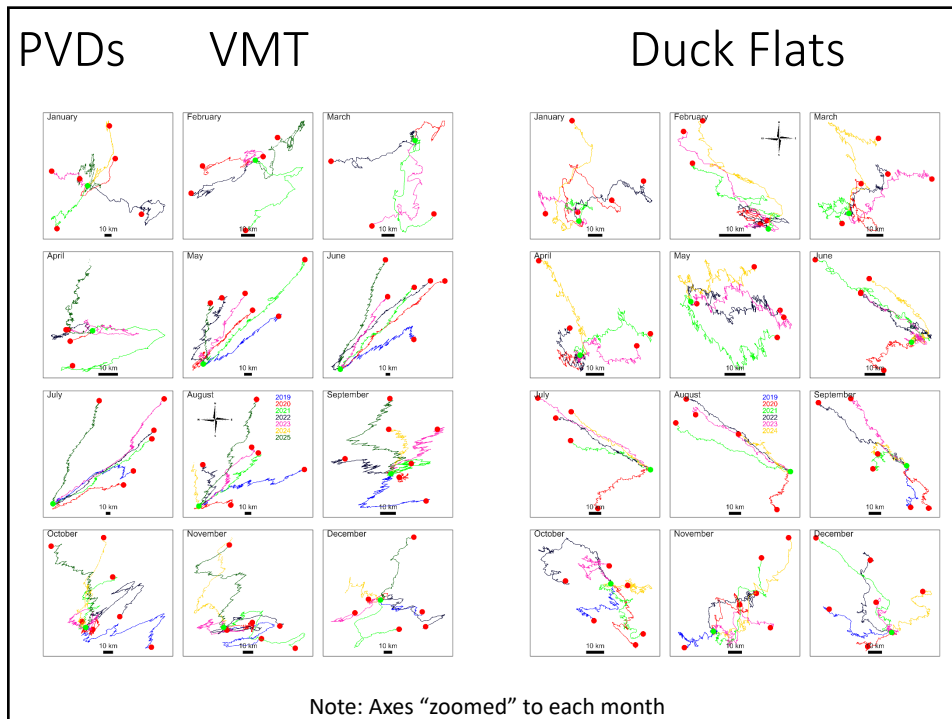
Progressive Vector Diagrams



15



16



17

Conclusions

- Air and water temperatures, and solar radiation followed a seasonal sinusoid with maxima in August and minima in February. Relative humidity was high at both sites and followed the seasonal temperature pattern.
- Air pressure was driven by large-scale atmospheric circulations.
- Winds were mostly from the east in autumn and winter, with maximum gust on order of 25 knots, and transitioned to weak easterly and stronger westerly sea breezes during the summer months.
- Wave directions tended to match wind directions. The highest waves were observed during autumn/winter storms and were of considerable size, just under 9 feet tall; spring/summer sea breeze generated waves were 1-3 feet.
- The temperature climatology persistent warming pattern over the past 115 years. Recently winters have been warmer than average while summers have been cooler than average.
- Surface currents in Port Valdez are complex and result from the interplay of winds, tides, and freshwater inputs. At the VMT, surface currents were northeasterly during summer sea breezes, and were northwesterly at the Duck flats. Tidal oscillations were visible during calmer periods, and surface current directions were variable during autumn and winter.

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Thanks!

