Salish Sea Ecosystem Conference

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Salish Sea ORCA buoy observations over the last decade: warmer and saltier than normal anomalies and their persistence

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Salish Sea ORCA buoy observations over the last decade:
Warmer and saltier than normal anomalies and their persistence

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- Six ORCA (Oceanic Remote Chemical Analyzer) profiling buoys take frequent (1-4x/day) measurements of water properties over the water column in Puget Sound, and have been operating for over 10-15 years, depending on location.
- To investigate the effects of marine heat waves and summer droughts over the last decade, anomalies were calculated from the long-term climatology to see times of higher than normal sea temperatures, possibly from marine heat waves (red), and times of higher than normal salinities (red), possibly from summer droughts.

Saline anomalies lasting longer?
Positive saline anomalies were evident during summer and early fall in 2014-16 in all basins, were absent during 2017, but since then (2018-21) have expanded to much more of the year. As exemplified by Twanoh and Carr Inlet data:

Some consistent temperature patterns:
All basins showed positive temperature anomalies year-round in 2015 and 2016, abating in 2017 and reprising in 2019, as exemplified by Twanoh and Carr Inlet 2015-16 data:

Some disparate temperature patterns:
Onset of anomalies, and seasonal patterns sometimes differ among basins. Full water column positive anomalies started in 2014 in Carr Inlet, but not until 2015 at Twanoh; seasonal anomaly patterns were somewhat opposite in these basins during 2017:

Upshot: Biology will be subject to different conditions, at times, among the basins, but in all, positive temperature anomalies are more common in last decade. In the last six years, only 2020 and 2017 did not have predominantly warmer than average seawater temperatures. Higher than average salinities during summer have been noted for all years since 2014, except 2017.

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