Salish Sea model ecosystem - lower trophic: episodic nutrient supply in the northern Strait of Georgia

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Salish Sea Model Ecosystem - Lower Trophic: Episodic nutrient supply in the Northern Strait of Georgia

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Outline

• Background: **Salish Model Ecosystem - Lower Trophic**
• Evaluation: Nitrate in the Northern Strait of Georgia
• Nitrate Supply Events
• Conclusions
Background: **Salish Model Ecosystem - Lower Trophic**

**SalishSeaCast** Physical Model  
(Soontiens et al, 2015)

- NEMO (Madec et al 2012) v3.6 primitive equation, baroclinic model
- GLS vertical turbulence in k-ε regime
- 398 x 898 x 40 grid
  - ~500 m horizontal, 1-20 m vertical
- forcing:
  - tides: 8 constituents
  - atmospheric: hourly 2.5 km resolution from Environment Canada
  - open boundary SSH (west)
  - rivers (150+): climatology except for Fraser measured at Hope
SMELT Biological Model – Based on 1-d SOG Model (Allen and Wolfe, 2013; Moore-Maley et al., 2016)

- nutrients, phytoplankton, zooplankton, detritus
  - *M. rubrum* is a mixotroph
- mesozooplankton closure based on climatology
- forcing: inputs of nutrients through rivers and at open boundaries (based on climatology), light
Background: **Salish Model Ecosystem - Lower Trophic**
Evaluation: Nitrate in the Northern Strait of Georgia

Nitrate from IOS Surveys: 2015-2016

Modelled (µM N) vs. Observed (µM N)

Sampling Dates

Jan 15, Apr 15, Jul 15, Oct 15, Jan 16, Apr 16, Jul 16, Oct 16
Evaluation: Nitrate in the Northern Strait of Georgia

Sentry Shoal Buoy data provided by Stephanie King and Katie Pocock
Nitrate Supply Events
Conclusions

• High nitrate surface waters pulse southward out of Discovery Passage into the Northern Strait of Georgia
• Intensity and southward extent of the surface pulse tends to be stronger during spring tides

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Thank you!