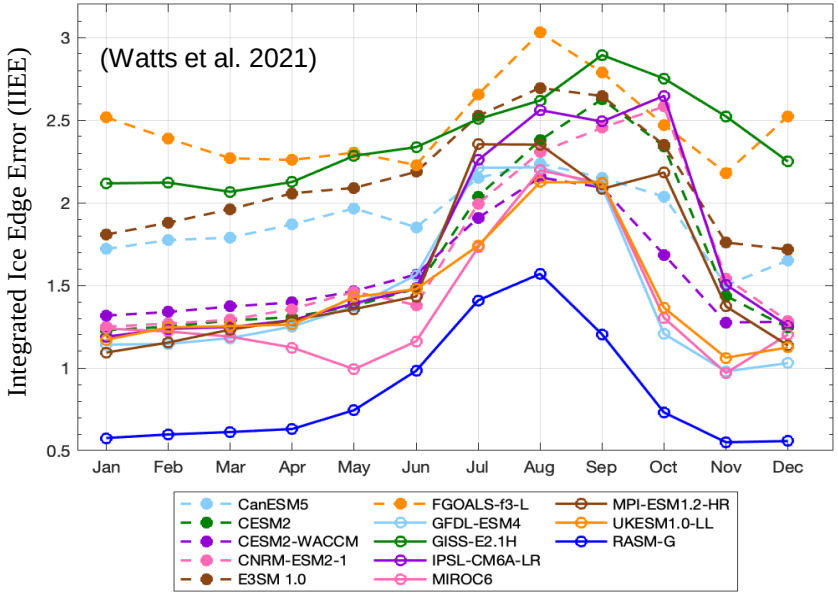
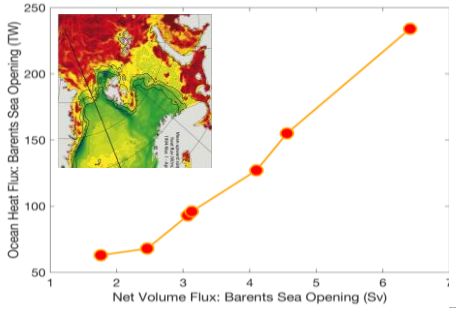
Importance of Local Processes and Feedbacks in Modeling a Changing Arctic Climate System

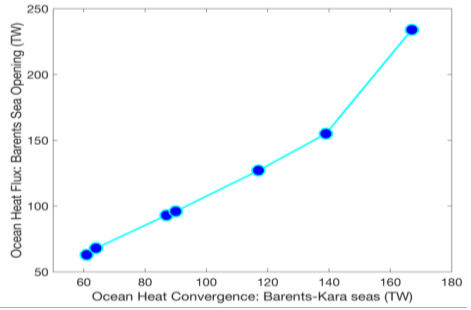
Wieslaw Maslowski, Naval Postgraduate School

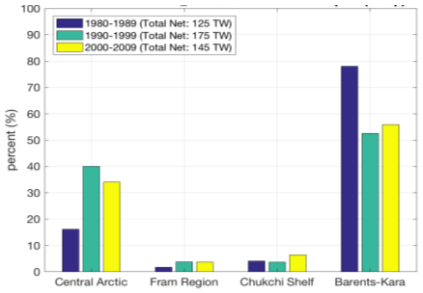
Continued limited CMIP model skill in representing the Arctic sea ice cover

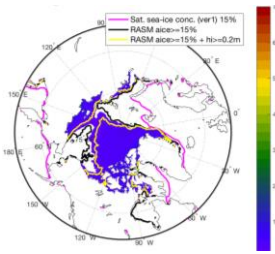


Relationships between the volume and heat fluxes at the Barents Sea Opening and the Barents Sea heat convergence









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Grand Challenge: **Oceanic Polar Heat Convergence**

Why:

- ❑ Forcing of sea ice downstream of warm water advection
- ❑ Impact of resulting surface turbulent heat fluxes on the atmospheric circulation
- ❑ Contribution to Arctic Amplification and Arctic-Midlatitude teleconnections
- ❑ Impact on Atlantic Meridional Overturning Circulation

How:

- Global eddy-resolving fully coupled Earth System Models
- Vertical discretizations with improved vertical mixing schemes
- Land hydrology – ocean coupling / estuary and coastal dynamics
- Sea ice rheology for high spatial resolution / shallow seas
- Expanded observations for constraining models