Sea Ice – Ocean Modeling:

1. High resolution
2. Floe size distribution

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J. Zhang modeling taxonomy:
PIOMAS, BESTMAS, BIOMAS, MIZMAS, HIOMAS

MAS = Modeling & Assimilation System

PIO = Parallel Ice-Ocean (N. Pole in Greenland)
BEST = Bering Ecosystem Study (N. Pole in AK)
BIO = Biology/Ice/Ocean (AK)
MIZ = Marginal Ice Zone (AK)
HIO = High Resolution Ice/Ocean (AK)
A consistent ice volume time series from **PIOMAS**

**Trend:** \(-3.1 \pm 1.0 \times 10^3 \text{ km}^3/\text{decade}\)
Sea Ice – Ocean Modeling:

1. High resolution

HIOMAS
= High resolution Ice/Ocean Modeling & Assimilation System
(2 km)

Dept of Homeland Security (DHS)
Arctic Domain Awareness Center (Anchorage, AK)
How do models simulate sea ice floe geometry?

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Floe diameter in MIZMAS

March 2014

June 2014

September 2014

Mean Floe Diameter (km) = \( \int g(l) l dl \)

12 sizes

10 cm \( \Rightarrow \) 3 km
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10 cm \rightarrow 3 km

- Zhang et al. (JGR, 2015): theory
- Zhang et al. (Elementa, 2016): first pan-arctic simulations
- Stern et al. (Elementa, in review, 2017): floe diameter obs from MODIS, SAR, hi-res visible
- Future: More model-obs studies, impact on ocean properties, bio ??

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