

Observations of sea ice thickness variability from space



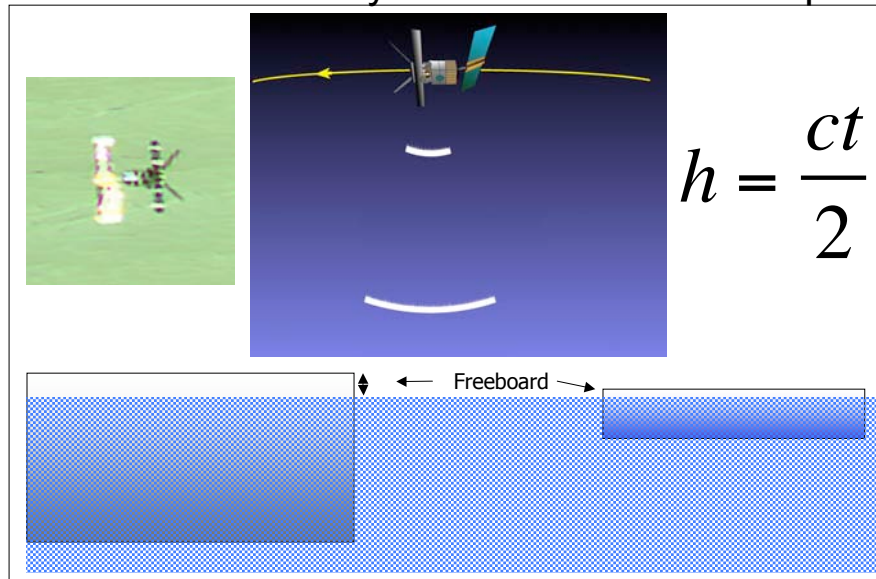
Seymour Laxon
Centre for Polar Climate and Modelling,
University College London



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Centre for Polar Observation and Modelling



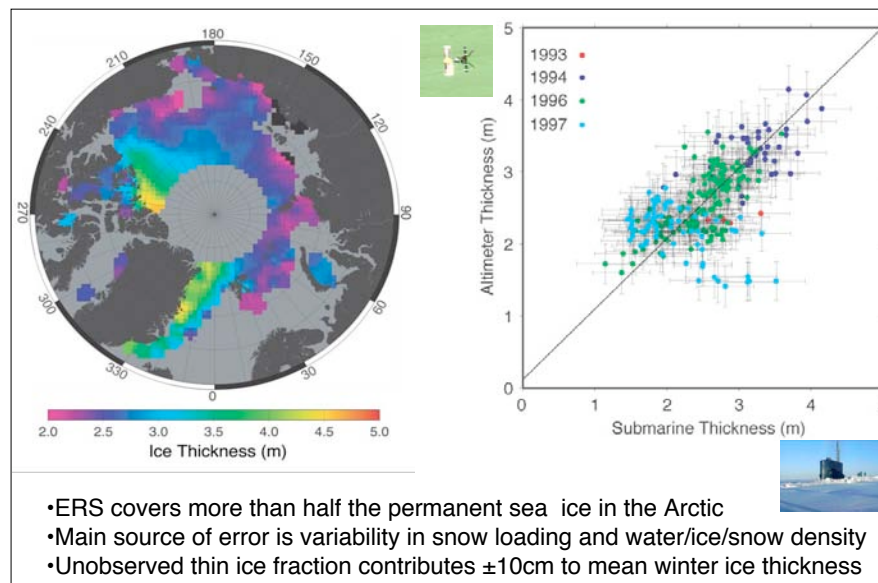
Satellite Altimetry - Measurement Principle



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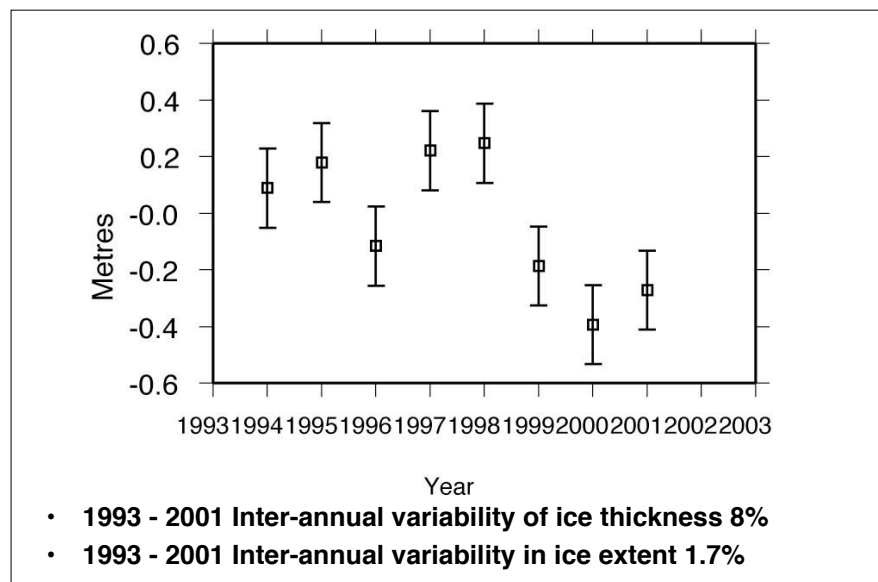
Ice Thickness estimates from ERS1/2 Satellite Radar Altimeters



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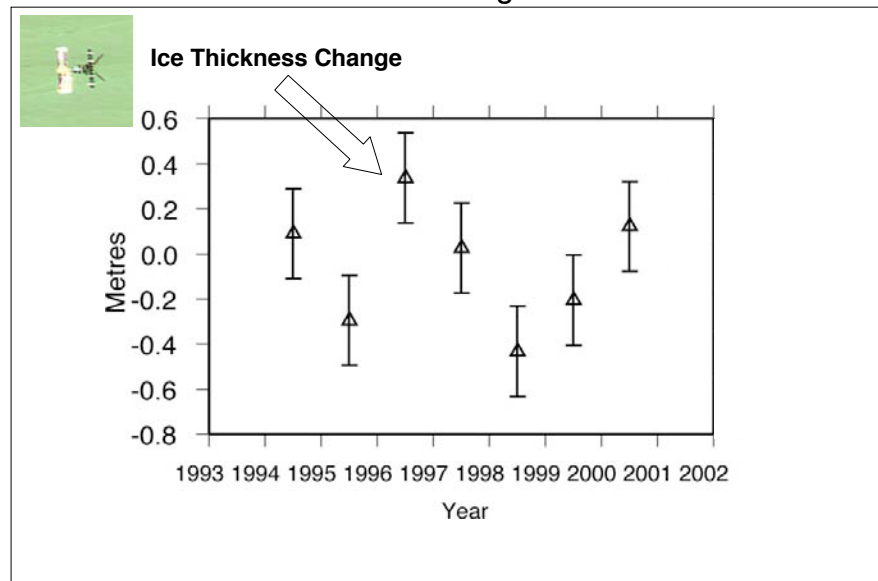
Anomalies in Winter Ice Thickness



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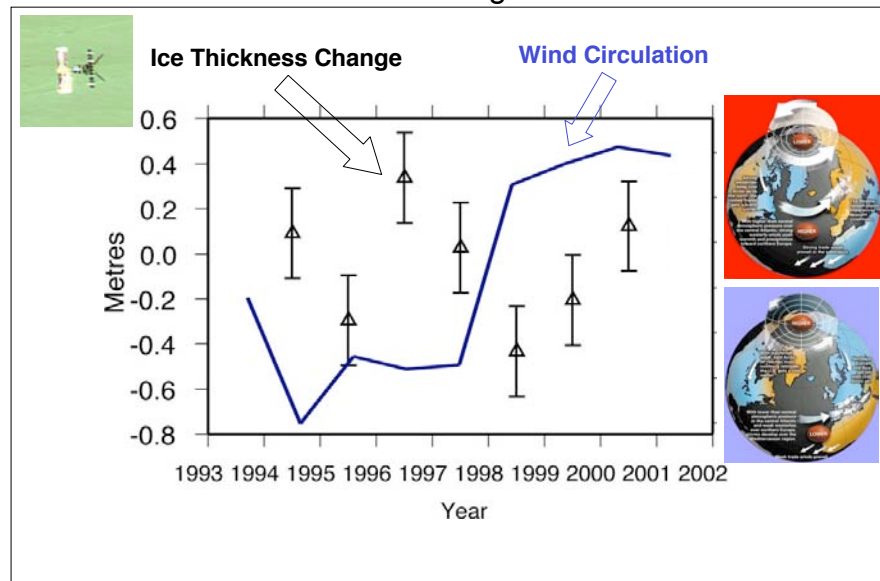
Control of Ice thickness Change ?



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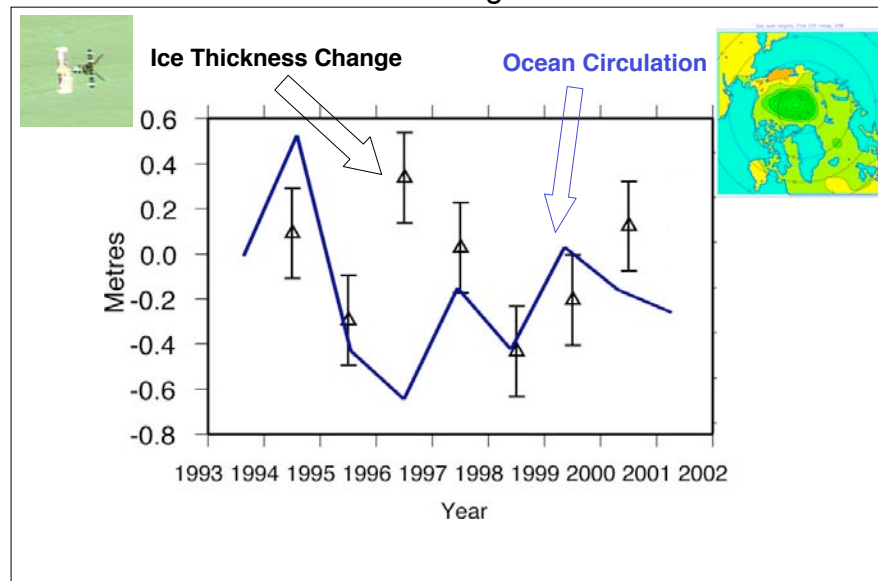
Control of Ice thickness Change - Arctic Oscillation



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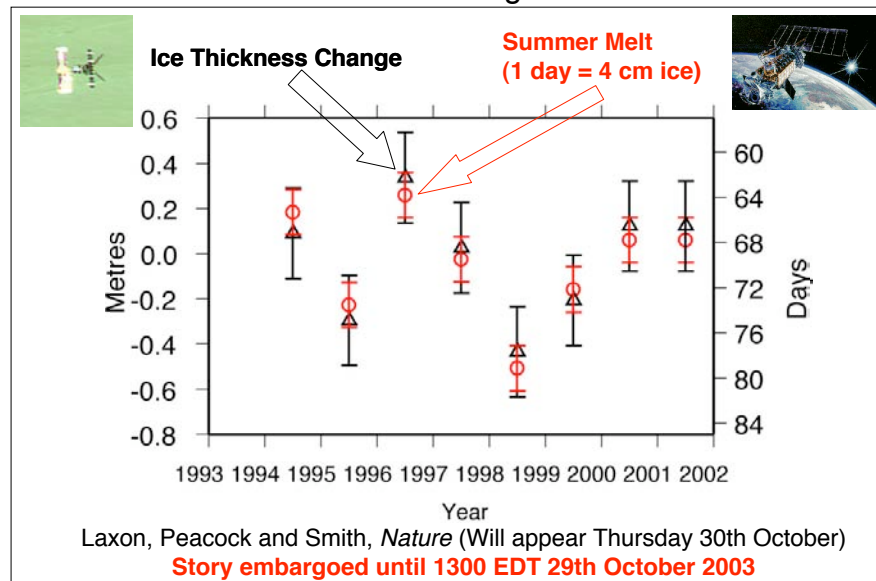
Control of Ice thickness Change - Arctic Ocean Oscillation



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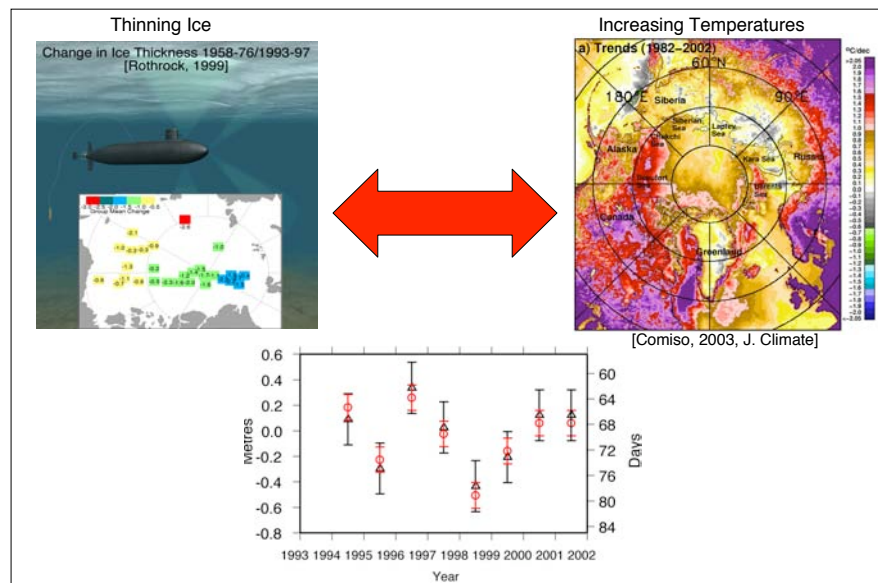


Control of Ice Thickness Change - Summer Melt



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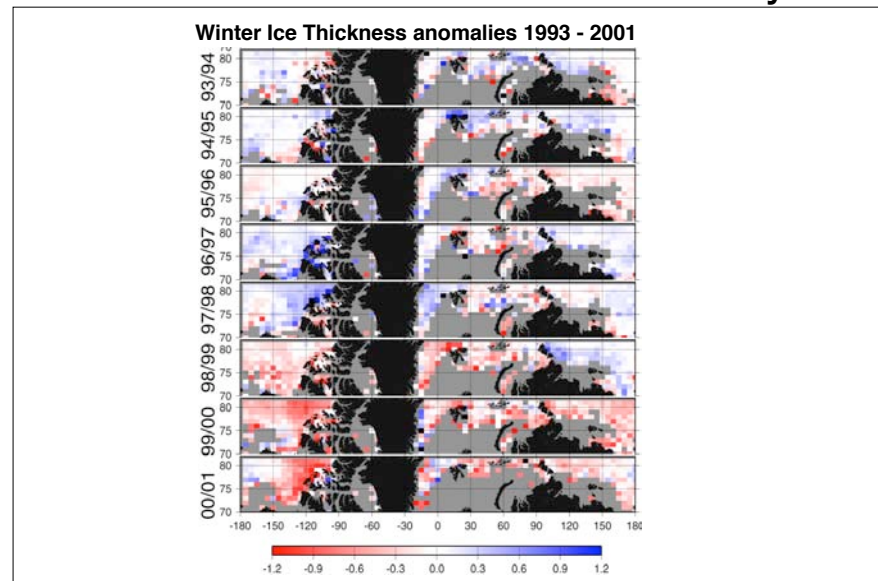




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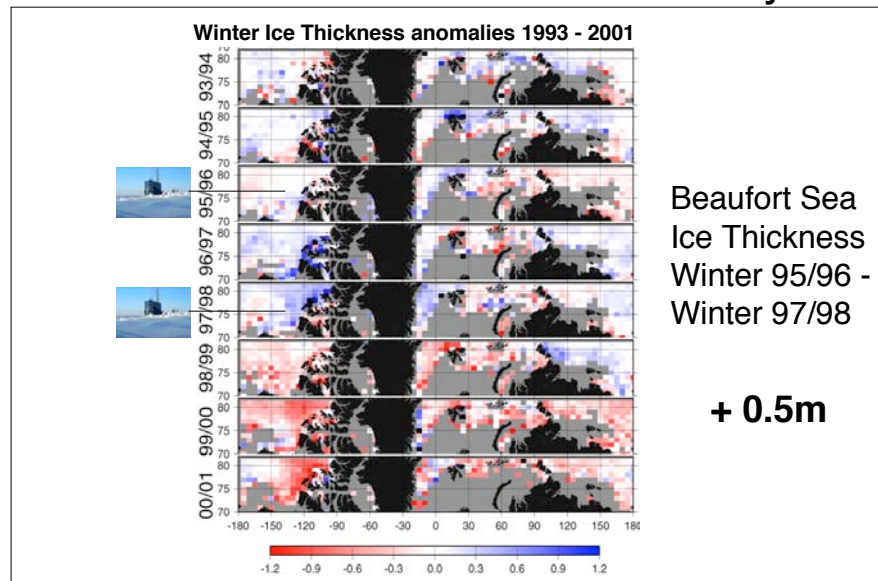
Thickness trends and variability



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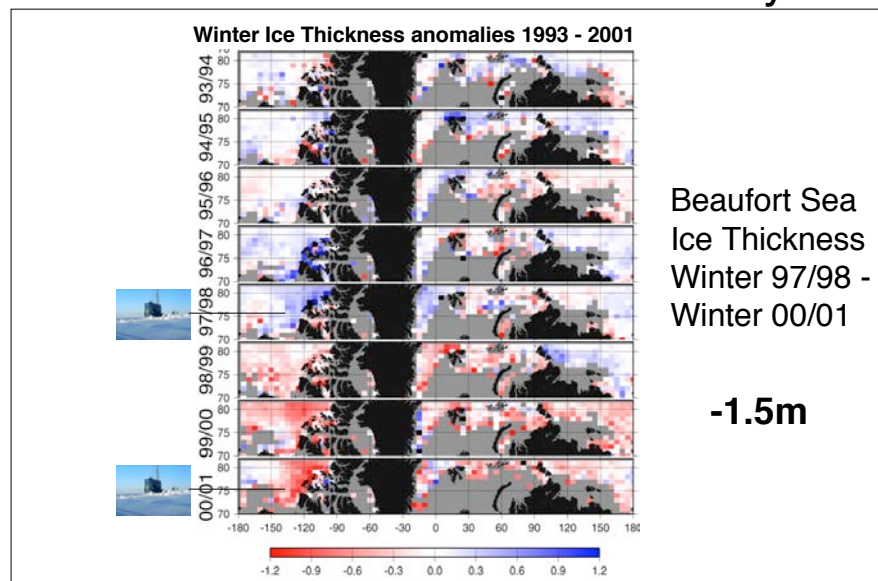
Thickness trends and variability



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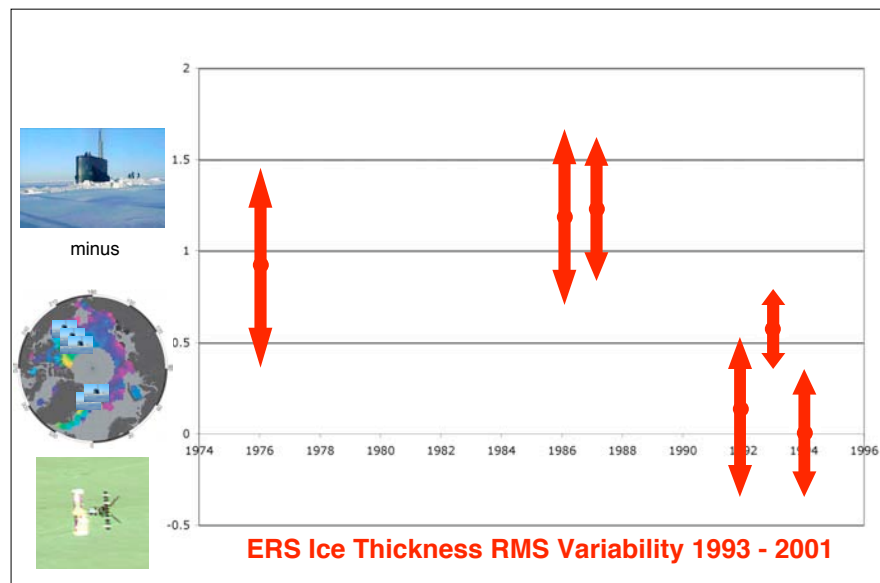


Thickness trends and variability



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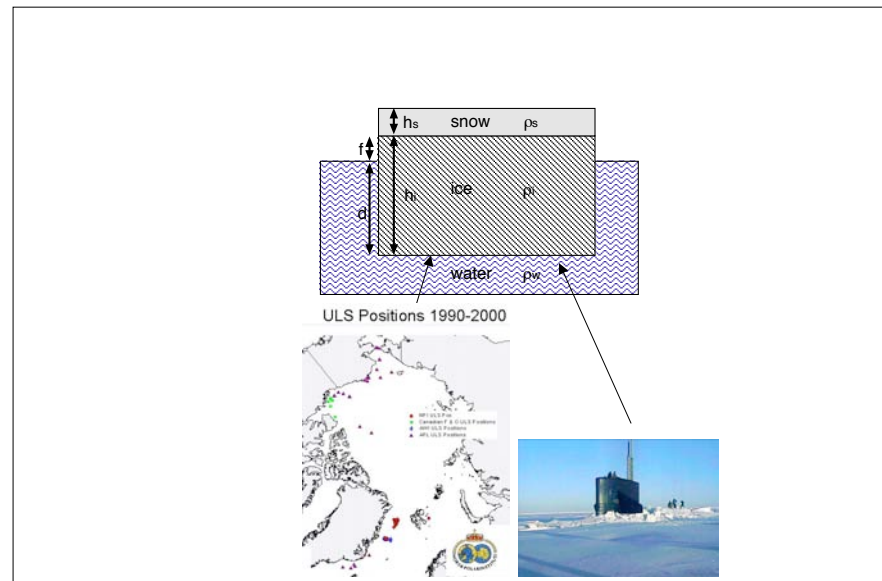




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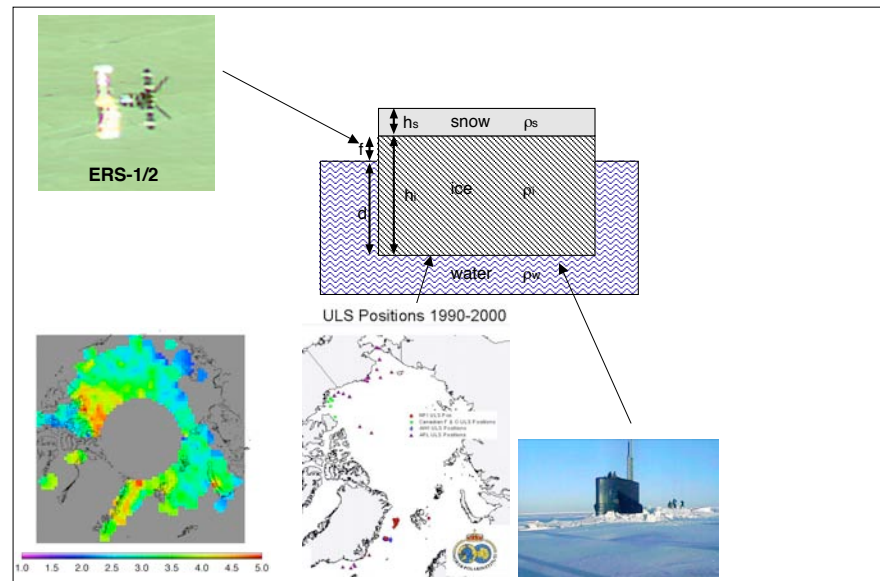
Ice Thickness - The Future



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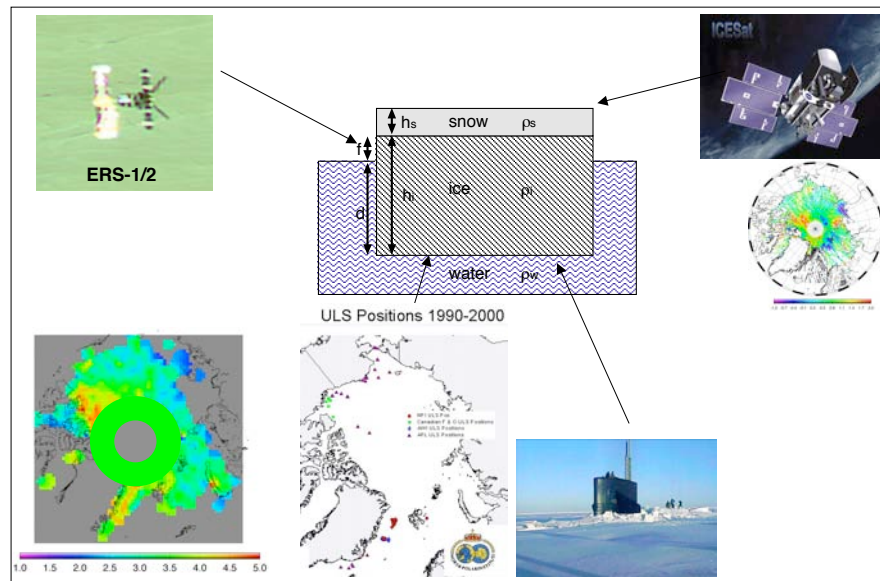
Ice Thickness - The Future



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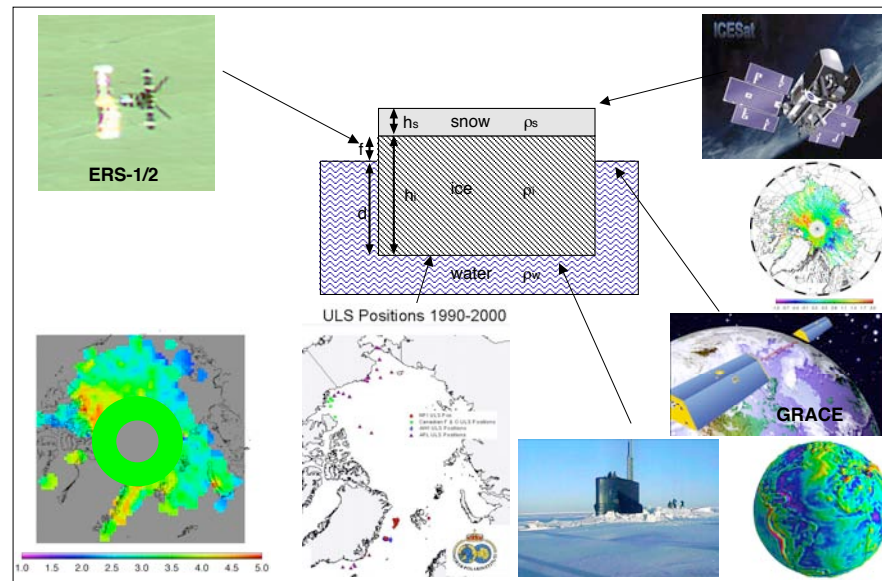
Ice Thickness - The Future



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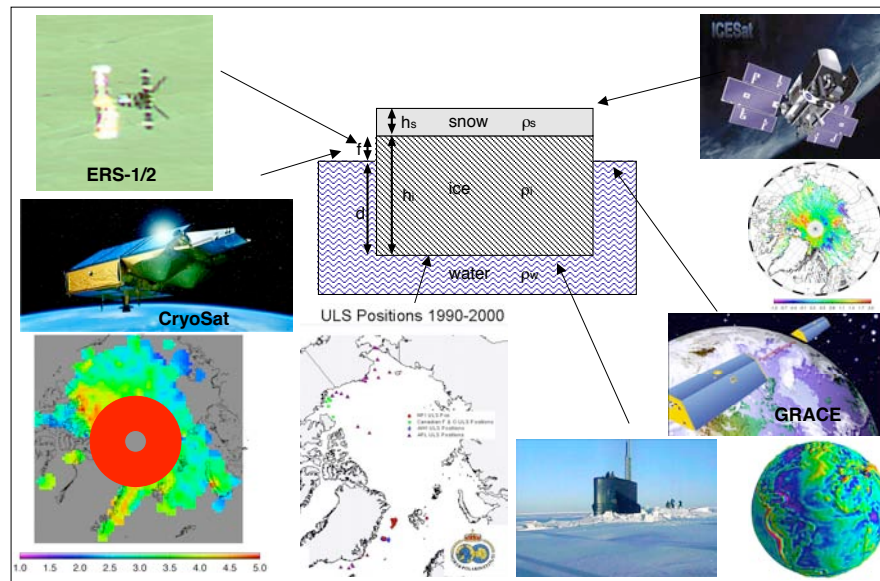
Ice Thickness - The Future



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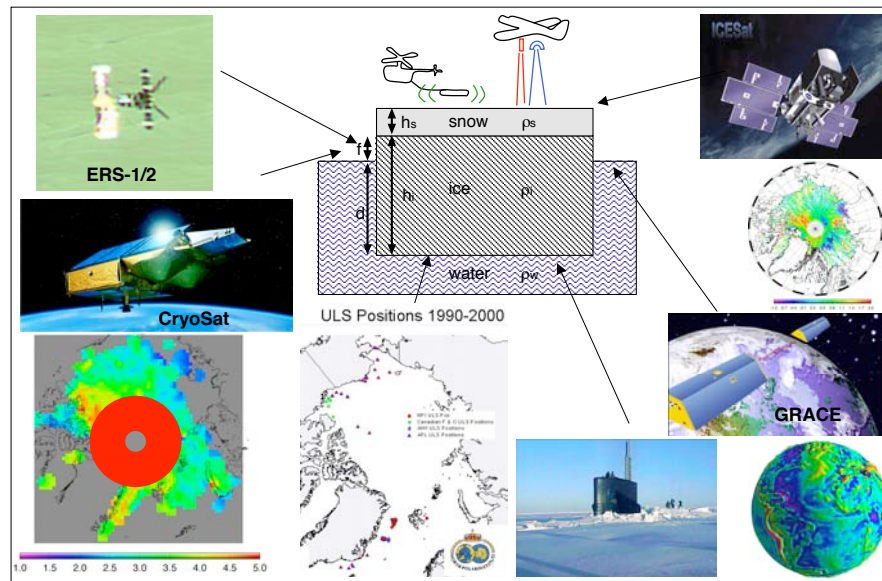
Ice Thickness - The Future



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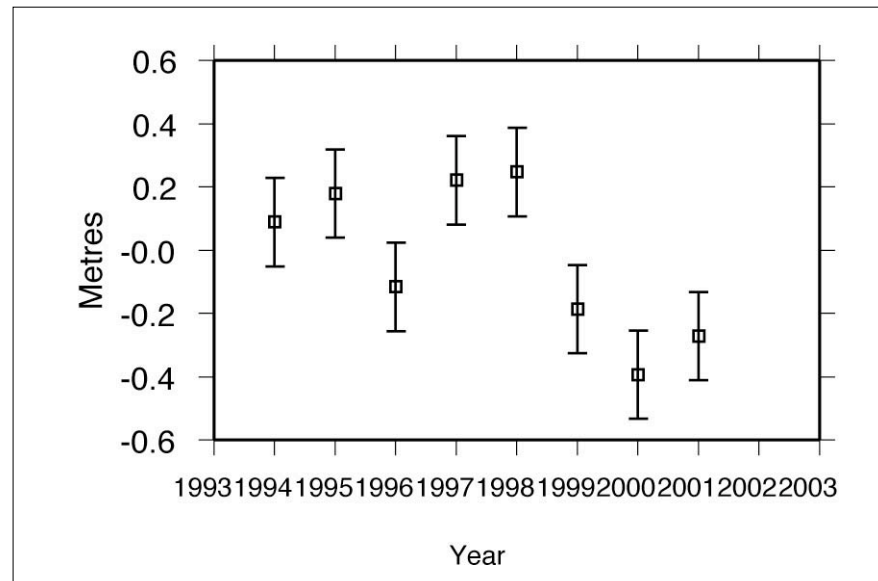
Ice Thickness - The Future



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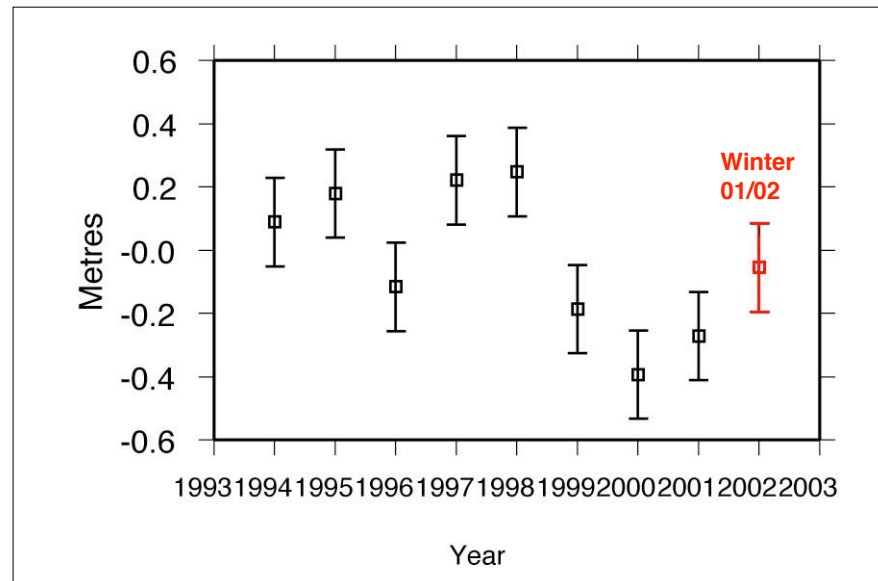
Arctic sea ice thickness time-series



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Arctic sea ice thickness time-series



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Observations of sea ice thickness variability from Space

Summary

- ERS Satellite radar altimetry has provided the first continuous time-series of Arctic ice thickness
- Year on Year ice thickness change is dominated by melt season length
- Satellite observed thickness variability supports the view that the 1990's thinning is a decadal phenomenon
- Thinning continued through the end of the 1990's but may now be recovering
- New geodetic and altimetric missions will add greatly to our knowledge of ice thickness in the near future
- The acquisition and timely release of ice draft data from moored and submarine upward looking sonar will be critical for validation of space estimates
- Our best chance of understanding both past and future changes in ice thickness will be achieved by combining both in-situ and space-borne estimates of thickness



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