climate change initiative

sea ice age and drift (SAGE)

SAGE - Sea Ice Age and Drift (2025-2028)

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sea ice age and drift

Sea Ice Age - a product in the SEA ICE ECV

ESA CCI/CCI+ since 2010

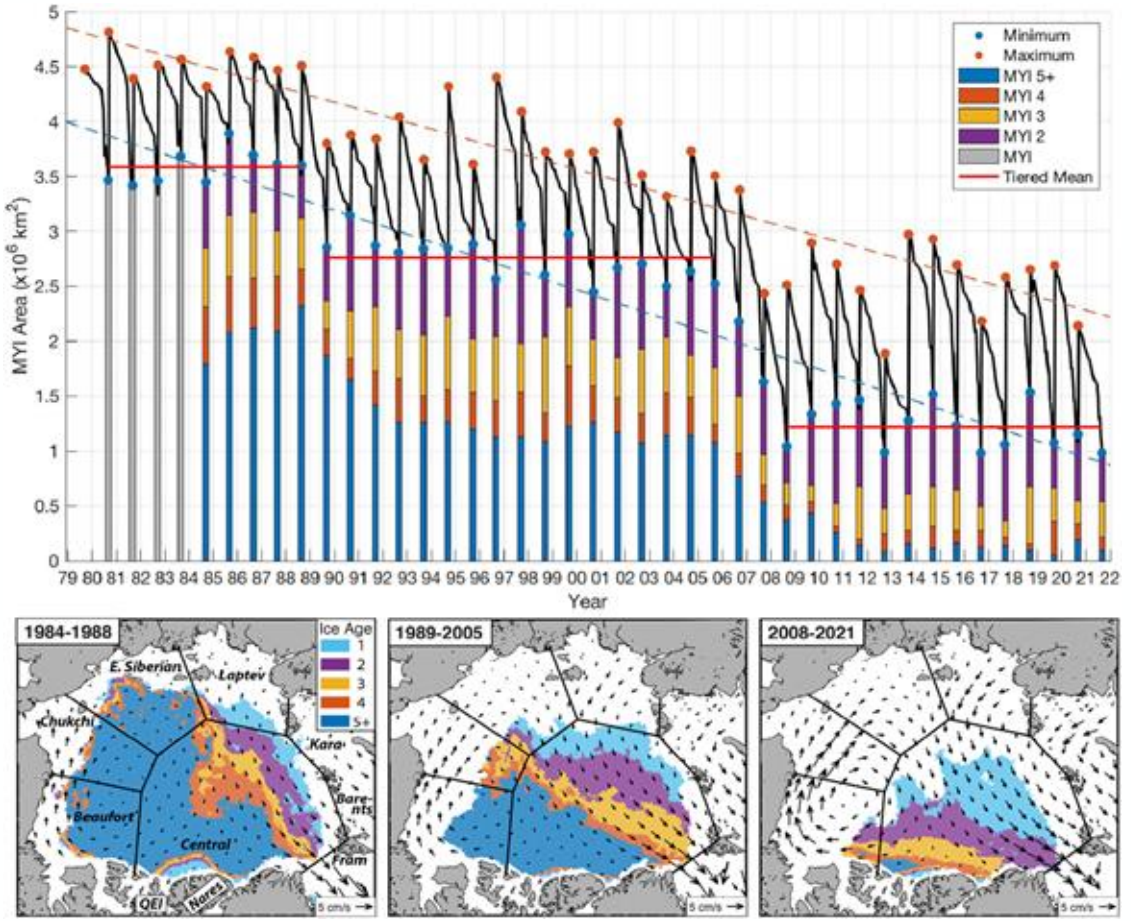
1. Sea-ice concentration & extent, area
2. Sea-ice thickness
3. Sea-ice drift (since 2014-2018)

   → *CCI option "Sea-ice age"*

GCOS (2022):

4. Age
5. Albedo
6. Temperature
7. Snow depth

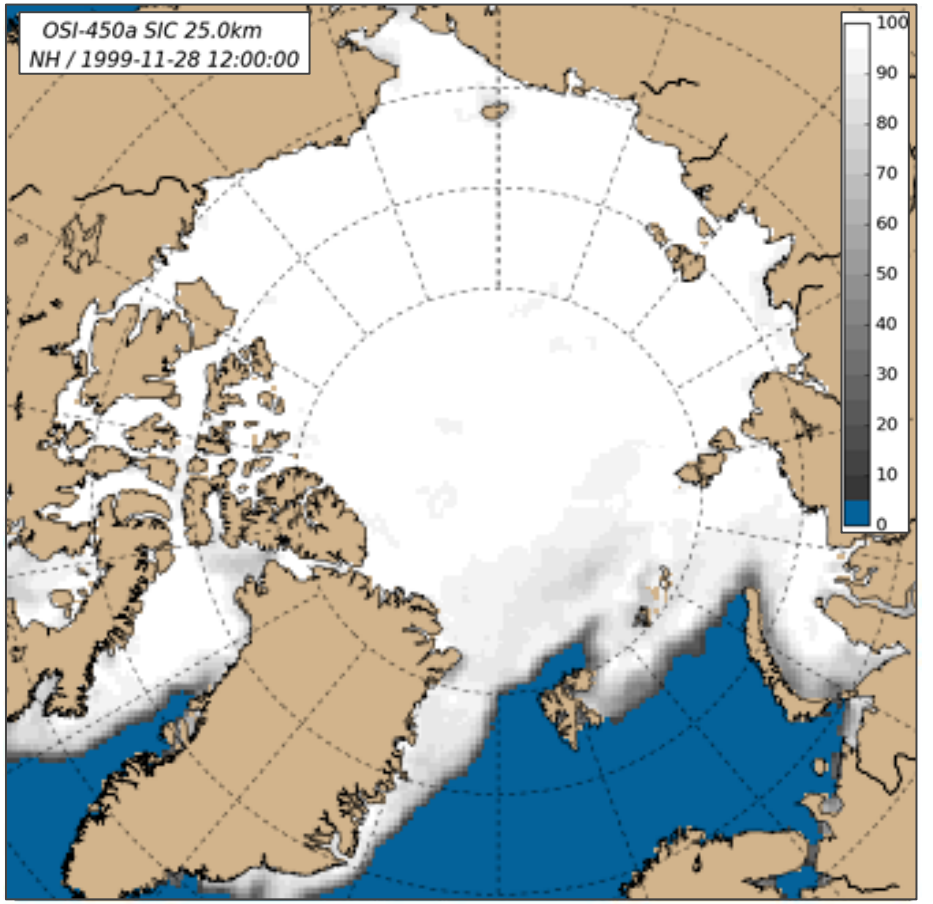
Stepwise Reduction of Arctic Multiyear Area (NSIDC)



Babb et al. (2023). JGR. DOI:10.1029/2023JC020157

Sea Ice Age - Why important ECV product?

- Sea-ice age and drift - more than a snapshot. Integrate both dynamic and thermodynamic history.
- Sea ice age - a strong proxy for several key physical properties that influence ice-ocean-atmosphere interactions.
- Sea ice age - an indicator of resilience.

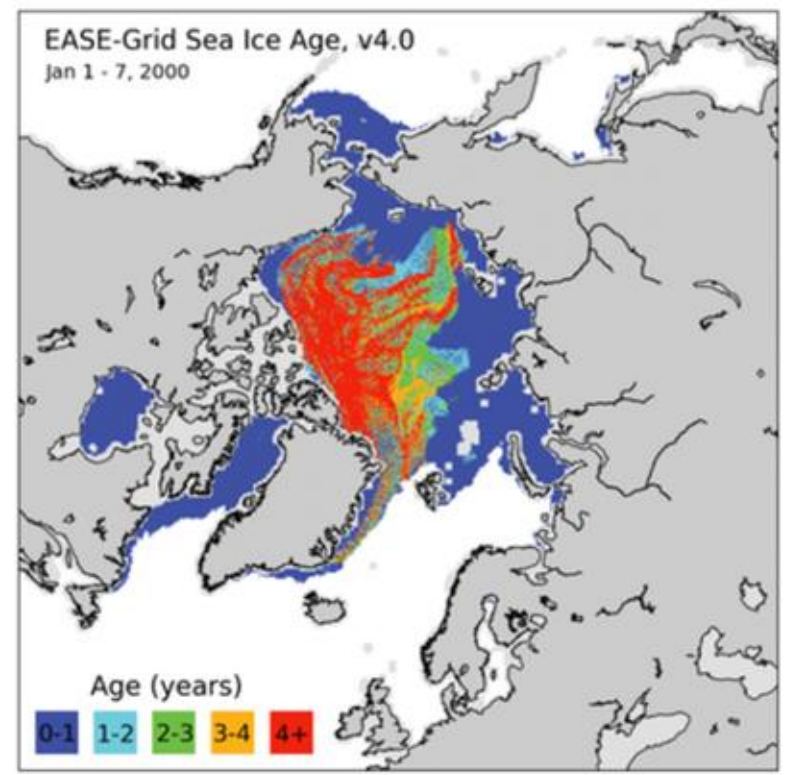


Approach & Methodology

Traditional methods

Tracking ice.

Based on other ice products.



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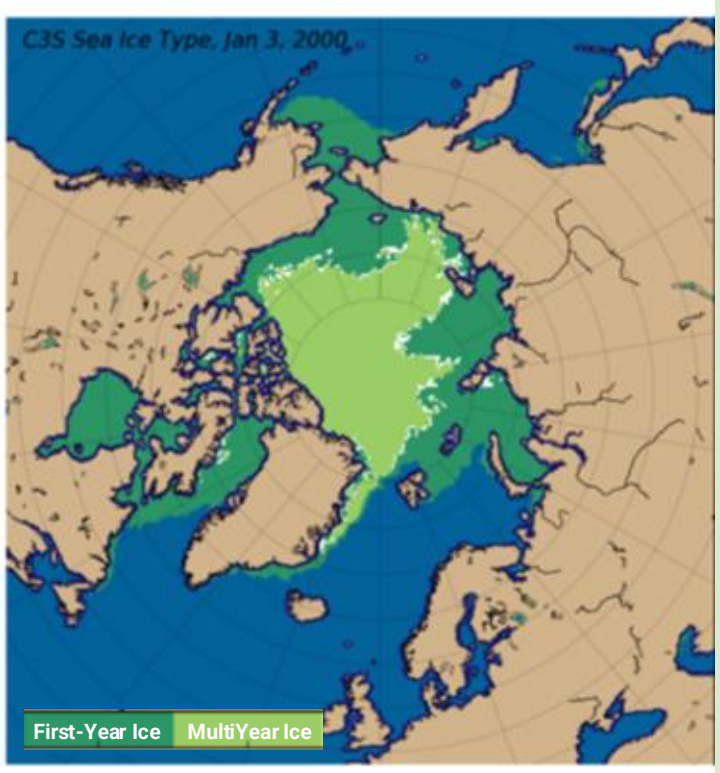


Direct interpretation.

Based on PMW and SCAT data.

Planned work in SAGE

Better understand traditional methods →

Build blended algorithm

Sensors to be used:

Focus on Passive Microwave → longest time period

+ Scatterometer - *if* added value(?)

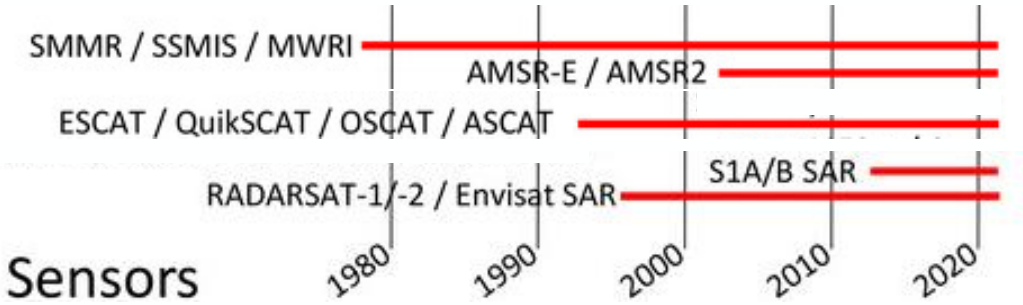
Dependency on sea-ice drift data

1) Tracking approach depends on this

2) Microwave-interpretation strongly improves on it

→ SAGE task to backextend existing ice-drift CDR

Northern hemisphere + southern hemisphere coverage



(Lavergne, Kern et al. (2022), BAMS)

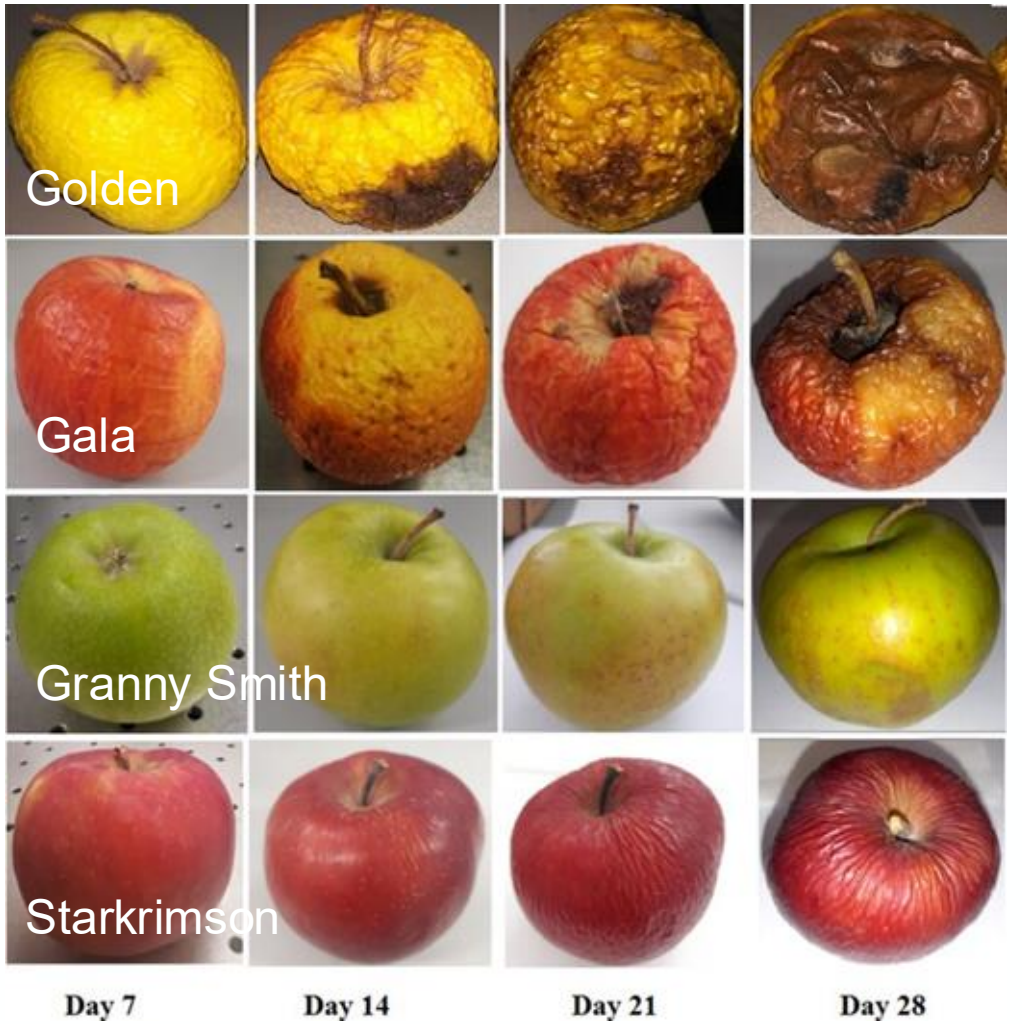
Fun and important challenges - what is sea-ice age?

Age→**Time Since Formation**

- Directly the duration since ice formation [days]

Age→**Apparent Age**

- Nr of survived summer melt season [season]



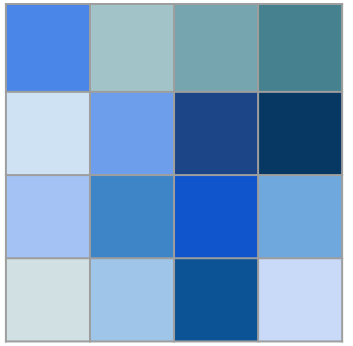
(Bratu et al. (2021), Scientific Reports)

Sea ice age - what is measured

Several ice **age classes co-exists** in an area

Horisontal:
gradual freezing, new ice forms in between older floes
ice drift, divergence

Vertical:
New ice forms under older ice, snow-ice forms above



Are you ready to discover more?

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