Re-thickening Arctic Sea Ice

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Project Timeline

- Obtain permits and local support (M6)
- Initial reports (M12)
- Design and testing of underwater drone + potential barrier assessment (M18)
- Reports on modelling (M24)
- Reports on target areas + successful design of hub and spoke model (M36)
- Final project report (M42)

Programme Alignment

The Arctic is currently warming 3-4 times faster than the global average. While rapidly decarbonizing the global economy is crucial, implementing methods to specifically cool the Arctic region could significantly extend the time needed to avoid temperature-induced climate tipping points. To explore the feasibility of purposefully cooling the Arctic, we will investigate whether sea ice re-thickening could offer a viable solution.

Summary

- Our aim is to develop the essential knowledge, technology and impact assessments required for sea ice thickening to mitigate significant loss of sea ice in the Arctic Ocean.
- We will integrate large-scale climate and sea ice **modelling** supported by **field and laboratory tests** in collaboration with local communities to assess:
  a) Large-scale **Regional Application of Arctic Ice Thickening.**
  b) A targeted approach, involving **Ice Arch Strengthening**, to limit the export of Arctic sea ice.
- Alongside each of these approaches, we will also address the scalability of developed technologies.

Aims & Objectives

Regional Application of Arctic Ice Thickening

- Build upon previous research by testing + validating effectiveness of strategies
- Feedback and inform modelling to enhance accuracy + certainty of parameters

Ice Arch Strengthening

- Explore targeted use of ice re-thickening to strengthen certain ice arches, to limit export + loss of sea ice

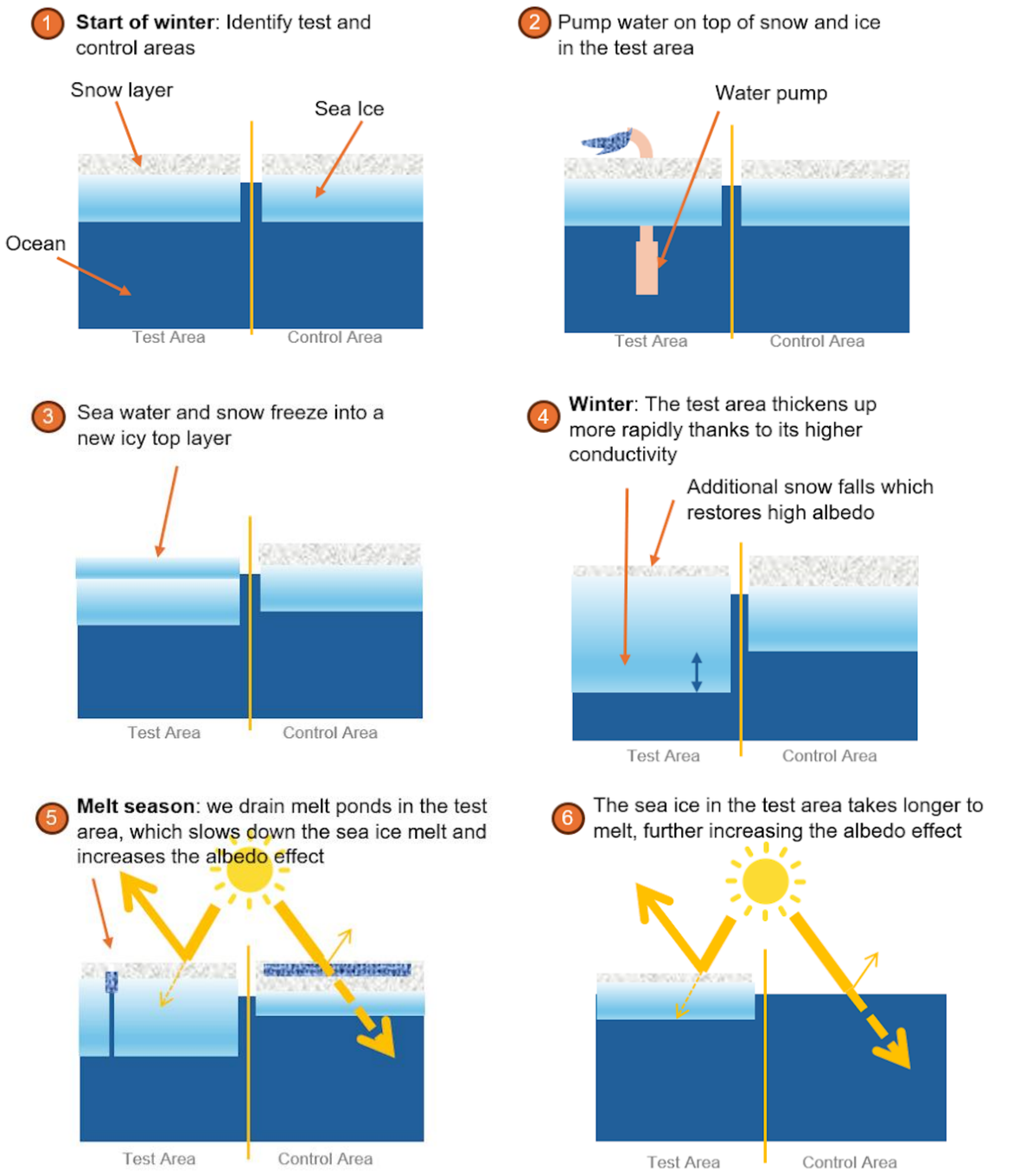
Scalability studies

- Explore use of underwater drones for distribution of solution under ice and of movable pumping platforms on top of ice using high flow rate pumps

Milestones

- Recruitment + start up
- Permits + local support obtained for each location, 2025/26 winter
- Initial report: sea ice characteristics
- Initial report: modelling of regional- + basin-scale
- Design, delivery + testing of underwater drone
- Interim report: barriers
- Interim report: evaluation of modelling ice flow through Nares Strait
- Report: target areas
- Final report: regional- + basin-scale ice thickening
- Design, manufacturing + operational test in Arctic conditions of hub + spoke model, with feasibility study
- Final project report

Ice thickening: field test phases



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