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Arctic sea ice volume changes and its consequences

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Satellite measurements of Arctic sea ice freeboard and observations of other sea ice properties related to sea ice thickness indicate a sizable loss of sea ice volume in the Arctic Ocean in recent years. What are the causes for these losses and how is the sea ice volume decline related to long-term changes in the Arctic? What consequences for sea ice extent, Arctic Ocean circulation and fresh water balance, and atmospheric circulation are to be expected from the changes in sea ice volume? To address these questions we shall present regional ocean-sea ice hindcasts over the last 110 years as well as global coupled climate model results and analyze them regarding long term changes in sea ice volume and their relationship with the atmospheric and oceanic forcing.