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Regional features and the late 1990s change in the Northern Hemisphere sea ice trends

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Present study investigated changes in the late 1990s in the Northern Hemisphere sea ice trend and impacts of several factors. While the sea ice extent for the whole Northern Hemisphere in March displays a steady downward trend during 1979-2014, pronounced regional differences are identified in the sea ice trend and its change in the late 1990s, including an enhanced downward trend in the Barents Sea, an increase in the upward trend in the Bering Sea, and a weakening of the upward trend in the Gulf of St. Lawrence. The trends and their changes in sea ice in both March and September are consistent with those in concurrent and/or preceding surface air temperature. Atmospheric wind trends and their changes in March and September contribute to surface air temperature trends and their changes in many regions. In March, the northerly trend over the Bering Sea accounts for the surface air cooling trend and the southerly trend over the Okhotsk Sea and the Kara Sea explains the surface air warming trend. In September, the anticyclonic trend over the eastern Arctic region and the southerly trend over the Barents-Kara Seas after the late 1990s enhance the surface air warming trend in these regions, which is consistent with the accelerated decline of the Arctic sea ice in September after the late 1990s. A reduction in multi-year sea ice induced by warming in previous seasons and a positive ice-albedo feedback in summer contribute to the accelerated Arctic sea ice decrease in September after the late 1990s.

Biography

Renguang Wu obtained his PhD in 1999 from University of Hawaii at Manoa, USA. He worked as a Research Scientist at Center for Ocean-Land-Atmosphere Studies, USA. He was a Professor in the Chinese University of Hong Kong, Hong Kong. He has published more than 130 papers in referred journals and had served as an Editor of Journal of Climate.

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