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Climate Change Associated with Global Teleconnections, Volcanic Eruptions, and the Arctic ' s Snow-Ice Albedo in Godthab, Greenland

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ABSTRACT

To study the impact of climate change on Godthab(Greenland), temperature and precipitation gathered from the Global Historical Climatology Network (GHCN) were analyzed for patterns within 1866-2011. Both temperature and precipitation have experienced an overall increase throughout the past 146 years. Precipitation, however, has experienced a declining trend since 1985. North Atlantic Oscillation (NAO) and Arctic Oscillation (AO) indices showed strong correlations with average annual temperature (R = ?0.6) and smaller correlations with annual total precipitation (R = ?0.2). There are moderate correlations between temperature, precipitation, and Southern-Oscillation Index (SOI). The positive phases of Pacific-North American (PNA) led to increased winter and spring precipitation. The climate mode ' s influential strength on Godthab ' s temperature and precipitation, vary seasonally. In contrast with global average temperatures, Greenland has not experienced a continual warming trend since the 1950s; 30- and 10-year trends show a cooling period between 1965 and 1995. From 1866 to 2011, Godthab ' s average annual temperature has increased by 1.9?C, and is anticipated to continue to warm in accordance with the global warming trend and the Arctic ' s associated feedback mechanisms.

KEYWORDS

Godthab (Greenland); Climate Modes; Teleconnections; Climate Change; Climate Variability; ENSO; NAO; AO; PNA

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