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The Great Lakes Area Climate Change (Temperature and Precipitation) Forecast for the Year 2050: Based on PRECIS High Resolution RCM (25 Km x 25 Km) Analysis Results

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The Laurentian Great Lakes contains about one-fifth of the world's surface freshwater and eight-tenth of North America's. The climate changes of this area may affect water supply, tourism, shipping, fish resources and many other issues in North America. In this study, we applied a Regional Climate Model - PRECIS, which was developed at the Hadley Centre of Met Office of UK to generate a high resolution (25 km x 25 km) of future climate conditions for the Great Lakes basin. The PRECIS was validated by some observed climate data, while future climate conditions were projected based on the SRES_A1B Emissions Scenario. Our analysis shows that future (2050s) Great Lakes area temperature may increase 3.25 °C in winter and 2.87 °C in summer, respectively. For the 2050s, winter precipitation (snow) of upper and lower Great Lakes areas may, on average, increase 0.4 mm/day and 1.0 mm/day, respectively, and the 2050s summer precipitation of the upper and lower watersheds also may increase 0.2-0.3 mm/day and 0.7 mm/day, respectively. Our further research will utilize those climate change data predictions to study the impacts of climate changes on the Great Lakes fish habitats.