

The data provided here consists of 20th century hindcasts, and 21st century forecasts, from Atmospheric-Ocean General Circulation Model (AOGCM) simulations carried out for the 4th Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC). It is designed to be directly applicable towards projecting future Arctic-Yukon-Kuskokwim salmon runs but has been designed to also be a resource for western Alaskan climate interests in general.

There are six basic parameters catalogued here: sea ice extent, sea surface temperature (SST), surface air temperature (SAT), sea level pressure (SLP), surface wind, and precipitation. The 20th century hindcasts are for the interval of 1980-2000; the forecasts are for the interval of 2000-2100. The model output includes graphical representations of climatological decadal means and tabulated data in the form of monthly averages in ASCII format. The latter consists of separate files for individual GCM runs; the IPCC models included here are the ones previously shown by Wang and Overland (2009) to be able to replicate the observed seasonal cycle in Bering Sea ice cover. The parameters considered here are intended to represent the overall climate of the Bering Sea. In some cases, these parameters have been directly linked to the abundance or survival of individual salmon stocks (e.g., NRC 2005; Shotwell and Adkison 2004). Because the IPCC models are designed to provide climate information on broad spatial scales, here we provide area averages for the eastern Bering Sea (54-66 deg. N, 175-157 deg. W). These averages can be used to estimate changes in the regional climate over the course of the 21st century. Gridded data for the parameters considered here is available; requests can be directed to N. Bond (nicholas.bond@noaa.gov) or M. Wang (muyin.wang@noaa.gov).

There are a large number of groups using IPCC model results for regional applications. A variety of approaches are being employed, and the suitability of any particular approach depends on the situation. It is recommended that users of this data consider the issues that have emerged in previous studies, as discussed in the scientific literature. Specific examples of high-latitude and marine ecosystem applications involving the present investigators include Hollowed et al. (2009), Wang et al. (2010) and Overland et al. (2010). In general, ensemble-based methods are desirable in that they provide a means for reducing biases and estimating uncertainties.

References

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