SNAP Climate Projections: *tools for planners*

What are SNAP climate projections?

The Scenarios Network for Alaska Planning provides predictions of how average temperatures and precipitation may change in Alaska as a result of global climate change. Communities, businesses, and agencies work with SNAP to link these projections to ecological, social, and economic changes, and to plan for the future.

How are projections derived?

IPPC Global Climate Models

- The Intergovernmental Panel on Climate Change (IPCC) used fifteen different General Circulation Models (GCMs) when preparing its Fourth Assessment Report. Each model was created by a different nation or group using slightly different data and assumptions. Thus, models can be expected to perform with varying degrees of accuracy in any particular region. Accuracy can be checked by comparing model output for past years to actual climate data for the same time period.

Model Selection

- SNAP investigator Dr. John Walsh and colleagues analyzed how well each model predicted monthly mean values for three different climate variables (surface air temperature, precipitation, and sea level air pressure) over four overlapping northern regions (Alaska, Greenland, latitude 60-90˚N an latitude 20-90˚N) for the period from 1958–2000. They noted that models that performed well in one northern region tended to also perform well in others. SNAP climate models rely on output from the five models that provided the most accurate overall results.

Scaling down model results

- Results are scaled down to match local conditions using data from Alaskan weather stations and PRISM (Parameter-elevation Regressions on Independent Slopes Model), an analytical tool that uses point data, a digital elevation model, and other spatial data sets to generate gridded estimates of monthly, yearly, and event-based climatic parameters, such as precipitation, temperature, and dew point.

Presentation of data

Data can be accessed via our website (www.snap.uaf.edu) as ASCII files for GIS, or as GoogleEarth maps. Data include mean monthly temperatures and precipitation, as well as derived values such as decadal means, thaw dates and growing season length. Data for 353 communities statewide are also available, in tabular form.

Time periods

SNAP offers climate projections from the present to the year 2099. We also have historical data derived from Climate Research Units and downscaled using PRISM. Data from 1980 onwards is available on our website.

Scale and resolution

Climate projections have been scaled down to 2km resolution. Thus, each pixel in a climate map represents a $4km^2$ area.

Linking climate to resources

Estimating future air temperature, rainfall, and snowfall are just the first steps towards planning for change. Stakeholders who want more detailed information can create collaborative agreements with SNAP in order to work on projects that link climate data to variables such as permafrost thaw; timing of autumn freeze-up and spring breakup; frequency of flooding events; sea level change; and changes in evapotranspiration. These changes can, in turn, be linked to factors of direct concern to communities and land planners, such as ecosystem shifts; forest fires; agricultural opportunities; risks to infrastructure; and movement of game animals.

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