MEETINGS

Circum-Arctic Map Compilation


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The eyes of the world are increasingly focused on the polar regions. Exploration and assessment of energy and mineral resources for the growing world economy are moving to high-latitude frontier areas. The effects of climatic changes are particularly pronounced at these ends of the Earth and have already attracted worldwide attention and concern. Many recent articles related to the International Polar Year underscore the importance of even basic mapping of the Arctic and Antarctic.

Against this backdrop, an international cooperative effort to produce an updated folio of geologic and geophysical maps for the circumpolar Arctic has developed from an initial agreement signed in 2003 between several national agencies (from Canada, Denmark, Finland, Norway, Russia, Sweden, and United States). Various agencies have taken the lead on separate components (e.g., geologic, tectonic, resources, and geophysical) of the overall effort. The Geological Survey of Norway (Norges Geologiske Undersøkelse, NGU), in Trondheim, Norway, is the headquarters for the gravity and magnetic map compilations and production. Carmen Gaina is the project leader.

The second workshop of the Circum-Arctic Mapping Project—Gravity/Magnetics (CAMP-GM) was held in Trondheim, on 12 and 13 February 2007. The meeting consisted of technical presentations on contributed magnetic data compilations along with detailed discussions of map compilation and production issues. Gravity data were also discussed and included a presentation of the Arctic Gravity Project (ArcGP) free-air gravity compilation by Rene Forsberg (Danish Space Agency). The minutes for this and the previous technical workshop, held in St. Petersburg, Russia, in 2006, are available at www.geodynamics.no (follow the Circum-Arctic Project link).

The assembly of regional geophysical data, especially magnetic compilations, offers a number of interesting technical and theoretical challenges. The ability of the resulting products to reveal large-scale tectonic features makes these challenges worthwhile. The CAMP-GM working group has engaged in interesting practical discussions about the pros and cons of various approaches to the effective merging of individual magnetic surveys into regional grids. Juha Kortonen brings expertise and experience from his role as a lead scientist for the World Magnetic Anomaly Map to this project. Many of the other regional experts in the group bring unique perspectives based on their own work with national-scale compilations. The participating scientists have found that the working group has provided a fertile forum for interchange of ideas and perspectives on technical aspects of data compilation as well as the utility of these regional data for geologic and tectonic interpretation.

The overall goal of the CAMP-GM project is to produce printed maps and make accompanying digital data available to the scientific community during the International Geological Congress, in Oslo in August 2008. The project members invite additional participation by interested scientists and institutions worldwide.

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Climate Change and Disturbance Interactions

Workshop on Climate Change and Disturbance Interactions in Western North America, Tucson, Ariz., 12–15 February 2007

Warming temperatures across western North America, coupled with increased drought, are expected to exacerbate disturbance regimes, particularly wildfires, insect outbreaks, and invasions of exotic species. Many ecologists and resource managers expect ecosystems to change more rapidly from disturbance effects than from the effects of a changing climate by itself. A particular challenge is to understand the interactions among disturbance regimes; for example, how will massive outbreaks of bark beetles, which kill drought-stressed trees by feeding on cambial tissues, increase the potential for large severe wildfires in a warming climate?

Researchers in climatology, ecosystem science, fire and insect ecology, and landscape modeling from across western North America convened in Tucson, Ariz., for a 2 and a half day intensive workshop to identify new research directions in climate change and disturbance ecology. Four working groups focused on different aspects of the response of disturbance regimes to climate change: (1) extreme events and climatic variability, (2) the effects of changing disturbance regimes on ecosystems, (3) disturbance interactions and cumulative effects, and (4) developing new landscape disturbance models. The workshop was structured with the analytic hierarchy process, a decision-support method for achieving consensus from diverse groups of experts without sacrificing individual contributions.

Each work group identified and ranked key research questions for ongoing study: Questions receiving the highest importance ranking were as follows: (1) For extreme events, what are the time-space domains of large-scale ecological and environmental variance, and how are they influenced by the spatiotemporal scales at which climate varies and changes? (2) For ecosystems, what are the effects of disturbances on ecosystem processes and their mechanisms, and how will they change in the future? (3) For disturbance interactions, what are the likely consequences for ecosystem patterns, processes, and services of climate-driven changes in disturbance regimes? (4) For landscape disturbance models, what are the key ecological processes to be included in them? Each question, in turn, generated a set of responses that will provide specific research directions or methodologies to address identified priority research areas. For example, the ecosystems group identified predicting vulnerability to future disturbance and understanding the mechanisms of ecosystem response as most critical. The landscape disturbance modeling group identified five types of ecological processes that should be explicitly represented in landscape modeling: plant dynamics, disturbance, hydrology, carbon, and nutrient cycling, and wildlife movement on the landscape.

Workshop products will include a compendium of deliberations of each group with analysis of differences in the research priorities identified, a synthesis paper in an ecological journal, and topical manuscripts from each work group. The workshop was a collective effort of the Western Mountain Initiative (http://www.cfr.washington.edu/research.fme/wmi/), the University of Arizona Tree-Ring Laboratory (http://www.ltr.arizona.edu/), the U.S. Geological Survey Global Change Research Program, and the USDA Forest Service. Detailed information about the workshop is available from the authors of this article.

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