Radiocarbon and Ice-Core Chronologies During Glacial and Deglacial Times

ESF EuroCLIMATE Workshop, Heidelberg, Germany, 5–7 March 2007

PAGE 278

Accurate timescales are the backbone of palaeoclimatic and palaeoenvironmental reconstructions. Detailed comparison between land, ocean, and ice archives and their respective climate proxies requires high-resolution and accurate dating. For terrestrial and marine climate archives, calibration of radiocarbon (^{14}C) dates provides a common timescale. However, for the time interval between 12.4 and 26 thousand calendar years B.P., i.e., beyond tree-ring-based calibration, the accepted radiocarbon calibration curve IntCal04 relies at present on marine ^{14}C series, with associated uncertainties of the calendar scale. For ages older than 26 thousand calendar years B.P., there is no recommended calibration curve because of timescale discrepancies in the data sets covering that period. Dansgaard-Oeschger (D/O) and Heinrich events in ice cores provide useful templates for high-latitude climate sequences during the last glacial period. Annual layer counting provides an independent timescale, with counting errors caused by false identification of annual layers being small (several decades) in the Holocene. However, such errors may add up to several thousand years during Oxygen Isotope Stage (OIS) 3.

The workshop brought scientists of the European Science Foundation (ESF) EuroCLIMATE program together with external specialists to (1) review recent progress in glacial and late glacial chronologies, (2) discuss new approaches to deriving a high-precision, common timescale for terrestrial and marine archives of climate proxies, and (3) promote cross-European synergies. EuroCLIMATE is a European Collaborative Research Programme (EUROCORES) that coordinates and promotes research on climate variability and the past, present, and future dynamics of the carbon cycle (http://www.esf.org/euroclimate).

Several workshop presentations extended the tree-ring-based ^{14}C data sets with late glacial pine chronologies from sites in Switzerland, Germany, and France, recently cross-matched into a 1600-year-long chronology between 12,500 and 10,600 ^{14}C B.P. Exciting tree-ring-based ^{14}C sequences were shown from new finds of Kauri trees in New Zealand that cover critical time intervals across the glacial. Important progress has also been made in the Greenland ice core timescale (currently GICC05) using multitracer analysis to better detect annual layers. Radiocarbon calibration beyond 26,000 calendar years B.P. now appears feasible with a new model for Cariaco basin sediment sections based on comparison with U/Th dated stalagmites from Dongge and Hulu caves (China) and new coral ^{14}C data.

The importance of high-resolution age control and ^{14}C calibration was demonstrated by the RESOLuTION project (Rapid Climatic and Environmental Shifts During Oxygen Isotope Stages 2 and 3: Linking High-Resolution Terrestrial, Ice Core and Marine Archives), which addresses linkages between terrestrial, marine, and ice-core archives during OIS 3. The DECLAKES project (Decadal Holocene and Late-Glacial Variability of the Oxygen Isotopic Composition in Precipitation Over Europe Reconstructed From Deep-Lake Sediments) presented advances in chronology and stratigraphy of sediment records from five European lakes based on detailed microfacies and $\delta^{18}O$ analyses, and the CHALLACEA project (High-Resolution Reconstruction of Late-Glacial and Holocene Climate Variability in Equatorial East Africa Based on Laminated Lake Sediments From Mount Kilimanjaro) presented advances in the chronology of climate change in equatorial East Africa from before the Last Glacial Maximum to the present.

Participants noted the strong synergies resulting from close collaboration between 'producers' and 'users' of chronologies, as offered by the ESF EUROCORES concept. The initiative to extend the Kauri database was considered essential.

The workshop was funded by ESF and PAGES.

The full text of this meeting report can be found in the electronic supplement to this *Eos* edition (http://www.agu.org/eos_elec/).

—BERND KROMER, Heidelberg Academy of Sciences, Heidelberg, Germany; E-mail: bernd.kromer@iup.uni-heidelberg.de; BARBARA WOHLFARTH, Stockholm University, Stockholm; DANIELA TURK, European Science Foundation, Strasbourg, France.

ABOUT AGU

Several 2007 AGU Awards were presented at the Joint Assembly in Acapulco, Mexico. Winners were introduced by President Tim Killeen in a formal ceremony held on 25 May 2007. An honors fiesta followed the ceremony.

Diane Wickland Receives 2007 Edward A. Flinn III Award

PAGE 280

Citation

It is with great pleasure that we recognize and honor the accomplishments of Diane E. Wickland, the 2007 winner of the Edward A. Flinn III Award from the American Geophysical Union, for her pivotal contributions to the development of the emerging field of biogeosciences.

Diane Wickland has fundamentally shaped the emerging field of biogeosciences by championing programs aimed at quantifying the role of terrestrial ecosystems in the Earth system. These range from the early efforts to determine the controls on the global methane budget, through pioneering efforts to employ satellite remote sensing techniques to study ecosystems, to international field programs that aim to determine the role of ecosystems in the global climate and carbon cycles. It was the interdisciplinary nature of these programs, which required physical scientists to interact with chemists and biologists, that more than anything else led to the increased recognition of the role of the biota in the Earth system, and the rapid expansion of biogeosciences.

Diane's efforts have been extraordinary, and truly broad in scope. Whether through

efforts in spearheading interdisciplinary carbon cycle research within the U.S. Global Change Research Program, as the most visionary U.S. promoter of the international Large-Scale Atmosphere-Biosphere Experiment in Amazonia (LBA), or as the program

manager of the highly interdisciplinary NASA Terrestrial Ecology program, Diane serves the scientific community with skill, tremendous energy, and absolute integrity.

In particular, under Diane's leadership, the NASA Terrestrial Ecology program has quickly grown from humble beginnings into an innovative global research program that combines remote sensing, computer modeling, and targeted field campaigns to examine the two-way linkages between terrestrial ecosystems and the Earth system. Most notably, her program has spearheaded U.S. participation in large-scale campaigns such as BOREAS and LBA, which have fundamentally changed our understanding of the role of biological systems in a changing planet.

How has Diane been so effective? We believe that she succeeds as a program manager and as a scientific leader because she is, at heart, a scientist. Her scientific background allowed her to convince ecologists of the value of remote sensing tools for studying ecosystems, as well as to convince geophysical scientists of the key role of the biosphere. Her continued understanding of the science underlying complex interactions between biosphere, atmosphere, and climate allows her to manage the Terrestrial Ecology program in a way that encourages discovery, innovation, and leadership by the scientists involved.

It is also important to note that throughout her career at NASA, Diane has always put science—and scientists—first. She has worked to promote the careers of younger scientists, assist in the training of new students and postdocs, and forge international partnerships for research and training. She works tirelessly on behalf of the scientific community, going the extra mile to negotiate complex international scientific agreements and taking a leadership role in U.S. interagency efforts to support carbon cycle and ecosystems research. Her service to the scientific community has been invaluable and unselfish.

In summary, it seems especially fitting that Diane, a visionary leader in promoting the emerging field of biogeosciences, is being recognized with an award acknowledging "unselfish cooperation in research." We are all fortunate to have a colleague like Diane, who exemplifies these qualities so incredibly well.

—JONATHAN A. FOLEY, University of Wisconsin, Madison; and SUSAN TRUMBORE, University of California, Irvine.

Response

It is an honor to receive the 2007 Edward A. Flinn III Award, and I thank Jon Foley and Sue Trumbore for nominating me, the scientists who supported the nomination, and AGU for selecting me. The extremely generous citation is rather overwhelming! I will always treasure this award because it represents recognition from the scientific community I respect and serve.

This award is also very special to me because I had the pleasure of working with Ted Flinn early in my career with NASA. I recall the great passion and dedication he brought to his work. No one cared more about the science or worked so tirelessly for its future. To be associated with Ted in this way is a very high compliment!

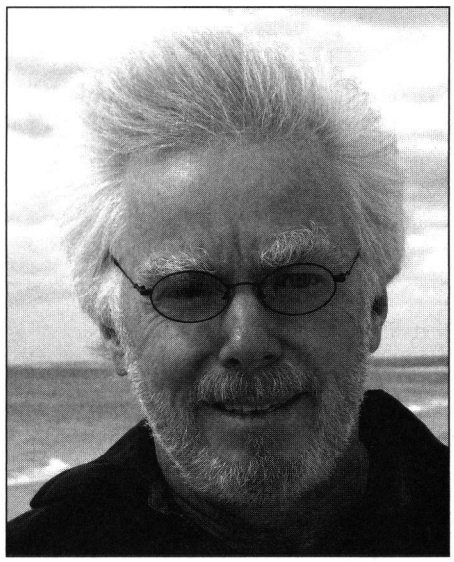
For me, the great joys of scientific program management come from the scientific understanding and results that I enable and from helping to advance the careers of Earth system scientists. One of the great challenges in scientific program management is the imperative to constantly adjust the program balance in order to maintain high relevancy and achieve results in our continuously changing scientific, technological, societal, and political environments. It is a challenge to find ways to be effective while working within the large federal bureaucracy. I have struggled to facilitate the resolution of the scientific and interpersonal conflicts that occasionally impede scientific cooperation. This work is exciting, frustrating, and important (usually), but it often goes unheralded. Thus I find it heartening to see this type of scientific contribution recognized by AGU.

I have been enormously privileged to work with many fine scientists, engineers, and managers throughout my career and am deeply appreciative of the knowledge and skills I have acquired through close interactions with them. The very fact that this award is given for "unselfish cooperation" means that many others share credit for the contributions attributed to me. I can't possibly name them all here, but I would like to acknowledge and thank certain groups of people. First and foremost, I thank the scientists who do the research, keep me current on the state of the science, and bear with the bureaucratic and programmatic exercises I put them through. My colleagues and bosses, past and present, at NASA have taught me about all aspects of program management and have enthusiastically offered their knowledge, experiences, and time to help solve problems. My program management counterparts in other U.S. government agencies, and especially the Carbon Cycle Interagency Working Group, have unselfishly committed to the teamwork necessary for advancing interagency and interdisciplinary cooperation in global change science. The scientists and managers in Brazil, Canada, Europe, Japan, Africa, and elsewhere have been wonderful partners in building successful international scientific collaborations. Throughout, Paul ("The Bold") Donis endured much and provided sorely needed encouragement and humor! I am very grateful to these people who all share in my achievements!

—DIANE E. WICKLAND, NASA, Washington, D.C.

Michael Mayhew Receives 2007 AGU Excellence in Geophysical Education Award

PAGE 280



Citation

It is both an honor and a privilege to present Michael Mayhew as the 2007 recipient of the AGU Excellence in Geophysical Education Award. I do so on behalf of the geosciences community and the dozens of geoscientists who wrote letters documenting the sustained commitment and impact Mike has had on geoscience education. He is highly deserving of this recognition because his contributions to geophysical education have resulted in (1) a significant and long-lasting cultural change in the community such that geophysical education is embraced and promoted by scientists across the discipline; and (2) the development of a vibrant and highly successful geophysical education research community dedicated to advancing understanding of how we teach and learn about Earth.

In 1996, Mike assembled a team of scientific leaders who articulated the wide-ranging educational needs of the community and formulated a vision and strategy for developing a new education program within the NSF's GEO directorate. Their report, entitled "Geoscience education: A recommended strategy," was the basis for creating the Geoscience Education program, the first and one of the few education programs within a research directorate at NSF. This report and funding program jump-started a revolution that took geoscience education from one of the most anemic education