Motivation for Open Climate Community (20071029, for R. Orbach)

1) The demand for climate change information is growing and now extends far beyond the IPCC assessment community or the science community as a whole. New members of the climate community (Agencies, Corporations, etc.) have diverse information needs that are not met in a straightforward fashion by IPCC-type diagnostics. Models are tightly held by a small number of development groups, and the processes of validation and implementation are not transparent. The models are driven by science requirements (or, perhaps, the desires of scientists) and do not adequately integrate the requirements of non-scientific customers. The development cycles for models are several years, and with the new demand for climate change information, this development cycle is far longer than customers can wait. For virtually any questions posed by a customer, be it energy, agriculture, transportation, public health, etc., there is an intelligent way to seek the answer to the question irrespective of new model developments and simulations. We need a way to develop optimal information to cover this new customer base.

2) A phenomenon of the past decade is the emergence of the open source software community. The culture of the open source community extends beyond the development of software, and there is growing acceptance that open communities form one of the most effective ways to address problems of extreme complexity. I advocate that an open climate community offers the most effective way for the science community to meet the nations needs. While the climate community has pioneered the development of models for use by the community, this is not the same as development and ownership of models by the community. One important aspect that is missing is the transparency of the development process, and especially the methods of validation. Like an open market, without transparency and a reasonable expectation of validity, it is difficult to obtain community buy in. An increasing number of individuals in the climate community are accepting of open source concepts at one level or another. Investments by U.S. government in the past decade have put in place many elements of a foundation which could be used to support an open climate community. There are, however, hurdles that must be overcome to create an open source approach to climate modeling. Many of these hurdles are institutional or cultural.

3) Many federal agencies have made important investments in the climate problem. No federal agency has the complete portfolio of assets. Further, as the customer base for climate information is extended, new types of information will be required. Virtually all federal agencies require an open source license for software, but few, if any, adhere to the culture of open source development. A key ingredient for the success of an open source community to produce and service climate information is the adoption of community governance models. Again, a governance model that is transparent and in which constituencies have a reasonable expectation of their needs being addressed and met is needed; it encourages participation and investment by multiple sources. Without the development of new governance models by which to manage projects, it is unlikely that there will be timely and effective extension by the climate science community to address the expanding need for climate information.

Some possible references for more in depth reading

Open Source Communities and Their Impact

http://climateknowledge.org/figures/Rood_Library/Kogut_Open_Source_2001.pdf
(Open-source software development and distributed innovation)

http://climateknowledge.org/figures/Rood_Library/Demil_open_source_governance_2006.pdf
(Neither market nor hierarchy nor network: The emergence of bazaar governance)

http://climateknowledge.org/figures/Rood_Library/Shah_open_source_governance_2006.pdf
(Motivation governance and the viability of hybrid forms in open source software development)

http://climateknowledge.org/figures/Rood_Library/vonKrogh_open_source_2007.pdf
(The open-source software phenomenon: Characteristics that promote research)

A model for community project governance

http://climateknowledge.org/figures/Rood_presentations/20071029_Community_Governance_Model.pdf

An aging document by Rood et al.

http://www.usgcrp.gov/usgcrp/Library/models2001/foreword.htm
(High-End Climate Science: Development of Modeling and Related Computing Capabilities)

Rood's University of Michigan Home Page

http://aoss.engin.umich.edu/people/rbrood