

Minutes of the Ninth ICASA Open Forum on Crop Modeling and Decision Support Systems



ASA-CSSA-SSSA 2005 Annual Meetings, Salt Lake City, Utah

Monday, 7 Nov. 2005, 7:30-9:00 PM **Meeting chair:** Gerrit Hoogenboom

Introductions

- ICASA in brief: A brief introduction to the general goals and objectives of ICASA was presented.
- People were asked to introduce themselves and explain briefly what they expected to get out of the meeting and/or ICASA. Approximately 30 people attended. Responses included:
 - To improve linkages between experimentalists and modelers, especially to improve the quality of the science in models.
 - To improve the use of simulation models in international development efforts, which arguably has not met earlier expectations.
 - To learn how people use models.
 - To help in model development.
 - To learn how NASA data products might be used with crop models.
 - To explore ways to use genetic information in models.
 - To promote use of modular models/object oriented programming.
 - To see how the European Society of Agronomy can interact with ICASA or the American Society of Agronomy.
 - To interact with people using models.
- The suggested agenda was reviewed with no changes or additions from the floor.

Report from the ICASA Board

Jeff White outlined progress on the “reinvention process.” The by-laws were simplified by assuming that ICASA will not handle funds. Emphasis is now given to ICASA operating largely through (board-approved) working groups and using the Internet as the primary medium for communications. The co-chairs are drafting a statement on new directions for ICASA.

Current membership is approximately 300, but people who have not returned their signed membership forms should do so, or they will be dropped! ICASA does not charge for membership but expects active participation by its members in one or more activities.

News and Activities in 2005

- Andre du Toit – Andre passed away in a house-repair accident in February, 2005. He was an enthusiastic user and developer of agricultural DSS tools and will truly be missed.
- A group of programmers from APSRU visited the University of Florida (and other locations) in a global tour to learn how other modeling groups deal with a diverse range of issues. In Gainesville, much of the discussion was on modularization and use of standards, including future use of XML.
- The ICASA Forum (www.icasaforum.net) has been established as a new information exchange for ICASA members. Two important advantages of the forum over e-mail listservers are that it minimizes circulation of inappropriate e-mails (e.g., auto-replies for “out-of-office”) and that it allows posting of

documents. The Forum offers less functionality than a full “wiki” interface, so we will monitor the Forum’s usage and explore more complete tools if demand is sufficient.

- Training workshops
 - Ghana, October 2005. A follow-up workshop was held for East and West Africa where trainees from a 2004 course returned with specific sets of data. This format, emphasized follow-up to previous training, was judged highly successful. This workshop was jointly sponsored by CIAT-TSBF and ICRISAT.

Upcoming Events (details at www.ICASA.net)

- “Management of Natural and Environmental Resources for Sustainable Agricultural Development.” Portland, Oregon, 13 to 17 February 2006. WMO and USDA.
- Biological Systems Simulation Group, Ft. Collins, Colorado; 11-13 April 2006 (<http://www.ars.usda.gov/News/docs.htm?docid=11292>)
- “Gene-Plant-Crop Relations: Scale and Complexity in Plant Systems Research, Wageningen”, The Netherlands, 23 -26 April 2006 (www.wur.nl/frontis)
- European Society of Agronomy (Sept. 2006, under discussion)
- Int. Symposium on Modeling Farming Systems – There is a proposal to hold a joint meeting in Sept. 2007 among the European Soc. Agronomy, the Int. Environmental Modeling Soc., ICASA, and the American Soc. Agronomy. Sicily has been offered as a site but other nominations are welcome.
- Training
 - A DSSAT 4 training workshop will be held at the University of Georgia, Griffin, GA; May 2006
 - The EU-supported project AGRIDEMA (a non-ICASA group) will conduct training in various models (CropSyst, DSSAT4, etc.) for EU country members.

Ongoing or New Working Groups Under ICASA or otherwise

Jeff White explained that working groups are expected to become a major activity of ICASA. As more groups become established, we would like all ICASA members to participate. The core goal of each group should be to increase the effectiveness of systems-related activities whether research or application, through collaboration. Given ICASA’s focus on collaboration through use of standards, most groups should be more than discussion centers. They should seek to promote use of data or software standards. In post-meeting discussions among board members, it was agreed that the Board should prepare some guidelines for working groups in terms of goals, life-cycles, reporting, and perhaps most important, how ICASA will endorse or certify groups. At the moment, it is recognized that the groups are in an experimental phase.

International Consortium for Sugarcane Modeling: Abraham Singels (South African Sugarcane Research Institute) outlined plans for the International Consortium for Sugarcane Modeling. The overall goal is to promote modeling of sugarcane with emphasis on developing, maintaining and promoting use of a model that is compatible with the DSSAT framework and that can be used by the sugarcane industries worldwide. The model would be open-source. It is hoped that much of the data will be freely exchanged. The ICSM expects to develop

an MOU for institutions by December 2005 and to be requesting proposals from members by April 2006. An inaugural meeting will be held in May 2006 in Khon Kaen, Thailand, in conjunction with the ISSCT Agronomy Workshop. Although discussed in the context of ICASA working groups, the ICSM is currently independent of ICASA. Since it involves formal agreements and exchange of funds, one scenario might be for the ICSM to be viewed as an ICASA-endorsed or -partner consortium. (The ICASA Board should review relations with ICSM.) Meanwhile, ICASA members interested in sugar cane modeling are encouraged to contact Rasack Nayamut (rnayamut@msiri.intnet.mu) or Maurits van den Berg (maurits.vandenberg@sugar.org).

Data Standards: The working group expects to finish the new data standards document in Dec. 2005, which will be posted on the web site. In terms of the current ASCII standards as implemented in DSSAT v4, this revision is an incremental change. It is expected that the DSSAT4 software will maintain backward compatibility. More fundamental changes are underway, however, in the standards to extend them to relational databases and XML. In doing this, the core of the standards becomes a master list of variables, which includes definitions, units, validation information (usually maximum and minimum values), and relations among the individual variables. The master list thus can be considered a data ontology.

A tool is being developed by Jim Jones's group (U. Florida) and Jeff White that creates a relational database from the ICASA master list. Research groups can select a subset of variables according to specific interests (e.g., rice-wheat systems or soybean improvement).

Parameter estimation and data assimilation: Dan Wallach has offered to chair a working group on these two inter-related topics. "Data assimilation" is increasingly used in other fields where parameter estimation is problematic. Observed data are used to guide model forecasts. Techniques include Kalman filtering. Dr. Wallach is co-editor of a book on modeling techniques that is due out in March, 2006 (see the ICASA web site for further information)

Gene-based modeling: Carlos Messina (Pioneer HiBred International) and Jeff White are organizing a group use of genetic information to improve crop models. An introductory notice is will be posted on the ICASA Forum. One ongoing effort is to organize data from a large set of international winter wheat nurseries (IWWPN) in ICASA format, including weather and management data to provide a foundation for gene-based wheat modeling. The nurseries was run from 1968 to 1981 and involved over 80 locations (approx. 40 in any year) and 30 cultivars.

Training: Samuel Adiku (Univ. Ghana) suggested (via e-mail) that a group pursue ways to improve training related to modeling, especially for developing countries. This should not just be "how to run model X" but emphasize understanding how models work and how to apply them correctly to different research or decision support situations. The consensus was that a certificate or university credit would be more appropriate than a formal degree program (e.g., MSc or PhD). One possibility is to develop a set of courses through a distance education program. The Univ. Nebraska currently has an on-line seminar course to discuss modeling approaches (http://agronomy.unl.edu/distance_ed/2005fall/baenziger/course_nres896.htm). There is also discussion to

videotape the DSSAT Training workshop and make it available either on-line or via DVD. A formal decision to create a working group is pending.

Global change/Climatic risk: Strong interest was expressed for a group to look at applications of models in global change research. The suggestion was made that coverage should be broad, including carbon sequestration, biofuel production and less clearly, climate risk if affected by global change processes. G. Uehara emphasized that rising fuel costs have stimulated much greater interest in analyzing biofuel production scenarios. The working group should examine how ICASA can promote more accurate assessment of biofuel options, including estimating production costs expressed in terms of fossil fuel inputs or net cost in greenhouse gas emissions (e.g., through land preparation, irrigation or inorganic fertilizers).

Other suggestions: Other topics that were mentioned included cotton modeling and modeling pest and disease effects, which had also been discussed during the 2004 Open Forum.

The ICASA web site update (<http://www.icasa.net>)

People were encouraged to visit the ICASA web site to learn more about specific activities or modeling-related issues. Special emphasis was placed on:

- Data exchange: people were encouraged to submit new datasets.
- ICASA Forum: explore the ICASA Forum and use it as an alternate to the ICASA listserv.

Software/Project/Team news

- APSIM – Version 4 is about to be released with a more complete graphical users interface.
- CropSyst – A new version is available
- DSSAT – An update will be released as Version 4.0.2.0.
- SEAMLESS – See <http://www.seamless-ip.org/>
- RZWQM – The RZ-DSSAT Hybrid model will be improved with the latest version of the DSSAT CSM model and improvements in RZWQM.

Board meeting

No formal board meeting was held but in discussions among individual board members who attended the Forum, the consensus was that the working groups are an important initiative. However, ICASA needs to develop a mechanism to develop and promote effective groups. We don't want to start a large number of groups and then see them quickly fade away with no active participation.

Useful information:

- ICASA stands for “International Consortium for Agricultural Systems Applications”
- Membership is free – but you have to agree to basic principles (www.icasa.net/membership/index.html)
- Co-chairs:
 - Martin van Ittersum, Wageningen University, the Netherlands
 - Jeff White, USDA-ARS, Phoenix, Arizona, USA

- Board members:
 - Gordon Tsuji, Univ. Hawaii, USA (Secretariat)
 - Samuel Adiku, University of Ghana
 - Walter Bowen, International Fertilizer Development Center (IFDC) - Asia Division, Bangladesh
 - Mauricio Fernandes, EMBRAPA Trigo, Brazil
 - Attachai Jintrawet, Chiang Mai University, Thailand
 - Jim W. Jones, University of Florida, USA
 - Brian Keating, APSRU, Australia
 - Martin Kropff, Wageningen University, The Netherlands
 - Wayne Meyer, CSIRO Land & Water, Australia
 - Cynthia Rosenzweig, Goddard Inst. For Space Studies, USA
 - Claudio Stockle, Washington State University, USA
 - Philip K. Thornton, ILRI, Edinburgh, UK
 - Goro Uehara, University of Hawaii, USA
 - Daniel Wallach, INRA, France
- Budget for 2005: \$0 US
- Main web site – www.icasa.net
- Forum: - www.icasaforum.net
- Listserv - www.icasa.net/listserv/index.html
- Recent publications on modeling <http://www.icasa.net/publications/index.html>:
 - Wallach, D., D. Makowski, J.W. Jones 2006. Working With Dynamic Crop Models: Evaluating, analyzing, parameterizing and using them. Elsevier.
http://www.icasa.net/publications/dynamic_crop_models.html
 - Yin, Xinyou and H.H. van Laar. 2005. Crop Systems Dynamics: An ecophysiological simulation model of genotype-by-environment interactions

Prepared by Jeff White and Gerrit Hoogenboom Nov. 2005

Reviewed by the Board Dec. 2005

Posted to ICASA Forum on 13 Jan. 2006.