RMA

Founded in the early 1980s, the Resource Modeling Association (RMA) is a group of applied mathematicians, applied population biologists, fisheries scientists and resource economists, primarily from the west coast of North America, who organize annual meetings to discuss the application of models to resource management.

RMA Newsletter Fall 2010

Saving the Black Rhino *by John Hearne*

Although Black Rhino population numbers in South Africa have improved over the last three decades, new outbreaks of poaching are threatening this species.

The success of population growth in South Africa has attracted some undesirable attention. Below are some recent headlines by the South African Press Association (see www.iol.co.za):

- September 30, 2010: "A wildlife organization warned that rhino poachers were now reverting to poison to kill the animals."
- October 1, 2010: "More than 200 rhinos have been killed for their horns this year - and Desmond Tutu says enough is enough."
- October 5, 2010: "Police and wildlife officials have made another breakthrough into the recent spate of rhino horn poaching."
- October 5, 2010: "Twenty-one people have been arrested in connection with rhino poaching in South Africa in the past three weeks."
- October 6, 2010: "Environmental Affairs Minister Buyelwa Sonjica has unveiled an elite police unit to deal with rhino poachers."
- October 6, 2010: "Rhino owners say they are frustrated with the SAPS's delay in granting ranchers firearm permits so they can deal with rhino poachers."
- October 7, 2010: "Three men have appeared in a KZN court after the killing and dehorning of a rhino."
- October 29, 2010: "President Jacob Zuma has expressed concern about rhino poaching in the Great Limpopo Transfrontier Park."
- October 26, 2010: "A rhino shot nine times by poachers has been moved to a Johannesburg zoo for her recovery. … more than 200 rhinos had been slaughtered since the start of the year. … well-organized syndicates comprised five levels. Level one were the poachers, level two the controller who organized these gangs, and level three the purchaser. Then came the individuals who coordinated the shipping of horns abroad and lastly international buyers."

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2011 World Conference on Natural Resource Modeling

in Ottawa, Canada June 14-17, 2011... see p. 2

Inside:

Join us in Ottawa for an Amazing Summer Experience

by Rick Moll

The 2011 World Conference on Natural Resource Modeling will be held on June 14-17 in Ottawa, Canada. The Telfer School of Management at the University of Ottawa will serve as the venue for the conference which will be hosted by Dan Lane of the Telfer School, assisted by the RMA secretary, Rick Moll, of Statistics Canada. The conference theme is "Modeling for a Sustainable Environment: Climate Adaptation and Energy, Socio-Economic-Ecological Systems." Five keynote speakers have been invited. Maja Schlüter, Liebniz-Institute of Freshwater Ecology and Inland Fisheries, Germany will talk on Modeling the Resilience of Social-ecological Systems; Leif Sandal, Norwegian School of Economics and Business Administration, Norway will present "Towards an Ecosystem Based Management of the Main Commercial Fisheries in the Barents Sea"; David Martell, University of Toronto, Canada will talk on Putting and Leaving More Fire on our Forest Landscapes and Robert Hoffman and Bert McInnis from whatIf Technologies

Inc, Ottawa will give a live demonstration of their energy simulation model entitled "Modelling Natural Resource Systems: the Case of Energy and GHG Emissions and the Canadian Energy Systems Simulator (CanESS)." Further information about the conference is available at the RMA website www.resourcemodeling.org.

Participants will have many chances to interact professionally and socially, including a barbeque cookout with the theme "Dueling Webers" at Chez Moll on the banks of the Rideau River. The menu has not been decided yet but the pit boss Joe St. Lawrence with his team of three Weber kettles and two smokers promises a true northern American charcoal grilling event.

The Telfer School of Management is located in the new Demarais Building on campus downtown Ottawa, within walking distance of the University of Ottawa residences, downtown hotels and the popular Byward Market area, where there are many fine restaurants. The residences at 90 University, offer air-conditioned suite-style units which include two separate bedrooms – each with a double bed – a large kitchenette equipped with microwave, fridge, table and chairs, and a private washroom with shower.

Ottawa is a metropolitan destination, a cultural mosaic with a bilingual population exceeding one million residents. Nestled along the Ottawa River, which forms the border between Ontario and Quebec, this vibrant Capital boasts stunning architectural, historical and national monuments and treasures. Just a ten-minute walk along the Rideau Canal, you can explore scenic Parliament Hill and experience the Changing of the Guard Ceremony showcasing a stirring military drill. Surrounded by 170 kilometers of recreational pathways along the Rideau Canal, the Ottawa River and Gatineau Park, cyclists, inline skaters and nature lovers enjoy the multitude of scenic trails. Lakes, rivers and the canal close by make water sports very popular. Canoeing, kayaking, fishing, boating, and sailing are just a few of the activities available, with boat cruises running daily. Summer weather is very pleasant; the average high temperature in June is 75 degrees F, the average low is 55 degrees F. A video describing the city can be found at www.videojug.com/film/travel-guide-ottawa-canada.

So mark June 14-17, 2011, on your calendar for participating in the Resource Modeling Association's annual conference. You will find it a most rewarding experience.

Saving the Black Rhino

(continued from page 1)

Until a few years ago South Africa (RSA) was relatively free from rhino poaching. Over three decades from the 1960's the black rhino population in RSA increased four-fold to 600. During this same period Africa's black rhino population decreased alarmingly from over 30,000 to fewer than 3,000. This prompted the Natal Parks Board (now part of KZN Wildlife) to formulate a plan to increase the RSA population to 2,000 as quickly as possible. This was believed to be a sufficiently large number to ensure the survival of the species even if the rest of Africa's populations were eliminated.

At this time most of RSA's black rhino were concentrated in Umfolozi-Hluhluwe and some neighboring reserves. High mortality and low fecundity were observed as a consequence of high density. By translocating a proportion of the animals out to reserves without rhino it was felt that the total RSA population would increase faster as each population would enjoy lower densities. The question then arose as to how many to translocate and what age and sex they should be. The decision was made that the balance between males and females should be maintained in any translocated population for social reasons. Regarding age, one theory was that younger animals (sub-adults) should be translocated as they would live longer in their new habitat than adults.

It was about this time in 1988 that I first travelled to Mkuze Game Reserve to work with regional scientist, Peter Goodman, on this problem.

Peter's office at Mkuze was a rondavel or thatched round mud-hut. On the roof were some solar panels which fed electricity through a converter into a car battery. This in turn was transformed to the appropriate voltage to run his PC. There wasn't enough power to run an electric light as well. During the afternoons, storm clouds would gather and it would get quite dark in the hut. We would persevere for another hour or so until the batteries ran out for the PC and we were forced to have a break. Nevertheless, we were able to develop an age-sex structured model.

Data was scarce but improving due to the annual population count that was undertaken. It was a few years later that I came to appreciate the effort and danger involved in collecting the data I so glibly asked for. In trying to identify some scars on a particular rhino during a census Peter was charged. One attack ripped open his thigh another pierced his diaphragm and punctured a lung. Fortunately there was a helicopter nearby and Peter was carried into that, flown to a nearby airfield, and then by another aircraft to a hospital over 100 kilometers away. Peter pulled through in the end but very nearly did not make it.

The models showed that the global population would increase faster if adults were translocated rather than sub-adults. This also coincided with changing views on the wisdom of starting new populations with sub-adults. (Google: elephant juvenile delinquency.) So the extent to which the model results influenced the translocation policy is difficult to say. Later an issue arose with game managers of the source populations reluctant to release "their" animals for translocation. They did not understand the point of it as their population was still below carrying capacity. A simplified version of the model was then written in the form of a game and a couple of years ago, when last I enquired, it was still being used for educational purposes with game managers. It has helped them to understand better the effect of density on populations and other related population management issues. Although it was not the original objective the outcome of the original modelling has had a much wider influence on management than we ever foresaw. Let us all hope now that the poaching syndicates can be brought under control.

Francis Pantus Elected to Board

Francis Pantus was recently elected to serve a three-year term on the RMA board of directors. Dr. Pantus is an Associate Professor of Integrated Modelling for Natural Resource Management at the Australian Rivers Institute at Griffith University. Francis has been an active participant at RMA conferences, presenting talks on spatial modeling and evaluation of strategies for managing the environment. He replaces Olli Tahvonen of Helsinki University who recently completed a three-year term on the board.

RMA

The official newsletter of the Resource Modeling Association

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PRESIDENT'S COLUMN

Supporting Our RMA

by Keith Criddle

I fondly remember my first RMA meeting. It was in Ithaca in October 1990. I had just completed my first year on the Economics faculty at the University of Alaska Fairbanks and I was looking for a professional association that fit with my interests in interdisciplinary research and modeling. I had attended annual meetings of the American Economics Association, the American Agricultural Economics Association, and the American Fisheries Society but was put off by the enormous number of participants, the multiplicity of concurrent sessions, the aggressive character of questions following the presentations, and the paucity of people who shared my interests. In contrast, the RMA meeting involved 80 or so modelers from a variety of disciplines and at a variety of career stages. Presentations elicited questions that reflected shared interests, a love for new ideas and novel applications of established methods, and warm collegiality; I knew then that I had found a professional home.

It is hard to believe that 20 years have passed since that meeting at Cornell. I was then a young assistant professor and father; I am now a professor, a grandfather, and no longer quite so young. RMA remains my professional home for the same reasons I was originally attracted to the association. I expect that many RMA members value the association for the same reasons that I do: the opportunity to associate with fun colleagues doing interesting work.

Last summer's meeting in Helsinki upheld RMA tradition. The upcoming meetings in Ottawa (June 2011) and Brisbane (July 2012) also promise to be excellent. Under the leadership of Steve McKelvey and Bob Fray, the association has been incorporated as a stand-alone non-profit corporation.

Catherine Roberts has provided outstanding service as editor of our journal, *Natural Resource Modeling*, as we have shifted publication to Wiley-Blackwell. And, most recently, Steve McKelvey has agreed to serve as our treasurer, taking over from Ken Lyon who has ably overseen the RMA budget for almost as long as I have been an RMA member.

It would seem that all is well with RMA and NRM, but that impression is not quite correct. Our small numbers mean that small year-to-year variation in the number of meeting participants make the difference between breaking even or operating our annual meeting at a loss. Our small numbers make it difficult to maintain our tax-exempt status. The small number of manuscripts submitted to NRM makes it difficult to maintain a regular publication schedule which in turn affects library interest in NRM and our impact factor. To be more resilient, we need to increase our membership by at least 50% and we need to increase the number of manuscripts submitted to NRM by a similar amount. To attract good manuscripts, we need to maintain or increase our impact factor. To increase our impact factor, we need to attract more good manuscripts. Resolution of this chicken-and-egg conundrum lies, in part, in increasing memberships in RMA. Please renew your membership and invite your colleagues to join. Let them know about our journal and our meetings. Tell them why you are a member of RMA. Consider submitting papers to NRM and invite your colleagues and students to do so; tell your colleagues that NRM's review process is rigorous but that the process is also considerate and supportive.

I look forward to seeing you in Ottawa.

Helsinki and the Lutheran Cathedral.

Jim Sanchirico and Olli Tahvonen at the banquet.

The Helsinki Report

by Rick Moll and Bob Fray

The theme for the 2010 World Conference on Natural Resource Modeling was "Integrating biology, economics and mathematics for sustainable use of natural resources." It was held June 16-19, 2010 at the Swedish-Finnish Cultural Centre, Hanasaari, Espoo on the outskirts of Helsinki and hosted by Olli Tahvonen. The conference consisted of five half-day sessions of invited talks and contributed papers. The opening address by Ilkka Hanski (University of Helsinki) entitled "Habitat Fragmentation: Theory of Biological Consequences and Management Applications" presented an historical perspective on human land use impacts on the composition of habitats on Earth during the last 10,000 years. Using a mixture of theoretical and landscape ecology within a spatial matrix population model he described the evolution of woodland key habitats stressing the nonlinear response of population structure to habitat change. In the afternoon, James Sanchirico's (University of California, Davis) keynote talk addressed the "Role of Bioeconomic Modeling in the Design and Analysis of Ecosystem Based Management Policies." His presentation focused on how multi-species optimal policies differ from single species approaches. Day two opened with a keynote address from Anniki Makela (University of Helsinki) entitled "An Ecological Approach to Management-oriented Forest Growth Models." It demonstrated Finnish expertise in forest growth modelling and economic optimization of forest management regimes (thinning and rotation schedules). The second part of the lecture focused on how carbon is assimilated in the stand growth dynamics using models of leaf photosynthesis. These carbon models are well established showing how carbon is allocated both amongst trees and within trees.

Conference organizers Olli Tahvonen and Jaana Bäck.

On Friday afternoon the participants went for a marine and cultural field trip to Suomenlinna fortress, where we learned that its construction began in 1748 by Sweden and it was surrendered to Russia in 1808. After 110 years of Russian rule Finland gained independence from Russia. It was renamed Suomenlinna, the castle of Finland, and in more recent times has acquired UNESCO World Heritage status. The outing culminated with an excellent dinner in the beautiful banquet hall at Suomenlinna which included specialties of the region.

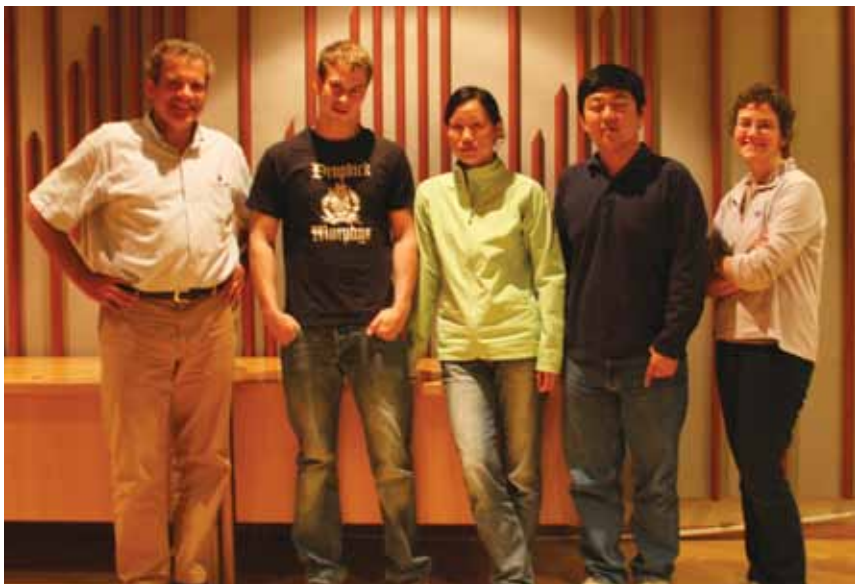
The conference concluded Saturday morning with a session of contributed papers and the presentation of student awards.

Congratulations to this Year's Student Award Winners

For a number of years the board members of the journal *Natural Resource Modeling* and of the Resource Modeling Association have been awarding prizes to the students presenting outstanding papers at the annual conference. This year three students each received prizes of 100 Euros. Xiaozi Liu from the Norwegian School of Economics and Business Administration presented a paper titled "Global Warming and International Fishery Management: Does Anticipation of Temperature Change Matter?" Hao Ye from the Scripps Institution of Oceanography at the University of California, San Diego gave a talk on "Comprehensive Incentives for Reducing Chinook Salmon Bycatch in the Bering Sea Pollock Fleet: Individual Tradable Encounter Credits." Fabian Zimmermann of the University of Bergen spoke on "Establishing an Optimal Harvest Feedback Rule for Fish Stocks under Consideration of Size-dependent Effects."

Below: Steve McKelvey (left) and Catherine Roberts (right) with student award winners Fabian Zimmerman, Xiaozi Liu, and Hao Ye.

All those who participated in the conference appreciate greatly all the work and planning done by Olli Tahvonen and his wife Jaana Bäck. The program, the venue and all the accompanying events were outstanding, and everyone present enjoyed a wonderful professional and social meeting.



Letter from the Editor *It's a wrap; 646 pages with lead authors from 13 different countries*

by Catherine Roberts, Editor Natural Resource Modeling

As we wrap up our year, Volume 23 has been completed. We published 646 pages with lead authors from 13 different countries (five papers from the United States, two each from India, Italy, Australia, Norway, France, and the Netherlands, one each from Romania, Canada, the United Kingdom, New Zealand, Finland, and Japan). Indeed, we are an international journal! Our arrangement with Wiley is to publish 600 pages a year, so we're doing just fine.

Our working relationship with Wiley publishers is doing well. I meet two or three times a year with our management team to develop strategies for promoting the journal. We are currently exploring the possibility of publishing extended abstracts (5-10 pages) related to talks from our annual World Conferences. This would aid researchers in some countries in securing travel funds for our meetings, but we need to make sure that the influence on our impact factor would not be negative. Our focus this year needs to be on increasing our impact factor. Even though the journal has been publishing for 23 years, our first impact factor was issued in 2008 at 0.3. In 2009, it doubled to 0.6, but in 2010 it slid back to 0.489. The impact factor is calculated by counting how many citations of papers that we publish are made in papers published in other journals. As we develop a longer track record with impact factors, we hope to see this number improve.

The editorial board welcomes proposals for special issues connected to conferences or special sessions at larger meetings. Simply send an email to me at editor@resourcemodeling.org to begin a conversation. I am working on a special issue to mark the 25th anniversary of our journal, which will be published in January 2012. It's shaping up to be a very interesting issue, with retrospective papers that also speculate on the future of several fields represented by our interdisciplinary journal.

About RMA

The Resource Modeling Association is an international organization of scientists who are interested in using quantitative models to study issues concerning natural resources and the management of these resources. We invite all persons interested in these ideas to join the organization and to attend its conferences. Membership in the association includes a subscription to the journal *Natural Resource Modeling*. For additional information about the Association we invite you to visit our website at www.resourcemodeling.org or contact the President, Keith Criddle, at kcriddle@sfos.uaf.edu or the Executive Secretary, Rollie Lamberson, at Roland.Lamberson@humboldt.edu.

Thanks for Years of Service to RMA

At the RMA conference in Helsinki, Ken Lyon announced his resignation as treasurer of the Association. Ken was first appointed treasurer at the RMA meeting in 1996, and he has served in that role ever since. Over the years Ken has presented papers at almost every RMA conference since 1991. In 2001 he and Keith Criddle hosted the RMA conference at Logan, Utah.

Ken received his B.S. degree from Brigham Young University and his Ph.D. in Economics from the University of Chicago. Since 1966 he has been a member of the Department of Economics at Utah State University, teaching mostly graduate courses in the areas of Micro- and Macro-Economic Theory, Mathematical Economics, and Resource Economics. In 1982 he served as Research Scholar for the Forest Sector Study while on sabbatical at the International Institute of Applied Systems Analysis in Laxenburg, Austria. Ken retired from the faculty at Utah State on June 30 of this year.

Ken loves to ski, hike, bike and fish. He is a member of the Beaver Mountain Ski Patrol, and has spent a week each year for the last 15 years backpacking in the Wind River Mountains of Wyoming.

The officers and members of the RMA will miss Ken's knowledge and experience. He has been a pillar of the Association for many years, and we look forward to his continued participation in RMA.