RMA

The Resource Modeling Association is an international association of scientists working at the intersection of mathematical modeling, environmental science, and natural resource management. We formulate and analyze models to understand and inform the management of renewable and exhaustible resources. We are particularly concerned with the sustainable utilization of renewable resources and their vulnerability to anthropogenic and other disturbances.

RMA Newsletter Fall 2015

Flagstaff Conference by Bob Fray

When feasible the Resource Modeling Association holds its annual conference at locations where the natural resources motivate modelers to apply their knowledge to assist in the management of these resources. This will certainly be the case next summer when the conference will be held in Flagstaff, Arizona. The Southwest region of the United States is the most ecologically rich and diverse area of the country. In this area are several universities and research centers where scientists are working on resource management, many using quantitative methods to inform this endeavor.

The thirty-fourth annual meeting of the RMA will be held June 14–17, 2016 at the High Country Conference Center in Flagstaff. This center is a modern facility completely equipped with projectors, screens and interactive podiums. Free high-speed internet is available throughout the building. Several meeting rooms with comfortable seating will be available along with lounges and a large open reception area for coffee breaks and for the display of posters. The conference is connected to the conference hotel, the Drury Inn and Suites, and to a covered parking garage. Lunches will also be provided in the conference center.

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The theme of this year's conference is "Quantitative Modeling for Managing Natural Resources in an Era of Climate Change." Topics that will be addressed are water resource management, economic issues with managing natural resources, fisheries (fresh and salt water), biodiversity, wildlife management, forest management, and protection of ecosystems. Presentations concerning these topics and the effects of climate change on natural resources are invited from researchers working in these and related areas.

The following four keynote speakers will give talks on the use of mathematical models to study biodiversity and the management of natural resources in a sustainable manner. Hugh Possingham is the ARC Laureate Fellow in the Department of Mathematics and the School of Biological Sciences, The University of Queensland and Professor of Conservation Decisions, Imperial College London. By combining his knowledge of biology and mathematics, Professor Possingham has been a driving force in the field of decision science for conservation, and his research has helped to solve some of the world's biggest diversity conservation problems. His Marxan conservation planning software drove the rezoning of the Great Barrier Reef and is used in more than 100 countries and by the world's largest conservation NGO, The Nature Conservancy. He has coauthored over 500 papers indexed by the Web of Science. Graciela Ana Canziani is Professor of Mathematics, National University of Central Buenos Aires. Currently she is the Director of the Multidisciplinary Institute on Ecosystems and Sustainable Development. She has also been President of the Latin American Society of Mathematical Biology. She has worked on mathematical models to study aquatic ecosystems (oceanic plankton dynamics, management of neotropical wetlands, and monitoring of Pampas shallow lakes), as well as population models for analyzing the dynamics of the parasite *Ostertagia ostertagi* and its effect on livestock, and for understanding the reproductive success of *Rhea americana* in terms of dynamic energy budgets. Since 1996, Professor Canziani has been involved with the organization of workshops on Mathematical Ecology at the International Centre of Theoretical Physics in Trieste, Italy, as well as in Tanzania and Brazil, serving as Director. She has been a member of the ecoSERVICES Scientific Committee for DIVERSITAS and is currently lead author for Deliverable 3c of IPBES, "Methodological Assessment of Scenarios and Modelling of Biodiversity and Ecosystem Services." Jim Cushing is Professor of Mathematics at the University of Arizona. He is a Fellow of the American Mathematical Society and has been President of the International Society of Difference Equations. His research involves the derivation and analysis of mathematical models that describe population and evolutionary dynamics. Jim was a member of the "Beetle Team," an interdisciplinary group of researchers who explored phenomena predicted by nonlinear models using controlled laboratory experiments. He currently collaborates with Shandelle Henson in studying the effects of climate change on sea bird populations on Protection Island near Puget Sound. Jim is author of the book *Chaos in Ecology: Experimental Nonlinear Dynamics* and is also Editor-in-Chief of the *Journal of Biological Dynamics*. Shandelle M. Henson is Professor of Mathematics at Andrews University. As part of the "Beetle Team" at the University of Arizona, she used laboratory populations of *Tribolium* to test the theory of nonlinear dynamics in ecology. She and her husband,

J. L. Hayward, have established a long-running program that models the behavior of seabirds and marine mammals on Protection Island in the Strait of Juan de Fuca, Washington. In collaboration with J. M. Cushing, they currently are studying the effects of climate change on seabirds. Both of these research groups have been supported by grants from the National Science Foundation and have involved many undergraduate and graduate students. Shandelle and Jim will give an extended presentation about their joint work on Protection Island.

As is customary at RMA conferences, the program will be structured to promote extensive interaction among participants. The meeting rooms are of a size conducive to discussion, there are lounges and an abundance of foyer space. There will be morning and afternoon coffee breaks and lunches will be served in an area near the meeting rooms. Space for poster presentations will be made available in the foyer space. Again this year there will be awards for the outstanding presentations and posters by graduate students. Due to the informal nature and the fairly small size of the conference, this will be an ideal opportunity for young researchers to give talks about their initial projects. It will also be the case that graduate students who make presentations at the conference will be able to submit a brief statement about their research in the RMA Newsletter.

To further enhance the interaction among participants, there will be several social occasions for everyone. The evening before the opening of the conference, an opening reception will be held. This reception will be on Tuesday evening, June 14, at the historic Weatherford Hotel in downtown Flagstaff. Another social event will be the excursion to Grand Canyon National Park on Thursday, June 16.

The town of Flagstaff is home to Northern Arizona University, and it is also a resort town for the attractions in northern Arizona. Being both a university town and a resort makes it an ideal location for a small conference. There are many accommodations of varying prices, and there is an abundance of restaurants and brew pubs. The center of town is about half a mile from the conference center and the suggested accommodations. Therefore it will be convenient to join other participants for supper and an evening in a pub. As a result, there will be many occasions for social intermingling.

On Thursday afternoon, June 16, everyone will be transported by bus to the Grand Canyon National Park. When we arrive there will be a presentation by park scientists from the Science and Resource Management Center in the park about the work being done to manage the park resources. Much of the guiding research uses quantitative models. After the presentation, there will be free time to hike in the canyon or along the rim; biking is also available; free shuttle busses will take visitors to many locations in the park for sightseeing; and there are museums and shops for browsing and purchases. At the end of the afternoon the conference banquet will be held at a dining facility associated with one of the park lodges. After viewing the sunset at the rim of the canyon, the group will be bussed back to Flagstaff.

The town of Flagstaff and the surrounding area are popular tourist destinations due to the scenic beauty, the Native American culture, and the interesting attractions available.

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Bordeaux Conference 2015 Report

by Luc Doyen

The 2015 annual conference of the Resource Modeling Association was held at the University of Bordeaux in France from June 29 to July 1. It was successful from both the scientific and social viewpoints. First, the conference brought together numerous scientists and experts involved in the modeling for sustainability of biodiversity and ecosystem services. Second, the conference was also a great opportunity for sharing various social events and taking advantage of the city of Bordeaux and the Aquitaine region. The conference was a truly international and multidisciplinary event with more than 100 participants from about twenty countries and from numerous disciplines including ecology, economics, mathematics and computer science. The mix of senior and junior scientists was also part of the success. The various submissions for the special issue "Bordeaux 2015" of the journal *Natural Resource Modeling* also exemplify the positive outcomes of the meeting. Attendees will not forget this first French RMA meeting because of the exceptional weather accompanying the whole conference in the form of a rare heat wave for the region and for France. Climate warming likely at play!

The first event in relation to the RMA Bordeaux Conference 2015 was the summer school held near Bordeaux in the Castle of Cadillac, among vineyards, during the week preceding the conference. This third Summer School on "Ecology and Society: Biodiversity and global change," organized by the Cluster of Excellence COTE, offered an excellent opportunity for doctoral students to interact with specialists of biodiversity, in particular with Paul Armsworth, one of the keynote speakers of the RMA conference.

The first social event of the conference, on Sunday evening, was a welcome cocktail reception on the terrace of Le Café Français, a large bar-restaurant located on the corner of the famous Pey Berland Square, across from the cathedral. This cocktail party allowed participants and organizers to meet and interact in a pleasant environment and to take advantage of the summer time. The hot temperature was a good rationale to taste some Bordeaux wines.

The 2015 World Conference on Natural Resource Modeling was hosted by the University of Bordeaux at the Pey Berland campus. Such a location in downtown Bordeaux was convenient and pleasant for delegates, because both the historical part of Bordeaux and the main facilities were accessible within a few minutes. On Monday morning, opening remarks for the RMA conference were first delivered by myself, Antoine Kremer (director of LabEx COTE) and Marc-Alexandre Sénégas (director of GRETHA, the research center in economics of the University of Bordeaux). Richard Pearson, Lecturer at University College London and member of the Centre for Biodiversity and Environment Research was our first keynote speaker. In his talk entitled "Predicting the future of biodiversity," he discussed the role of ecological modeling in forecasting and managing biodiversity over the coming century, particularly in the context of climate change. He presented recent advances in modeling approaches, with a focus on methods that couple ecological niche models (species distribution models) with demographic models. He argued that conservation of biodiversity and ecosystem services over the twenty-first century will be advanced by more cross-disciplinary integration of models, including linking quantitative methods in ecology and economics.

Following the first invited lecture was the first of the sessions of contributed papers, each consisting of three parallel sessions. In these sessions time slots of 30 minutes were available to every speaker, which included 20 minutes for presentation of the paper by the speaker followed by 5 minutes of comments from a prescribed discussant and 5 minutes for exchanges with the floor. My view is that such a timing was a major driver of the scientific quality of the conference because it provided to every speaker enough time both for presenting his/her works and for exchanging with the audience. I was happy to see every speaker-discussant used this opportunity in a positive manner. The majority of the sessions on Monday were devoted to Ph.D. students, making it possible for all of them to relax for the rest of the conference and to be quickly identified by other scientists. Topics of the last contributed paper sessions on Monday were ecosystem models, offsets and risks management respectively.

On Monday evening, after the scientific presentations, delegates relaxed by tasting different Bordeaux wines. Antoine Pujol Dorey, a specialist of Bordeaux wines, used very illustrative slides to explain the history and the specificities of vineyards in the Gironde region, which is

the oldest vineyard for fine wines in the world. Antoine proposed four wines to the attendees: Château Mirebeau 2010 – Pessac-Léognan; Château Gombaude-Guillot 2004 – Pomerol; Château Meyre « Gallen » 2009 – Margaux; Château Tirecul La Gravière 2004 – Monbazillac. They were greatly appreciated and the mood was lively.

On Tuesday, the second day of the conference, Christopher Costello, Professor of Environmental and Resource Economics at UC Santa Barbara, USA, presented an outstanding plenary session entitled "An Interdisciplinary Framework for Spatial Bioeconomics." He proposed a mathematical framework for spatial bioeconomics that integrates principles from economics, ecology, and physics. The morning parallel sessions focused on ecosystems models (II), spatial modeling and governance. The friendly lunch, on the ground floor of the Pey-Berland campus, was especially dedicated to poster presentations. Tuesday afternoon, Quentin Grafton, Professor of Economics and Director of the Centre for Water Economics, Environment and Policy at the Crawford School of Economics and Government at the Australian National University, gave another stimulating plenary talk related to Risks, Resilience and Resource Management.

The conference banquet on Tuesday evening began on a boat starting from the famous Pont de Pierre and then bringing people along the river Garonne to view from the river both the historical center, the quays and the bridges of Bordeaux. The fresh air arising from the river and the Gironde Estuary, together with the aperitif proposed on board, were highly appreciated given the heat wave. During this outing on the Garonne the awards for the best student presentations were presented. After the boat trip, the delegates were welcomed to the conference dinner in a river-side restaurant Le Cafe Du Port. Specialities of the Aquitaine region such as Foie gras mi-cuit, a chutney de fruits de saison, Dos de cabillaud à l'unilatéral, soufflé de pommes de terre, crème de mâche, Magret de canard, dariole de polenta et caponata aux olives or Pavé au chocolat lemon curd, sorbet citron vert were offered on the menu together with Bordeaux wines.

Three parallel sessions devoted to ecosystem services, resilience-viability and structured dynamics opened the last day of the conference on Wednesday. At the end of the morning, Paul Armsworth Professor of Ecology and Evolutionary Biology at University of Tennessee, USA, addressed in a very stimulating way the following challenging question: "Ecological systems vary in space and time, but how much of that variation should policy recommendations respond to?" After lunch the conference concluded with parallel sessions, including a new session

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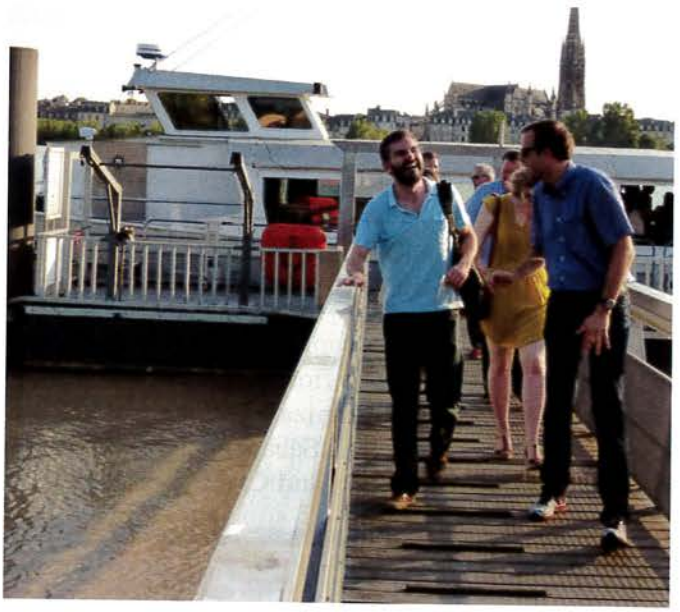


Bordeaux Conference *continued from previous page*

on invasive species, and a plenary session where RMA president John Hearne described the state of the Association, Catherine Roberts gave an update on the journal *Natural Resource Modeling*, and Bob Fray and Catherine gave a presentation on the 2016 RMA meeting in Flagstaff, AZ.

Key to the success of any conference is the work behind the scenes, with tireless efforts from local scientists, administrative staff and organization. In that respect, Julie Vissaguet, Florian Bachoffer, Sébastien Lavaud, Lauriane Mouysset, Pierre Yves Hardy, and Camille Poiraux deserve special acknowledgements. At the local level, the support from the GREThA and especially from its vice-head Jean-Christophe Pereau was decisive. The University of Bordeaux, the CNRS (Centre National Recherche Scientifique) and French Laboratory of Excellence (LabEx) COTE brought also a crucial support. At the national scale, the ANR, the French national agency for funding research, played a major financial role. Although the RMA Bordeaux conference 2015 has not solved all the scientific challenges underlying the modeling for the management and sustainability of biodiversity and ecosystems services, I am convinced that it gave important insights into these issues and sowed many seeds in that respect.

PRESIDENT'S COLUMN

by John Hearne

A warm welcome to the many new members of the RMA especially those who participated in their first World Conference on Natural Resource Modelling in Bordeaux earlier this year. It was wonderful to see so many Ph.D. students and early-career researchers active at the conference. The diversity of projects and techniques presented at the conference highlighted what a vibrant field we work in. There will be a report elsewhere on the conference but I would just like to congratulate all the presenters, from the invited plenary speakers to the student talks, on the high standard which, with the splendid organisation, made the conference a great success.

We promised in the last newsletter to enhance the value of being a member of the RMA. While this is still a work in progress we do now have a more modern website. And elsewhere in this newsletter you will find details of the prestigious Rollie Lamberson Research Award. This is a new initiative of the RMA and will recognise an outstanding published contribution of a member.

The friendly and interdisciplinary nature of our annual conferences is one of the core attractions of RMA membership. The preparations for another fantastic conference are well under way, and I hope many of our new members, especially, will be able to join us in Flagstaff in June next year. If you are unable to attend that conference start planning now to join us in Barcelona in 2017.

Happy modelling.

Editor's Column

by Catherine A. Roberts
Editor of Natural Resource Modeling

Our journal, *Natural Resource Modeling*, has done it again! Our 2014 Impact Factor continues to rise, this time to 1.196. I can't emphasize enough how helpful and important it is for you to promote our journal – make researchers aware of it, encourage your colleagues to submit papers, and reference articles we publish whenever appropriate. If you are at a meeting and hear of research that seems appropriate, please reach out to the speakers and make sure they are aware of our journal. Let them know that early-career scientists who identify themselves to me will enjoy extra support (more detailed referee reports, assistance on editing) to help them launch their careers.

A Special Issue on Eco-Evolutionary Dynamics, edited by Shandelle Henson, Jim Cushing, and Jim Hayward will close our 28th volume. In their introduction, in which they point to Pelletier, F., Garant, D., and Hendry, A.P. 2009. Eco-evolutionary dynamics. Philos Trans R Soc Lond B Biol Sci. 364: 1483–1489. doi:10.1098/rstb.2009.0027, the editors state:

It is only recently that evolutionary biologists have developed techniques to measure selection, fitness and genetic variance for fitness-related traits in wild populations. Application of these and other techniques, together with laboratory experiments, have fostered the emerging field of eco-evolutionary dynamics under the realization that ecological and microevolutionary processes can occur on the same time scale, that important feedbacks couple these processes together, and that Darwin's "daily and hourly scrutinizing" can be directly perceived.

We thank editor Graciela Canziani for her service. After the New Year, we will thank some long-serving editors for their tremendous dedication to the journal and announce some new additions to help us address growing submissions in emerging scientific areas.

If you are involved in organizing events at your home disciplinary meetings, please work with me to ensure that we are bringing our journal to the attention of your professional community.

Some questions have been brought to me about membership in the society. Membership in the Resource Modeling Association includes expedited reviews of manuscripts you submit to our journal. It also includes online access to our journal. If you do not know how to access this, please send an email request to Gayle Scaramozza, Membership Services Specialist, gscaramo@wiley.com. We have a new managing editor at Wiley named Golda Thomas and are looking forward to our continued relationship with our publishing house.

I am looking forward to seeing many of you at the 2016 World Conference on Natural Resource Modeling in Flagstaff, Arizona next summer. As usual, the journal will sponsor prizes for student talks and posters. Please encourage your students to join us! Shandelle Henson and I will also be running a special session at the Joint Mathematics Meetings in Seattle, Washington on January 8, 2016. If you are in the area, contact me for additional information, including an invitation to join the speakers for lunch.

Election of Officers

The RMA members have chosen **Luc Doyen** as president-elect of the Association. Luc will succeed our current president, John Hearne, as president at the conclusion of the RMA conference in June 2016.

As many of you know, Luc hosted the 2015 World Conference on Natural Resource Modeling at the University of Bordeaux. (See the article that he authored on page 4 about the meeting.) He did a splendid job, and, as a result, he gets the responsibility of guiding the organization for the next two years.

Luc is currently the Director of Research at the CNRS (Centre National de la Recherché Scientifique) and a director at GREThA, a joint research institute associating the University of Bordeaux and CNRS.

This latter affiliation came after ten years in a laboratory dedicated to ecology and conservation biology at the Museum of Natural History in Paris. He is an author of the book *Sustainable Management of Natural Resources, Mathematical Models and Methods* and over fifty research papers which emphasize the connection between the applied and theoretical dimensions of his interdisciplinary research in the areas of ecology, environmental economics and modeling. His applied work has been in the management of agriculture, fisheries and biodiversity. He organized a quarterly thematic program in the Institut Henri Poincare titled "Mathematics of Bioeconomics" in the framework of the international event Mathematics of Planet Earth 2013.

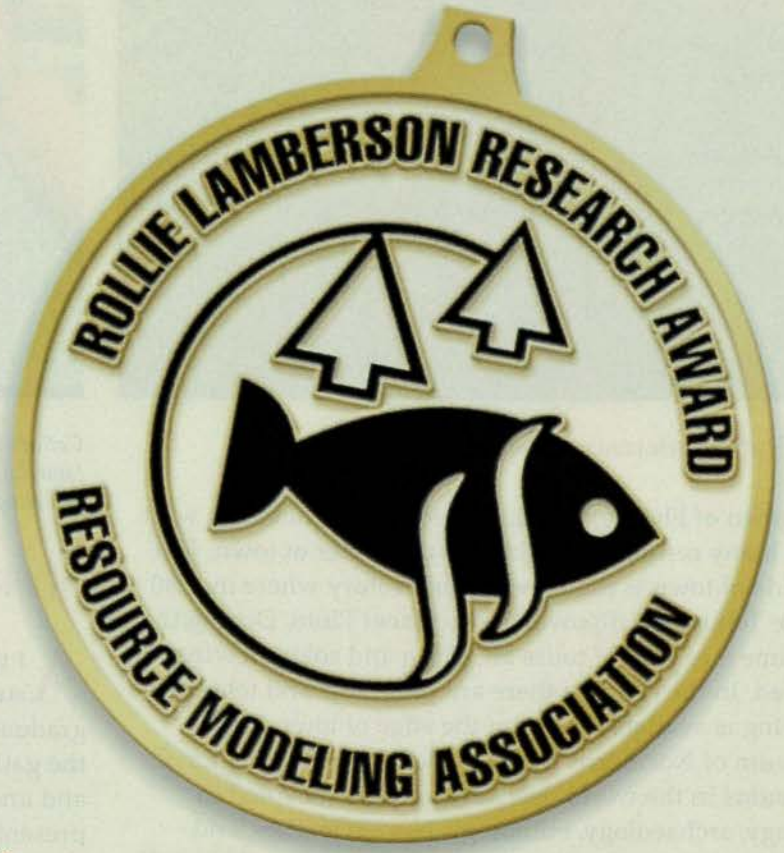
Harry Gorfine was selected by the members of the RMA to join the Board of Directors of the Association. As is the case with Luc, Harry also organized a highly successful international conference of the Resource Modeling Association, this one in July 2014 at the Vilnius University in Lithuania. Recently Harry has overseen the development of a new website for our organization. This is a very dynamic and attractive site, and Harry has continued to take the responsibility of maintaining it.

Harry is a Senior Marine Research Scientist with the Fisheries Management and Science Branch of Fisheries Victoria, a division of the Victorian Department of Environment and Primary Industries in Australia. In addition he holds associate positions with the University of Melbourne and RMIT University. During the Australian winter he collaborates with the researchers at the Lithuanian Research Centre.

His primary area of expertise is assessing the sustainability of commercial dive fisheries. For more than two decades he has been conducting research assessing the resource status for commercial dive fisheries targeting shellfish including abalone, sea urchins and scallops. He has also been involved in electronic data acquisition of fishery dependent data using a variety of logging devices deployed during underwater harvesting operations.

Harry's work in assessing the status of shellfish resources has brought him in contact with various stakeholder groups, which has proved challenging at times. It is particularly challenging when financial conditions are difficult and the supply of shellfish is low. He states that, "...resource management is more about modification of human behavior than it is about any direct control over the dynamics of a target species."

Rollie Lamberson Award



The Resource Modeling Association's annual Rollie Lamberson Award will be announced for the first time in 2016. The award is given for the most outstanding paper in natural resource modeling of the previous two years authored by an RMA member. This award has been established to recognize the contribution of Professor Roland (Rollie) Lamberson to the growth of the RMA and its journal *Natural Resource Modeling*. Rollie is a founder of the Resource Modeling Association and has served as the founding President and the Executive Secretary, receiving an Award for Distinguished Service from the association in 1991. He has also contributed substantially to the *Natural Resource Modeling* journal, acting as Managing Editor 1985–1991, and editing numerous special issues, and still serves on NRM's Senior Advisory Council.

All papers published in *Natural Resource Modeling* within the past two calendar years, with at least one current RMA member as an author, will automatically be considered for the award. Papers published in other journals by current RMA members may also be nominated for consideration, by submission of an electronic copy of the paper in English along with a nominating letter detailing why the paper merits the Rollie Lamberson Award.

The award recipients will be decided by an awards committee comprising representatives from the RMA board of directors and the editorial board of *Natural Resource Modeling*. The committee members and the RMA president are ineligible for the award. The award-winning paper will be the one most consistent with the RMA's goals of advancing modeling excellence to transcend divides among natural resources disciplines, and will have broad reach and implications for the natural resource modeling community. Detailed criteria for the award are given at http://resourcemodeling.org/awards/.

The authors of the winning paper will each receive the Rollie Lamberson Medal. In addition, one author will be invited to deliver the Rollie Lamberson Award talk in a plenary session of the RMA conference, including subsidized attendance at the conference. The inaugural award will be announced next year, so watch this space.

Flagstaff Conference *continued from page 3*

The town of Flagstaff gives the feel of the American west with many restored buildings in the center of town. Just outside of town is the Lowell Observatory where in 1930 Clyde Tombaugh discovered the planet Pluto. During the daytime a variety of tours are given and solar viewing is offered. In the evening there are programs and telescope viewing is available. Also on the edge of town is the Museum of Northern Arizona, one of the great regional museums in the world. Here are galleries devoted to geology, archaeology, ethnology, Navajo textiles, and ceramics and jewelry from Southwestern tribes. Flagstaff is surrounded by the largest contiguous Ponderosa pine forest in the world and the San Francisco Peaks rise nearby. This provides a wonderful area for hiking, mountain biking and horseback riding. Close to town is Walnut Canyon National Monument where you can walk through the cliff dwellings and pueblos that were the homes to the natives 800 years ago. Also nearby is the town of Sedona, an artist colony, which is surrounded by the beautiful Red Rock country. A fascinating way to see this area is to take one of the four-wheel drive tours of the region. If there is sufficient interest, a tour or two of the attractions in the vicinity of Flagstaff can be arranged.

Start planning now to attend the World Conference on Natural Resource Modeling in June 2016 and spend some time visiting the sights of the American Southwest. The elevation of Flagstaff (7000 feet or 2134 meters) and its low humidity make it a very pleasant place in June. All of the attributes that have been described also make Flagstaff a very popular tourist destination, and the middle of June is high season, so it is advisable to make plans early to attend the conference. Come, bring your family, spend some time, and have a truly memorable visit.

Catherine Roberts and the student award winners: (standing, left-right) Martin Hansel, Vanessa Trijoulet, Benoit Othoniel (kneeling) Adam Clark, Theophile Lohier

Student Award Winners

At the RMA conference in Bordeaux this past summer there was a large and active contingent of graduate students which added considerable vitality to the gathering. Fifteen of these students presented talks and another five offered poster presentations. Student presentations are always an important part of these conferences, but this time it was especially true.

Four of the students received a 200€ award for their talks. Adam Clark from the University of Minnesota, USA, spoke on "Predicting communities from monocultures: How to maximize desired goods and services with available ecological information." Theophile Lohier from IRSTEA in Aubiere, France presented "Simplification of a mechanistic individual-based model of plant community dynamics using a stochastic modelling framework." Benoit Othoniel from the Luxembourg Institute of Science and Technology talked about "The use of ecosystem services integrated modelling in LCA." Vanessa Trijoulet from the University of Strathclyde in Glasgow, Scotland spoke on "Bioeconomic models of grey seal predation impacts on West of Scotland demersal fisheries."

Martin Hansel received a 100€ award for his poster presentation on Intertemporal Distribution of Well-being in a Dynamic Integrated Model of Climate and Energy.

Further discussion of the research by Vanessa and Adam is on the next page. Similar awards will be given for graduate student presentations at the meeting next summer in Flagstaff, Arizona. So make your plans to attend and present the results of your research.

Student Research Statements

Adam Clark

University of Minnesota
Adam.clark@gmail.com

I am a PhD student working under Dr. David Tilman in the University of Minnesota's Department of Ecology, Evolution, and Behavior. I am broadly interested in how ecological communities persist across space and time. To me, the defining characteristic of ecological communities is that they self-assemble, and that they maintain themselves across large spatial and temporal scales even when faced with perturbations and disturbance. I find this fascinating because it suggests that predictive understanding of community ecology could help us engineer ecological communities that provide particular desired goods and services but are able to maintain themselves with minimal inputs.

My main focus is on synthesizing existing data and theory (of which there is a lot) in order to build predictive models of community assembly for real-world systems, which remains an elusive goal in ecology. I work predominantly at the Cedar Creek Long Term Ecological Research Site. My thesis work seeks to explain how interactions among prairie plant species and their environments influence ecosystem properties. I am especially interested in trying to understand how these interactions can be harnessed to produce ecosystems with particular desired properties, such as high production of biomass and retention of soil nitrogen and carbon.

Éloïse Comte

University of LaRochelle
eloise.comte@univolr.fr

My name is Éloïse Comte and I'm a second year PhD student at the University of La Rochelle, France. My presentation at the RMA's meeting was focused on spatial-structured optimal control of pollution by nitrogen fertilizers. The main goal is to find an optimal tradeoff between nitrogen fertilizers used for agricultural crops, taking into account depollution costs. Our viewpoint is to use a realistic model for the transport of the pollutant in the underground. The key point of the problem is its spatial structure because agricultural fields and pumping wells are not localized at the same place. Moreover they may be separated by an inactive buffer zone for which we characterize the optimal size. One of the purposes of this work is to consider homogeneous pollution policies in order to compare results with space structured policies.

Emeline Hily

University of Lorraine
emeline.hily@nancy.inra.fr

I am currently working at the Laboratory of Forest Economics (INRA) in Nancy, France, as a PhD candidate. My work focuses on the definition of payments for biodiversity conservation while accounting for spatial and dynamic aspects of the conservation problem (i.e., dynamics and spatial aspects of production activities and ecological processes). I develop theoretical models whose motivations and set-up are discussed in an interdisciplinary manner in collaboration with ecologists and economists.

In my recent work, I built on the conclusion of the last report of the state of Nature in the EU and investigated the possibility to define cost-effective incentive species-specific payments for biodiversity conservation in a landscape when not only the provision of suitable habitat to the species matters but also target species' population occurrence should be accounted for. I developed a common-value principal-agent model in which a planner wishes to conserve a target-species while both conservation cost and species' presence or absence within a property belongs to landowners' private information. I demonstrate the possibility to define differentiated conservation payments in this context. The degree of contracts differentiation highly depends on species' rarity, level of opportunity cost of conservation as well as on the additionality of species-specific protection in the landscape. This work makes a noticeable contribution by giving insights into the definition of conservation payments while considering more realistic assumptions and accounting for the multidimensionality of asymmetric information.

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Statements *continued from previous page*

Vanessa Trijoulet
University of Strathclyde
Vanessa.trijoulet@strath.ac.uk

The decline in high value commercial fish in the North Atlantic and the simultaneous increase in the grey seal population has created a controversy between fishers and conservationists regarding the role that grey seals may have played in the stock depletion. Considering the weight of fish consumed by grey seals is not sufficient to gain insight about the economic impacts of seals on the fisheries. To our knowledge, the bioeconomic impact of grey seal predation on fisheries has never been examined in the UK. Therefore, I have developed bioeconomic models to quantify the economic impact of grey seal predation on the mixed demersal fisheries for cod, haddock and whiting in the West of Scotland. Considering grey seal predation in a population model allowed a better assessment of the fish natural mortality due to seal predation. An age-structured model including seal predation was created and linked to an economic model estimating fishing revenues and costs. The models also include a multifleet component to represent the current organization of the West of Scotland fisheries for demersal fish as closely as possible. Three bioeconomic models are tested at different equilibria and for different fisheries management strategies to investigate grey seal impacts on the West of Scotland fisheries in different scenarios.

RMA Membership

All members who have supplied an email receive the first renewal notice via email, which includes a link to the online renewal page. The second renewal notice is printed and mailed, the 3rd notice is emailed. This is the link to the main ordering page: http://ordering.onlinelibrary.wiley.com/membership.asp?ref=1939-7445&doi=10.0111/(ISSN)1939-7445. The link provided in the renewal emails goes directly to the order form for the type of membership and should list the correct rate.

Due to data security guidelines, Wiley no longer includes the credit card payment box on the printed renewal forms and therefore we encourage the members to renew online or to contact us by phone. Online credit card payments are accepted globally. We do accept VISA, MasterCard and AMEX but not PayPal.

If you have any questions about your membership, feel free to contact:

Gayle Scaramozza, Membership Services Specialist
Wiley Publishing Global Operations
350 Main St., Malden, MA 02148 USA
T- 781.388.8425
gscaramo@wiley.com

RMA MEMBERSHIP INCLUDES:

- Subscription to the journal *Natural Resource Modeling* (NRM)
- RMA Newsletter
- Reduced registration fee for the annual conference
- Eligibility for the Rollie Lamberson Award
- A 25% discount on all Wiley and Wiley-Blackwell product lines

RMA

The official newsletter of the Resource Modeling Association

Bob Fray, editor
bob.fray@furman.edu

Mathematics Department
Furman University
3300 Poinsett Highway
Greenville, South Carolina 29613