





Ruta 10 km 86, Parada 21 al fondo
Bella Vista, Maldonado - Uruguay
Email: info@saras-institute.org
Website: www.saras-insitute.org

Institute & Foundation

The SARAS² Institute is a joint initiative of Wageningen University (Netherlands), the University of the Republic (UdelaR, Uruguay), the Resilience Alliance, the Education and Culture Ministry of Uruguay (Uruguay), and the Maldonado Department (Uruguay).

Through the advisory board the Institute has strong linkages with: the Beijer Institute of Ecological Economics (Sweden), the Stockholm Resilience Center (Sweden), the University of Wisconsin (USA), Arizona State University (USA), the University of Waterloo (Canada), the Catholic University of Chile (CASEB, Chile), the Patagonic National Center CONICET (Argentina), the University of Brasilia (Brazil), and the Doñana Biological Station-CSIC (Spain).

The South American Institute for Resilience and Sustainability Studies (SARAS²) is an emerging transdisciplinary institute designed to generate critical insights allowing South America to build sustainable futures. It seeks integration across a broad range of knowledge using innovative approaches and integrating social and natural sciences, mathematics and arts.

SARAS² will be housed in a custom designed building currently being constructed at the coast of Uruguay providing space and facilities for workshops, courses and academic residencies, thus serving as a hub for the emergence of novel cooperative networks. We envision the kind and intense interaction at SARAS to shape a new generation of broad visionary thinkers and creators.

The idea of SARAS² Institute was conceived in 2005 between Marten Scheffer and Néstor Mazzeo. In January 2006, a first document was drafted and at the same time, Mayor of Maldonado Oscar De los Santos was approached in order to explore the possibility of establishing SARAS Institute in that department. With the strong support of the Municipality, a search for a suitable location started. Since the summer of 2007 the Advisory Board of SARAS² began

meeting regularly to discuss guidelines and redefine the Institute's main features, targets and goals.

The Institute's academic life began between 2008 and 2009 with various scientific publications and several research projects presented at national and international level. In connection with the approved projects, a five year programme of annual conferences on relevant topics in Latin America was established. The cycle of annual conferences started in 2010 with the topic Sustainable Future of Water Resources in Latin America. In 2009 SARAS² was granted a substantial support from the University of the Republic (UdelaR). Thank to this contributions, Mariana Meerhoff joined the work team. There was also financial backing from the Ministry of Education and Culture. In 2011 additional support from the Municipality of Maldonado was approved.

In December 2012 SARAS² was established as a foundation in order to resolve the legal and administrative format of management. At present, the Ministry of Education and Culture, UdelaR and the Municipality of Maldonado provide the main financial support.

One of this year's milestones was the

beginning of the first phase of SARAS building at Bella Vista. Another more intangible but yet key structural input has been the development of a new portrait of SARAS² through the design of a new website.

The advisory board is integrated by: Marten Scheffer, Jordi Bascompte, Laurie Beth Clark, Steve Carpenter, Omar Defeo, Carl Folke, Pablo Marquet, Osvaldo Sala, Ana Parma, Eduardo Viola, Frances Westley and Mariana Meerhoff.

The Scientific Director is Néstor Mazzeo. The Executive Committee is integrated by: Marten Scheffer, Osvaldo Sala, Ana Dubra, Néstor Mazzeo, Mariana Meerhoff, Paula Bianchi, Cecilia Delgado, William

Rodríguez and Mariella Busnadiego.

The Administrative Board of the SARAS² Foundation involves: Néstor Mazzeo (UdelaR representative), Omar Defeo (UdelaR representative), Osvaldo Sala (Advisory Board representative), Mariana Meerhoff (Advisory Board representative), Ricardo Pereira (Maldonado representative), Virginia Fernández (MEC representative) and Matías Arim (Scientific members representative).

Finally, the Fiscal Board of the SARAS² Foundation involves: Lujan Criado (UdelaR representative), Gustavo Morales (Udelar representative) and Julio Riella (Maldonado government representative).

Scientific activities

For the last five years there has led a series of scientific conferences:

-
- 2010** Continental aquatic resources
 - 2011** Artisanal fisheries
 - 2012** Transitions in terrestrial ecosystems
 - 2013** Education for uncertainty
 - 2014** Imagining resilience: Art-science collaboration for sustainability
-

Networks

SARAS² can be considered a net of networks. The networks are organized about specific topics independently of the disciplinary background of the researchers.

National level

SARAS² has been working on a project proposal in collaboration with the National Directorate on Land Organization (DINOT) and the Departmental Government of Maldonado. The work involves an economic study of the alternative scenarios that could be developed at the Laguna del Sauce basin. This project will have three main components: (i) scenario analysis carried out in collaboration with two ecological economists of the Economics Institute of the University of the Republic about the alternative scenarios in Laguna del Sauce basin; (ii) synthesis of previous scientific and technical contributions directly related to land planning; and (iii) a governance analysis of the national-local interactions and decision-making processes underlying the future restructuring of the use/regulations of Laguna del Sauce's basin. SARAS will facilitate and coordinate the project, and will focus on the work related to

the second and third components.

The network related to aquatic ecosystems studies also contributes with the elaboration of a rehabilitation strategy for recovering ecosystems services from artificial lakes located in the Canelones Council, an initiative promoted by the Departmental Government of Canelones. In March 2014 the complete report will be published.

In November 2014, SARAS² co-coordinated the workshop on "Agriculture intensification and superficial water quality in Uruguay", together with the National Directorate of Environment (DINAMA) of the Environment Ministry, the School of Sciences (UdelaR), and supported by the Directorate of Science and Technology (DICYT) of the Ministry of Education, and Culture and the National and Agency of Research and Innovation (ANII). Four professors of the University of Aarhus (Denmark) worked during three days in close

collaboration with 60 professionals and practitioners of all Uruguayan state institutions related to water quality and management.

In December 2014, SARAS² coordinated a workshop entitled "Robust spatial design of a national monitoring program, on aquatic ecosystems in Uruguay", with the collaboration of Dr. José Barquin (Cantabria University-Spain) and the participation of representatives of the main ministries and agencies related to aquatic resources.

Nowadays, SARAS²'s researchers together with the Ministry of Agriculture from Uruguay, the Stockholm Resilience Center and some academic institutions from Argentina and USA are defining a cooperation program related to the quantification and implementation alternatives of the adaptation and resilience capacity of cattle production farmers in the context of new scenarios of climatic variability.

Regional context

At the local and regional level, SARAS² has been closely engaged in the launching and implementation of the Regional Center for Climate Change and Decision-making coordinated by UNESCO-AVINA and a regional network of universities and institutes.

In November 2014 the first national workshop on Vulnerability, adaptation and resilience of small cattle producers to current and future scenarios. This workshop was co-coordinated by SARAS and the Center on Climate Change and Decision-making (UNESCO-AVINA). The national workshop sought to improve the connection between policymakers, farmers and the research community. A book with the main result will be published during 2015.

Regional context

In May, SARAS² participated at the Sustainability in the Water – Energy – Food Nexus, Bonn, Germany <http://wef-conference.gwsp.org/programme/programme.html>

Related to this activity and the previous one described at the regional level, SARAS² took part of two initiatives submitted to the 2014 Future Earth's call.

In August 2014, the Vice president of the US National Academy of Sciences had an official visit to Uruguay aimed at exploring and strengthening the scientific collaboration between the two countries. SARAS² elaborated a proposal with some key areas in which collaboration with US partners could and should be sought. As a follow up of that meeting SARAS² is now working with the Ministry of Education and Culture on the following research topics:

1. Early warning signals in complex systems
2. Managing complex social-ecological systems: the case of fisheries
3. Abrupt grass-woodland transitions: determinants and consequences for ecosystem services
4. Interaction of human impacts on freshwater ecosystems, with focus on climate change and land use
5. Futures of South America: scenario planning in climate-land use changes and sustainability

Training programs

Postgraduate courses

Second Course-Workshop Water-City interactions: arroyo Maldonado. 13-18 March 2014, University Center of the East Region (CURE), University of the Republic (UdelaR)

Socio-ecological systems: structure, dynamics and governance. Coordinated by Isabel Bortagaray and Néstor Mazzeo. First edition March 2015.

PhD thesis

Rafael Bernardi. 2012-2015. Grassland-forest transitions in subtropical South America. Supervised by: Dr. Milena Holmgren, Dr. Marten Scheffer and Dr. Matías Arim.

Postdocs

Carolina Crisci. 2013-2015. Implications of climatic variability on water quality of Laguna del Sauce. Supervised by: Dr. Rafael Terra & Dr. Néstor Mazzeo.

Outreach

The SARAS² Institute is frequently asked to participate in the study of relevant issues related to socio-ecological systems management, which is particularly conspicuous in Uruguay (at local and national levels). Some of the researches had been selected because they are representative of Institute's main research topics.

Understanding and management of multi-dimensionality and uncertainty.

June 2014, Office of Planning and Budget, Executive Tower, Montevideo.

Towards adaptative management of Laguna del Sauce. June 5th, 2014 – International Environment Day, University Center of the East Region (CURE), UdelaR, Maldonado, Uruguay

Possible approaches for the management of socio-ecological systems. June 5th, 2014 – International Environment Day. Ateneo- Montevideo.

Main opportunities for environmental management. September, 2014, University Center of the East Region (CURE), UdelaR, Maldonado, Uruguay

Co-coordination of a workshop on Science as a driver of new businesses. September, 2014. Workshop co-coordinated by IDEAR (Business Incubator located in Maldonado), together with SARAS, CURE, BIOESPINN of the Pasteur Institute of Montevideo, and the network of Support to Future Entrepreneurs (RAFE) of the National Agency of Research and Innovation (ANII). With the support of the Municipal Government of Maldonado. School of Medicine CLAEH-Maldonado, ORT University, the National Agricultural Research Institute (INIA), the Uruguayan Association of Biotechnology (AUDEBIO)

and the Sciences School (UdelaR).

It aimed at discussing about new factors and aspects that should be included and valued as research outputs and outcomes. It focused on highly innovative initiatives on human and animal health, environment, agrosciences and bio-informatics. The National Agency on Research and Innovation (ANII) introduced their program portfolio to support innovative businesses.

Submission of the metropolitan region Punta del Este – San Carlos – Maldonado to the call for 100 Resilient Cities of the Rockefeller Foundation (<http://www.100resilientcities.org/>). The proposal was jointly prepared by SARAS and the Departmental Government of Maldonado. September 2014.

SARAS² Award for the Sustainability and Resilience, National Fair of Science Clubs 2014, organized by the National Directorate of Science and Technology (DICYT) of the Ministry of Education and Culture.

Why are environmental problems so persistent? The role of the resilience and transformation process.

December 5th. TEDx Punta del Este.

Publications 2009-2015

SCIENTIFIC PAPERS

2009

Early-warning signals for critical transitions. *Nature* 416(3)53-59.

Marten Scheffer, Jordi Bascompte, William A. Brock, Victor Brovkin, Stephen R. Carpenter, Vasilis Dakos, Hermann Held, Egbert H. van Nes, Max Rietkerk & George Sugihara.

2012

Anticipating Critical Transitions. *Science* 338: 344:348.

Marten Scheffer, Stephen R. Carpenter, Timothy M. Lenton, Jordi Bascompte, William Brock, Vasilis Dakos, Johan van de Koppel, Ingrid A. van de Leemput, Simon A. Levin, Egbert H. van Nes, Mercedes Pascual & John Vandermeer.

Environmental warming in shallow lakes: a review of potential changes in community structure as evidenced from space-for-time substitution approaches. *Advances in Ecological Research* 46: 259-349.

Mariana Meerhoff, Franco Teixeira-de Mello, Carla Kruk, Cecilia Alonso, Iván González-Bergonzoni, Juan Pablo Pacheco, Gissell Lacerot, Matías Arim, Meryem Beklioglu, Sandra Brucet, Guillermo Goyenola, Carlos Iglesias, Néstor Mazzeo, Sarian Kosten & Erik Jeppesen.

Biomanipulation as a restoration tool to combat eutrophication: recent advances and future challenges. *Advances in Ecological Research* 47: 411-488.

Erik Jeppesen, Martin Søndergaard, Torben L. Lauridsen, Thomas A. Davidson, Zhengwen Liu, Néstor Mazzeo, Carolina Trochine, Korhan Özkan, Henning S. Jensen, Dennis Trolle, Fernando Starling, Xavier Lazzaro, Liselotte S. Johansson, Rikke Bjerring, Lone Liboriussen, Søren E. Larsen, Frank Landkildehus, Sara Egemose, & Mariana Meerhoff.

Governance and governability of coastal shellfisheries in Latin America and the Caribbean: multi-scale emerging models and effects of globalization and climate change. *Current Opinion in Environmental Sustainability* 4: 344-350.

Defeo O., Castilla J.C.

2013

Co-management in Latin American small-scale shellfisheries: assessment from long-term case studies. *Fish and Fisheries*: DOI: 10.1111/faf.12101.

Defeo O., Castrejón M., Pérez-Castañeda R., Castilla J.C., Gutiérrez N.L., Essington T.E., Folke C.

Impacts of climate variability on Latin American small-scale fisheries. *Ecology and Society* 18 (4): 30.

Defeo O., Castrejón M., Ortega L., Kuhn A., Gutiérrez N.L., Castilla J.C.

2014

A special feature of the *Journal of Ecology* has been published in November synthesizing the results of the 2012 SARAS workshop: **Grass-woodland transitions: determinants and consequences for ecosystem functioning and provisioning of services**, edited by Osvaldo E. Sala, and Fernando T. Maestre. Published online on October 24, 2014. This SARAS effort has been featured in numerous outlets in Uruguay. For example, it showed up in the magazine *Búsqueda* http://www.busqueda.com.uy/mailling/notas/1790/nota_ambiente/ and in the web site of the Municipality of Maldonado <http://www.maldonado.gub.uy/?n=16435>.

The results of a SARAS study is highlighted at the Programa de Divulgación Científica y Técnica of the Leloir Foundation on the **“Pronostican “sabanización” de América del Sur”** <http://www.agenciacyta.org.ar/2014/12/pronostican-“sabanizacion”-de-america-del-sur/> December 3rd

The forgotten half of scientific thinking. Opinion. **PNAS**. Vol.111 (17): 6119. April 29.

Marten Scheffer

BOOKS & CHAPTERS

2010

Book: **“Bases técnicas para el manejo integrado de Laguna del Sauce y cuenca asociada”**.

Carlos Acuña, Ricardo Alcorta, Marcelo Caffera, Carmela Carballo, Juan Clemente, Carolina Crisci, Laura del Puerto, Felipe García-Rodríguez, Hugo Fort, Claudia Fosalba, Soledad García, Iván González-Bergozoni, Guillermo Goyenola, Jorge Hourcade, Carlos Iglesias, Higo Inda, Erik Jeppesen, Susana Kausas, Alejandra Kröger, Juan José Lagomarsino, Diego Larrea, Eleonora Leicht, Néstor Mazzeo Beyhaut, Nicolás Marchand, Soledad Marroni, Malvina Masdeu, Mariana Meerhoff, Gustavo Méndez, Juan Pablo Pacheco, Valeria Pérez Güida, Marten Scheffer, José Sciandro, Manfred Steffen, Adriana Rodríguez, Franco Teixeira de Mello, Mariana Vianna and Nicolás Vidal.

2013

Book chapter: **“Capacidad de adaptación y transformación en un clima de cambios”**, in *Clima de Cambios: Nuevos Desafíos de Adaptación en Uruguay*, Walter Oyhantcabal, Diego Sancho and Malvina Galván (eds.). Chapter 6: 273-284, FAO.

Néstor Mazzeo, Hugo Inda, Javier Taks, Rafael Terra, Mario Bidegain and Carolina Crisci.

Book chapter: **“Variabilidad climática de importancia para el sector productivo”**, in: *Clima de cambios, nuevos desafíos de adaptación en Uruguay*, Walter Oyhantcabal, Diego Sancho and Malvina Galván (eds.). Chapter 2: 43-99, FAO.

Mario Bidegain, Carolina Crisci, Laura del Puerto, Hugo Inda, Néstor Mazzeo, Javier Taks & Rafael Terra.

2014

Book: **“Ambiente”**. Serie Nuestro Tiempo, MEC. Mariana Meerhoff y Walter Oyhantcabal.

Future projects

SARAS² aims at contributing to develop a national program of monitoring and control of surface fresh waters and to strengthening water management governance, through a variety of projects and initiatives.

Rural landscape planning and ecosystem services conservation

SARAS² is working together with the Maldonado authorities, DINOT (National Division of Land Planning of Uruguay), Maldonado Council, Economy Faculty (UdelaR) and Laguna del Sauce Basin Committee about possible strategies of rural planning in order to preserve relevant ecosystem services (mainly drinking water supply). The main idea is to develop an adaptive management approach, probably the first example in rural land planning of Uruguay.

Contribution to a Water Sustainability program in Uruguay: the GLEON network

Funding: US Embassy Science Fellows Program.

This project supports the stay in Uruguay of a high rank staff of the EPA (US Government) who will participate with SARAS² in three main activities: incorporation of Uruguay to the international research and monitoring network GLEON (Global Lake Ecological

Observatory Network); bringing in the US experience in developing a national monitoring program of ecological status; and strengthening local capacities by training postgraduate level human resources (through PhD and MSc intensive courses).

Advanced proposal: Strategies to mitigate agricultural effects on fresh waters

Via cooperation with Aarhus University of Denmark. Involved institutions: MVOTMA, MGAO, MEC.

This cooperation, facilitated by SARAS² and UdelaR, aims at translating to Uruguay some of the lessons learnt during a very successful history of recovery of the quality of surface waters through a combination of mitigation strategies and national policies applied in the last 30 years in Denmark. A cooperation agreement already exists between UdelaR and Aarhus University regarding education programs, and we aim at incorporating management and policy exchange.

Advanced proposal: **National monitoring program of aquatic ecosystems.**

SARAS², Cantabria University (Spain), UdelaR and network of Ministries of Uruguay related to aquatic resource management, are working for developing a national monitoring program of aquatic resources based on synthetic network paradigm and considering the decentralization process of the country.

Proposal: **Water Sustainability in Uruguay: Scenarios thinking for the Santa Lucía watershed**

Potentially involving MVOTMA, MGAP, Municipalities in the Santa Lucía watershed, and the Embassy of USA. This proposal aims to contribute to the development of a process designed to understand and resolve complex social-ecological problems, namely the maintenance of clean water and good ecosystem health in a highly populated, strongly modified watershed in Uruguay. SARAS² aims to facilitate this development by bringing in expertise and lessons from the successful Yahara river Watershed 2070 scenarios project, an initiative of the University of Wisconsin-Madison led by Prof. Steve Carpenter (member of the Advisory Board of SARAS²).

Building resilience capacity in vulnerable agroecosystems to current and future climatic variability (Sierra del Este and Basalto-Uruguay). Ministry of Agriculture, Cattle and Fisheries of Uruguay. 2014.

The main idea is to identify a set of key drivers that condition the cattle vulnerability in some specific regions with high vulnerability to dry periods (Sierras del Este and Basalto). The drivers involve different types of (sub)systems: climate (frequency and drought intensity), social (land property, associativity, etc.) and economic (credit access, among others). More in detail, the project seeks:

- To define the set of indicators in the functioning of the overall system that allows to trace the temporal evolution of the resilience capabilities both at the regional and farm levels.
- To design and monitoring system with key patterns in terms of resilience to establish in the short term.
- To assess the adaptation and transformation capacity of the cattle system in the specific region.

ANNEX

DIFUSION

SARAS activities and outputs are getting increasingly visibly..

Workshop on Agricultural intensification and water quality

- Presidency of the Republic <http://www.presidencia.gub.uy/comunicacion/comunicacionnoticias/academia-estado-unen-esfuerzos-promover-politica-publica-calidad-agua#.VHi1vuh-O60.facebook>
- La Red21: <http://www.lr21.com.uy/comunidad/1204274-gobierno-busca-equilibrio-entre-temas-economicos-y-ambientales-en-calidad-de-agua>
- Sociedad Uruguay: <http://www.sociedaduruguay.org/2014/11/cientificos-de-dinamarca-y-uruguay-debaten-sobre-la-calidad-del-agua.html>
- La Diaria: <http://ladiaria.com.uy/articulo/2014/11/aguas-turbulentas/>
- Caras y Caretas: <http://www.carasycaretas.com.uy/talleres-sobre-el-uso-del-agua/>

Grass-woodland Transitions

- Diario Ciencia, Tecnología y Producción. (Argentina): <http://www.diariodeciencias.com.ar/no-le-dan-pelota-al-asunto-viejo-dicho-del-futbol-aplicable-a-una-noticia-del-instituto-leloir/>
- Argenpress (Argentina): http://www.ecoticias.uy/noticia/uruguay-los-bosques-se-convertiran-en-pastizales-salpicados-por-arbustos_4220
- Econoticias: http://www.ecoticias.uy/noticia/uruguay-los-bosques-se-convertiran-en-pastizales-salpicados-por-arbustos_4220
- Iagua (España): <http://www.iagua.es/noticias/dicyt/14/12/07/cambio-climatico-produce-sabanizacion-latinoamerica>
- Semanario Búsqueda http://www.busqueda.com.uy/mailling/notas/1790/nota_ambiente/
- Instituto Fundación Leloir: <http://www.agenciacyta.org.ar/2014/12/pronostican-%E2%80%9Csabanizacion%E2%80%9D-de-america-del-sur/>
- Sol Noticias: <http://solnoticias.com/2014/11/14/instituto-saras-por-la-sustentabilidad/>
- Maldonado Noticias: <http://www.maldonadonoticias.com/beta/actualidad/730-nstituto-saras-presento-trabajo-con-sintesis-de-lo-realizado-desde-2012.html>
- Intendencia de Maldonado: <http://www.maldonado.gub.uy/?n=16435>

2014 SARAS Conferences

- Departmental Government of Maldonado: <http://www.maldonado.gub.uy/?n=16746>
- FM Gente: <http://www.fmgente.com.uy/noticias/cientificos-internacionales-renen-conferencia-saras-27976.html>
- UdelaR: <http://www.ei.udelar.edu.uy/prensa/renderItem/itemId/36643/refererPagelId/789>
- Vida Silvestre: <http://vidasilvestre.org.uy/actividades/invitacion-v-conferencias-saras-2014.html>
- Unesco/MEC http://www.comisionunesco.mec.gub.uy/innovaportal/v/62604/40/mecweb/v_ciclo_de_conferencias_publicas_-_saras_2014?parentid=45800



Ruta 10 km 86, Parada 21 al fondo
Bella Vista, Maldonado - Uruguay
Email: info@saras-institute.org
Website: www.saras-insitute.org



Ruta 10 km 86, Parada 21 al fondo
Bella Vista, Maldonado - Uruguay
Email: info@saras-institute.org
Website: www.saras-insitute.org