

Report on travel to Chile, November 2006, by Erin Sills

In November 2006, Subhrendu Pattanayak and I spent three weeks in Chile, stopping in Valdivia, Concepción, Punta Arenas, and Santiago.

(1) Universidad Austral de Chile, Valdivia

FORECOS, a research center at the Universidad Austral, sponsored a conference on Ecosystem Services in the second week of November. Subhrendu gave one of the keynote talks at the conference, and I gave a presentation on payments for ecosystem services in Costa Rica. An article on the conference from the *Santiago Times* is appended. The conference was interdisciplinary, with sessions on environmental economics, policy, forest management, and watershed hydrology. Many of the faculty, graduate students, and research associates affiliated with FORECOS gave presentations on their research. This includes, for example, extensive data collection on hydrology of forested catchments and environmental valuation work, especially in the national parks of southern Chile (an issue deserving of further research is the management of private concessions for recreation services in the parks). FORECOS has funding as a national science initiative (Núcleo Científico Milenio) for one more year, and they are actively seeking funding to continue its work. Their website is <http://www.forecos.net/>

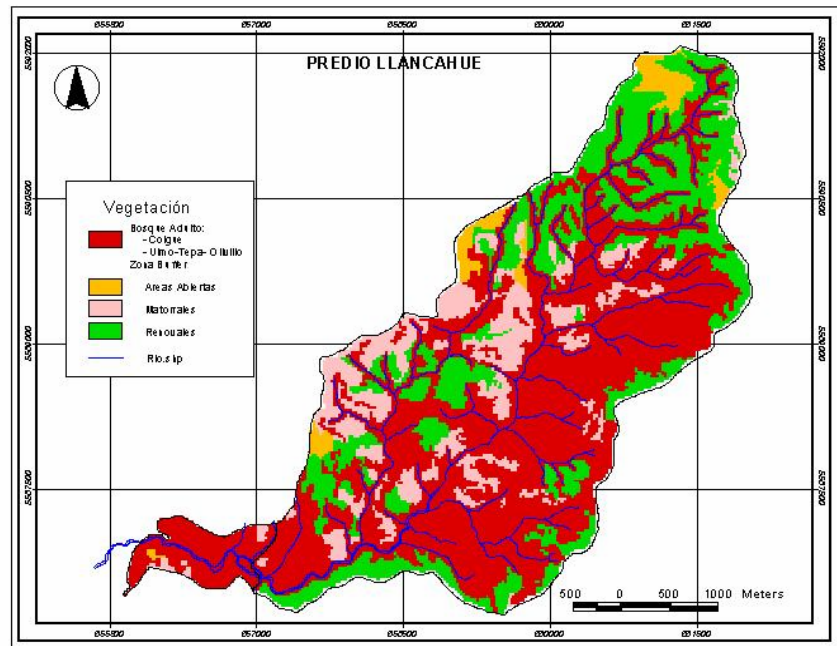
We also held extensive meetings with several key faculty:

1. Antonio Lara, director of FORECOS, incoming dean of the Facultad de Ciencias Forestales, PhD from the University of Colorado, antoniolara@uach.cl;
2. Laura Nahuelhual, environmental economist, professor in the Facultad de Ciencias Agrarias, PhD from Colorado State University, lauranahuel@uach.cl;
3. Pablo Donoso, who is Doug Frederick's key collaborator and an expert on silviculture of native forests and species, a professor in the Instituto de Silvicultura, PhD from State University of New York, pdonos@uach.cl.

Four ideas for exchange came out of these meetings:

1. research: combining watershed data that FORECOS has been collecting with secondary socioeconomic data (potentially including public health data) to conduct analyses that will support the development of payments for ecosystem services in Chile;
2. graduate students: the best way to make the linkage between NCSU and Austral more concrete would be for graduate students to become involved in joint research, and FORECOS would welcome visiting students working on their projects {e.g., Rodrigo Arriagada could spend some time at FORECOS this September, when he is in Chile for Lacep workshop and Alear conference}; and
3. education: Subhrendu and Erin could offer the short course on economic analysis of forest policy that they taught in Brazil for honors students, senior students in forestry, and forestry professionals in Valdivia; Laura could teach the non-market valuation components that Tom Holmes covered in Brazil; one of her graduate students could serve as TA in place of Simone; and the course could be taught in English with materials translated into Spanish {the original proposal was to teach the course this summer, but we have not followed up, and Subhrendu will be teaching it in Nepal in July}.
4. research, outreach, and education: the Llancahue watershed, which supplies the city of Valdivia, is being turned over to the Facultad de Ciencias Forestales for management;

Scott Sink is already working here with Doug and Pablo on silvicultural plan to encourage return of old growth characteristics; there is a local community of 20 families that supplies fuelwood to Valdivia, and one idea to investigate is how to incorporate this into the silvicultural plan and thereby justify an eco-label for the fuelwood; a second issue is how to plan for recreational access while maintaining water quality, because the forest is only 20 minutes from Valdivia; a third possibility is developing the watershed as a “social forestry lab” where students can learn about community forestry and human dimensions of forest management more generally. See map.



(2) Universidad de Concepción, Concepción

The Facultad de Ciencias Forestales hosted us in Concepción (website: <http://www.forestal.udec.cl/>). At the Tercer Congreso Chileno de Ciencias Forestales, I gave a presentation on watershed services; other presenters included Subhrendu Pattanayak, Fred Cabbage, Lee Allen, Ross Whetten, and Phillip Dougherty. Rafael Rubilar arranged a public symposium on "Bosques, Ambiente, Economía y Sociedad," where I presented on payments for ecosystem services, Subhrendu discussed program evaluation and environmental health, and Fred Cabbage talked about sustainable forest management and certification.

Fred Cabbage and I also met with forestry faculty including

- Miguel Espinosa – dean
- Eduardo Acuña – forest economics
- Luis Cerda Martínez – forest entomology
- David Gonzalez Lanteri – remote sensing & GIS
- Jorge Cancino Cancino – biometrics, and currently the academic coordinator
- Anibal Pauchard Cortés – plant ecology
- Pedro Lauro Real - growth & yield models
- Rafael Rubilar – host – forest soils and productivity

Fred gave a brief presentation about the Dept of Forestry & Environmental Resources and we then discussed how to facilitate exchange of students between NCSU and Concepcion. One possibility is to start with distance education, independent studies with bi-national student groups and faculty facilitators from both universities, or using teleconferencing facilities for seminars. To encourage students from Concepcion to study at NCSU, we could investigate whether local graduate students would be willing to host an exchange student (e.g., helping locate inexpensive shared housing) and whether some professors may be willing to allow students to ask questions and turn in assignments in Spanish (even while rest of the course is held in English). We agreed that there are many commonalities in the undergraduate curricula, and it should be easy to find courses to substitute. The graduate course schedule is less consistent year to year at Concepcion. Some faculty raised questions about whether it makes sense to build an institutional linkage for research, since individual faculty tend to pursue collaborations that make most sense from an intellectual point of view, regardless of home institutions. We agreed that exchange of graduate students and the joint doctoral program were the most likely basis for general collaboration. The suggested next step was for NCSU faculty to visit Concepcion in March, and UdeC faculty to visit NC in September. {Since that time, Lee Allen and Susan Moore led a study tour to Concepción in March, but we have not following up on faculty exchange.} Lee Allen held a follow-up meeting with Miguel Espinosa the next day to discuss specifics of course substitution and process of obtaining faculty status at each others' universities. Erin and Fred also discussed with Rafael Rubilar possible comparative research on labor conditions and productivity in forestry sectors in US and Chile. Note that Jaime Rodriguez of CMPC suggested that we also contact EULA, including Patrick Debels who conducts research on the Biobío and Baker watersheds.

Erin and Subhrendu also met briefly with Daniel Contesse and Jaime Rodriguez of CMPC, regarding plans to study the effect of plantation management on watershed hydrology. Because they have multiple factors to consider (and a limited budget) in designing the study, they may or may not include communities affected by different land use practices (or different types of communities affected by the same land uses practices). There would be potential for research collaboration if their experimental design includes sufficient variation in water users. They pointed out that conflicts over forest land use and its hydrological impacts have been restricted to a relatively small region in the rain shadow of the coastal mountain range. However, it appears that conflicts over plantation development more generally (not just with CMPC) have been widespread and received significant media attention in Brazil. It would be interesting to model the occurrence of these conflicts as a function of biophysical, socioeconomic, and forest management characteristics.

(3) Universidad de Magallanes, Punta Arenas

I met with faculty in the Instituto de la Patagonia, as well as the university coordinator of international programs. Two key contacts were Carlos Rios <carlos.rios@umag.cl> and Evelyn Morrison <evelyn.morrison@umag.cl>. Others included Luis Vladilo Zuñiga, Erika Mutschke Orellana, Claudia Andrade, Daniela Vera, and Carolina Arriozza.

The institute has about 20 students. They have one related MS degree program, in "Manejo y Conservación de Recursos Naturales en Ambientes Subantárticos", with 6 students currently enrolled.

Their research has focused on environmental impact assessment, in many cases funded by petroleum and natural gas companies. They bring together an interdisciplinary group and have developed was to measure indirect and cumulative impacts.

There is currently little environmental activism among students or in the community.

The coordinator of international programs (Claudio Venegas, Director, Relaciones Internacionales, Claudio.venegas@umag.cl) is interested in finding universities in US (or other English-speaking countries) willing to take small groups of their education students in an exchange program; the Chilean government provides scholarships, but they are requesting that tuition be waived. I explained how are study abroad exchange programs work and indicated that I would put him in touch with MEAS and other departments likely to be interested in exchange if he emailed indicating that he would like to pursue.

They are very interested in exchanging experiences with environmental impact assessment, and in acquiring more expertise in environmental economics.

(4) Pontificia Universidad Católica de Chile, Santiago

Subhrendu and I met with Guillermo Donoso, Dean, and Oscar Melo, coordinator of MS in Agricultural Economics, of the Facultad de Agronomía e Ingeniería Forestal.

The university hosts about 500 international exchange students every year; many partner institutions send too many students (that is, the exchange is not balanced) and offer some other kind of compensation, such as funding or exchange slots for MS students. There is a new initiative to offer some classes in English; for example, last year, Guillermo taught environmental economics in English.

In economics, they have a MS but not a PhD program. Their students take theory courses in the economics department. They offer the equivalent of tuition remission to a few exceptional students, but otherwise, all BS and MS students pay their own tuition (~\$5K per year). They do occasionally include student funding in research grants; they have an efficient system for administering these grants, and the university overhead is only 20%.

We discussed research on water markets and possibility for interdisciplinary collaborative research linking watershed management and downstream water demand and pricing.

Notes on travel logistics:

We traveled on both domestic airlines: LanChile and Sky Airlines. All of our flights were on time. Sky Airlines is similar to Southwest airlines and significantly less expensive than LanChile. I could not figure out how to purchase tickets via their website or how to call their main (toll-free) number from the US, but I was able to make reservations by calling the Santiago airport office.

Our hotels were Villa del Rio in Valdivia (location of the conference, nice riverside setting, but not convenient to downtown or the university), and El Araucano in Concepción (on the main plaza and a long but pleasant walk to the university). We had a difficult time getting reservations in Santiago - most hotels that we called were fully booked about a week in advance. We ended up staying in Hotel Tokyo (6714516, near Los Héroes metro stop), which is very quirky and somewhat rundown, but comfortable, friendly, convenient, and cheap. We found good vegetarian food at Café La Ultima Fronteira in Valdivia, and Verde que te quiere verde in Concepción. There are many options in Santiago, and it is easy to get around the city on the metro. Everything is remarkably well kept, neat and clean (except for lots of graffiti, which seems to be a Chilean tradition).

Photos from Patagonia (Torres del Paine National Park and Punta Arenas region)



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Peru, Argentina, Brazil, Germany, Cuba, Panama, Uruguay and the United States all congregated in Valdivia for the weeklong conference, "Ecosystem Services in the Neotropics: State of the Art and Future Challenges." The conference aimed to serve as a scientific exchange on ecosystem services such as water regulation, biodiversity, conservation, and recreation in Latin America.

The term "ecosystem services" refers to resources provided by ecosystems for the benefit of human societies. The most obvious services are clean water and air. If clean water were not available, how much would we pay to drink it? Ecosystem service researchers strive to quantify natural processes like the amount of clean water produced by a hectare of natural forest, suggesting water consumers should pay for the trees that provide the "service" of water filtration.

The concept is not exactly new. Biologists have discussed ideas of ecosystem services for decades under the title of "ecosystem functions" or "ecosystem maintenance." Gretchen Daily's NATURE'S SERVICES: SOCIETAL DEPENDENCE ON NATURAL ECOSYSTEMS, which made a splash equivalent to Rachel Carson's SILENT SPRING, elevated the term to buzzword status in 1997. "Ecosystem services" finally became commonplace in 2002 when used in numerous publications of the United Nation's Millennium Ecosystem Assessment.

Conference participant Bruce Bryers, Ph.D., a natural resources manager and biodiversity specialist for USAID, explains that the term has value outside the world of biology because it successfully translates between scientists and decision-makers – two groups well known for speaking two different languages.

"Conservationists can take a piece of land and describe lots of benefits to maintaining its biodiversity," said Dr. Bryers. "But a cattle rancher can tell the governor exactly how much they will make clearing that hectare of forest and raising cattle. It would really help the conservationists' argument if they could do the same."

Doing "the same" for conservationists means a lot of grueling fieldwork and complex economics. "Monkeys, trees, water, wood – how are you going to do the addition?" asked speaker Dr. Subhrendu Pattanayak, an environmental economist for the Research Triangle Institute, a scientific think-tank based in North Carolina. "The idea is to put it into the same units. Usually that unit is money, but it doesn't have to be."

To calculate the price of clean air, ecosystem service researchers might study Beijing. The Chinese government estimates 358,000 people die prematurely each year due to air pollution. Environmental economists would add the costs of facemasks, doctor bills from increased respiratory illnesses, the inconvenience of remaining housebound during smog alerts, and the costly brain drain of international professionals who refuse to live in the city.

Then scientists would study how much fresh oxygen is produced each year by one hectare of pine trees. Reading the multi-disciplinary findings together, policy makers would receive a clear message: it is cheaper to pay the trees for their oxygen service than to compensate for later consequences of dirty air.

The international conference was organized by the scientific think tank Ecosystem Services from Native Forests to Water Systems under Climate Fluctuations (FORECOS). Formed in 2002, FORECOS receives funds from the Chilean government and comprises over 30 researchers from the University Austral of Chile (UACH). Dr. Antonio Lara, president of FORECOS, said plans for the current event began in 2004 when the organization re-applied for government funding.

"It was an obvious theme for us," said Dr. Lara. "We have spent years thinking about ecosystem services and started organizing the conference without knowing so many other people were working on it in Costa Rica, in Mexico, and the U.S. (among other countries). We all came to the topic from our own directions." FORECOS stands by a core belief that international, multi-disciplinary work is essential to solving environmental problems. "The effect of a researcher working on this alone is almost negligible," said Dr. Lara. "It's when they work in an integrated way that progress can happen."

Several governments are adapting ecosystem service policies. The first government in developing world to do so was Costa Rica, which pays private landowners to maintain their trees. Landowners are compensated in five-year contracts with funds pooled from many sources, including private sector contributions, World Bank loans, and a gasoline tax. "It's not a cost for the state," said Mr. Jorge Rodríguez, the Costa Rican director of National Fund for Forest Financing (FONAFIFO). "It's an investment."

Ecosystem service science also has implications for the private sector. Several conference presentations linked two of Chile's most prominent resource economies:

forestry and aquaculture. "If the salmon cultivators can understand how they depend on a hectare of forest for clean water," explained Dr. Antonio Lara, "if we can measure that amount of water and its quality, then (companies) will see why it is in their interest to invest in the preservation of that watershed."

As conference organizers dismantled the poster displays on Friday, they announced they had already chosen the date for another conference on the same themes next year.

By Laura Davis (editor@santiagotimes.cl)



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