Newsletter

DFG Research Unit 816:
Biodiversity and Sustainable Management of a Megadiverse Mountain Ecosystem in Southern Ecuador

Issue 18
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Speakers' Corner

Challenges Completed in 2012

An exhausting period for the German-Ecuadorian research consortium is coming to its end. In 2012, the speakers of the Research Unit (RU) were fully occupied with coordinating the compilation of our synthesis publication in "Ecological Studies" Series at the publisher Springer and the preparation of the joint German-Ecuadorian application for the research program "Platform for Biodiversity and Ecosystem Monitoring and Research in South Ecuador" (see Newsletter no 15). For this, a new Logo has been produced (**Figure 1**).

Thanks also to the outstanding work of our assistant editor, Dr. Esther Schwarz-Weig (Mistelgau), the manuscript "Ecosystem Services, Biodiversity and Environmental Change in a Tropical Mountain Ecosystem of South Ecuador" could be finished in time and sent to the responsible editor for review. We may expect comments for clarification and other improvements from the reviewer Prof. Robert B. Jackson, and would like to ask the members of the RU to give the request for potential revision a high priority.

Review of the Research Platform

The culmination of the application procedure for the research platform program was the on-site review of the projects. The event, organized in Ecuador between 14th – 20th October 2012 stretched over three different regions: Cuenca, Laipuna and the Estación Científica San Francisco (ECSF) at Loja. Without any doubt we can say that this was the most challenging, complex, and busy review event we ever had in the history of our research in southern Ecuador. After arrival in Guayaquil, the reviewers, representatives of the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG) and designated speakers were picked up at Cuenca airport on 15th October by the scientific director of the non-university cooperation partner, Dr. Alfredo Martínez Jerves from ETAPA (**Figure 2**).

Ecuadorian Bundle

After a joint lunch (**Figure 3**), two review groups were formed for a parallel inspection of the field sites and infrastructure, the envisaged Ecuadorian

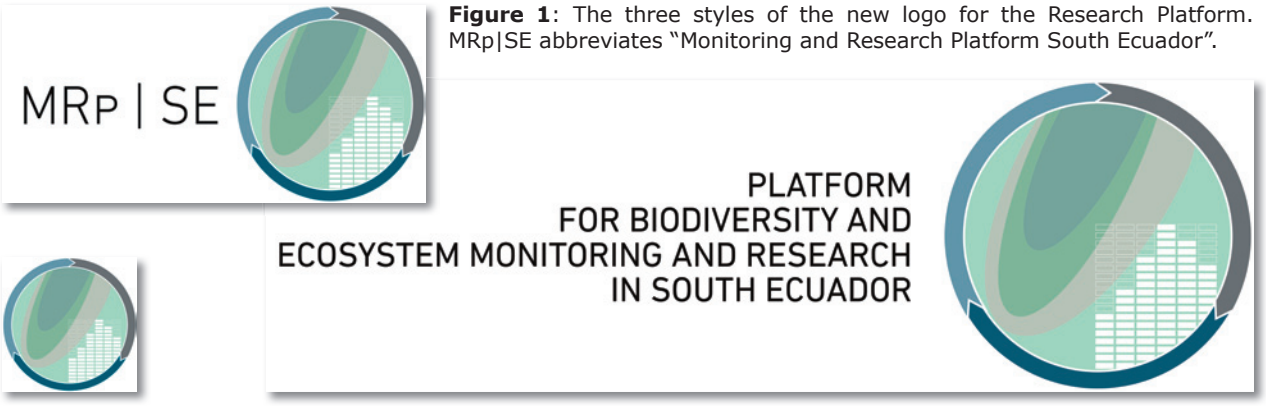

Figure 1: The three styles of the new logo for the Research Platform. MRp|SE abbreviates "Monitoring and Research Platform South Ecuador".

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Figure 2: Reviewer group, DFG representatives and designated platform speakers at the airport of Cuenca, welcomed by a delegation of ETAPA. Photo: Felix Matt

non-university cooperation partners (ETAPA, NCI, FORAGUA, Gestión Ambiental del Municipio de Zamora) and the four collaborating universities in southern Ecuador: the Technical University of Loja (Universidad Técnica Particular de Loja, UTPL), the National University of Loja (Universidad Nacional de Loja, UNL), the University of Cuenca, and University of Azuay in Cuenca. There the scientists involved in the intended collaboration had prepared a complementary joint research program for application with the Ecuadorian research funding agency SENESCYT (Secretaria Nacional de Educación Superior, Ciencia, Tecnología y Innovación).

Cuenca and Cajas

The first event in Cuenca was devoted to the visit of the city with the two universities and their labs. A mini-symposium was held at the research compunud of the Earth and Environmental Sciences of the University of Cuenca, chaired by the rector, Ing. Fabian Carrasco, in which the projects of the Ecuadorian University Consortium were presented in talks and illustrated by a selection of posters. After a short visit of the labs and workings groups the party moved on for a tour through the labs and facilities of the University of Azuay. On the second day, the review group visited the Cajas National Park, the high-altitudinal satellite region of the planned research platform. In an administrative high-level event contracts between the German research consortium and ETAPA as well as of the two Cuenca

Figure 3: At the joint lunch at the Casa Alonso two groups where formed for the further review process. Photo: Jörg Zeilinger

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Universities with ETAPA were signed in the presence of the municipal council and the Vice Mayor of Cuenca, Ruth Caldas, of representatives of ETAPA and its branches, of representatives of further regional and local administrative authorities and the media. The German consortium was represented by the deputy speaker, Professor Erwin Beck, the local coordinator, Jörg Zeilinger, and several members of the scientific board. Five reviewers and Dr. Patricia Schmitz-Möller from DFG headquarter in Bonn and Dr. Cornelia Huelsz from the DFG office for Latin America in Sao Paulo took also part in the event. The presentation of the Park's situation and facilities by its Director Dr. Alfredo Martínez Jerves was followed by a press conference with the Executive Director of ETAPA, Econ. Oswaldo Larriva (**Figure 4**). After a nice walk around the picturesque Llaviucu lagoon (**Figure 5**) the future research station, replacing a deserted hacienda and brewery was inspected (**Figure 6**). Thereafter the group

Figure 4: Entry into a new era of ecosystem research, development and management in the Andean region of Cuenca: The director of ETAPA, Econ. Oswaldo Larriva, signes the brokered contracts with the German research consortium, and with the two universities of the city of Cuenca in the presence of several media. Seated (f.l.t.r.): Econ. Carlos Cordero Díaz from the Universidad del Azuay, Ing. Fabian Carrasco from the Universidad de Cuenca, Ruth Caldas the Vice Mayor of Cuenca, Econ. Oswaldo Larriva, director of ETAPA and Professor Erwin Beck, deputy speaker of the RU. Standing (r.) Dr. Alfredo Martinez Jerves, Director of the Cajas National Park. Photo: Jörg Zeilinger

moved on to the park's visitor centre in about 3900 m altitude (**Figure 7**), from which a 40 min hike lead to the envisaged research area in one of the scattered *Polylepis* groves. The day closed with an enchanting dinner reception by ETAPA with a series of speeches and a fascinating performance of Ecuadorian dances by a group of students from the University of Cuenca.

Figure 5: A staff member of Cajas National Park explains the ecological situation and history of the research area around lake Llaviucu to the participants of the tour around the lagoon. Photo: Jörg Zeilinger

Figure 6: The abandoned brewery shall be rebuilt as a research station. It is planned that the outer walls of the building will be kept in their original shape. Photo: Erwin Beck

Figure 7: The visitor center grants a view on one of the more than 230 lagunas in the Cajas National Park. Photo: Erwin Beck.

Figure 8: The speaker of the RU, Professor Jörg Bendix (middle) discusses details of the proposed research plan for the dry forest with Prof. Henrique Miguel Pereira (right). Both were part of the second review group who were introduced to the ecosystems at Laipuna. Photo: Felix Matt

Figure 9: After DFG program director Dr. Roswitha Schönwitz (right) had laid the foundation stone of the new Cabañas the event was rounded off by welcome note from Renzo Paladines, executive director of Nature and Culture International (NCI, third from left). The Cabañas will enlarge the Laipuna field station run by NCI. Photo: Felix Matt

Laipuna and the Dry Forest

At the same time, the second review group visited the NCI-field station in the Laipuna dry forest reserve. Here, the reviewers were informed on scientific work already conducted (**Figure 8**) and could also appreciate the progress in construction works of the access road and the station building. A particular event was the laying of the foundation stone for the new Cabañas which will extend the existing station significantly (**Figure 9**).

Universities of Loja

On the way back from Laipuna, the group visited the Ecuadorian university partners at the National University (UNL) where Ing. Carlos Valarezo introduced the successful collaboration with our RU. The designated speaker of the Ecuadorian consortium, Dr. Juan Pablo Suárez (director for research at UTPL), presented the Ecuadorian platform research proposal to the DFG reviewers. Before heading for the ECSF station, a visit of the labs at the Technical University in Loja (UTPL) rounded off the instructive and successful program of the second group.

Reserva Biológica San Francisco

Both review groups re-joined at the ECSF station with an intermediate stop at the Pass El Tiro where the reviewers, while appreciating the progress of the recently commenced radar transfer project, could convince themselves that transfer projects can be successfully realized in Ecuador. In the afternoon the research sites of the Reserva Biológica San Francisco (RBSF) as well as the research station were presented to the party. An evening discussion with the designated scientific advisory board of the platform and the planned post docs finished the field inspection in the RBSF.

Review of the German and the Ecuadorian Bundles

On October 18th the review symposium with 28 oral presentations and an associated poster session was held at the UTPL in Loja (**Figure 10**). Thanks to the excellent performance of all contributors the reviewers got an overall positive impression on the proposed German program. During the morning of October 19th, the DFG reviewers additionally evaluated the SENESCYT bundle projects (**Figure 11**) submitted by the project lead agency ETAPA. At the end of the meeting, the reviewers acknowledged the quality of the contributions of our Ecuadorian university counterparts.

Figure 10: Dr. Lutz Breuer (right) just leaves the speaker's desk after presenting the proposal of project group C7 in front of the reviewers. Photo: Jörg Zeilinger

Figure 11: Ing. Juan Ignacio Burneo introduced WP3_1 of the Ecuadorian application on pasture regeneration to the audience during the review meeting of the Ecuadorian research bundle submitted to the Ecuadorian National Secretariat for Higher Education, Science and Technology (SENESCYT) held at the Technical University of Loja (UTPL). Photo: Jörg Bendix

Status Symposium in Spanish

Due to shortage of time the annual status symposium of the RU had to be arranged in parallel to the review symposium of the Ecuadorian consortium. It was presented exclusively in Spanish and attracted about 250 participants; more than in the years before. Nine oral overview presentations initiated a vivid discussion among the audience in the main lecture hall of the UTPL (**Figure 12**). The whole event was completed by a comprehensive poster session where every author could advertise his poster with one power point slide in front of the audience. This procedure was introduced successfully for the first time in the Spanish part of the Status Symposium.

After the review and status symposia, a joint workshop with Ecuadorian and German principal investigators, kindly organized by Juan Pablo Suárez, was held at UTPL. The designated speakers of the German bundle projects introduced the subprograms A, B and C of the German application, and a roadmap for further joint activities was intensively discussed. In particular, data mining and writing of joint papers were among the discussed topics.

Summary and Acknowledgements

All in all, the whole event can be considered a great success, excellently prepared and organized and conducted without any mishap, a quality of performance that could not be expected in view of such a complicated procedure. At this point the designated speakers would like to express their deepest gratitude to all who contributed to the event. Space does not allow to name them all personally but, in place of all, we would like to thank the leading persons of the Ecuadorian partners. These are from the university side: Juan Pablo Suárez (UTPL), Carlos Valarezo (UNL), Jan Feyen and Rolando Celleri (Uni Cuenca) and Edwin Zárate (Universidad del Azuay, UDA). For their excellent cooperation we would especially like to thank: For the Loja/Zamora consortium Renzo Paladines (NCI) as well as Alfredo Martínez Jerves and Oswaldo Larriva of ETAPA for the Cuenca group.

In spite of the challenges of the event – not least because of the extremely tight time schedule – the entire meeting was supported by a spirit of friendship and respect especially by our Ecuadorian partners which was well perceived by the reviewers and the DFG delegates. From the German side, particularly the local managers Jörg Zeilinger and Felix Matt deserve our paramount respect for their competent organization but we also wish to thank all applicants for their contributions and in particular the designated members of the scientific advisory board of the German consortium for the platform. Last but not least, we are very grateful to the responsible DFG program directors Dr. Roswitha Schönwitz and Dr. Patricia Schmitz-Möller for enabling the evaluation event at the site.

Preliminary Results

Meanwhile, preliminary results of the review process were received from the DFG office. Thirteen out of 25 projects from bundles A, B and C got a recommendation for funding by the reviewers. Bearing in mind the actual financial situation of

Figure 12: The 15th Annual Status Symposium of the RU attracted more participants than all the conferences before. Photo: Jörg Zeilinger

DFG, this outcome is a great success, in particular because research in southern Ecuador can be continued. It must be emphasized, however, that further planning should only be started when the written approvals have been received and the co-operation contracts have been signed by all partners (Ecuadorian non-university partners and German principal investigators or universities). Despite the general success, the situation for the declined projects must remain unsatisfactory. Some of these projects might get the opportunity to resubmit an improved proposal to DFG in 2013. Usually applicants receive the official note about their application together with remarks and recommendations of the reviewers. Irrespective of granting or declining of a project such advices should be considered as most useful for the project work, or for improving a proposal if resubmission is encouraged.

Jörg Bendix & Erwin Beck
Speaker and Deputy Speaker of the RU

News from the ECSF

Laserscanning Completed

Between 12th and 19th of November the second and final part of the Airborne Laserscanning (ALS) project was realized. The main aim is to obtain a tridimensional vegetation model of the whole watershed of the Rio San Francisco.

The data will contribute important parameters for the modeling of water and nutrient cycles, sustainable management of natural recourses and is also an important prerequisite for the new Platform for Biodiversity and Ecosystem Monitoring and Research in South Ecuador.

New Phone Numbers

Since 30th of September ALL cell phone numbers in Ecuador changed, and they were increased from nine to ten digits. A “9” was added right after the first zero. When you call from abroad the “9” has to be added right after the Ecuadorian country calling code.

For example: Movistar cell phone number of the ECSF calling from Ecuador now is: 0 9 95 950393 (was before: 095 950393)
Calling from abroad: now is: +593 9 95 950393. (was before: ++593 95 950393) *Jörg Zeilinger*

Figure 12: On its flight the helicopter crossed the ECSF research station several times. Photo: Ekaterina Romanenko.

News from NCI

The *Macizo del Cajas* Biosphere Reserve at the UNESCO

Sent by the Ministry of Foreign Affairs on behalf of Ecuadorian State, on October 16th, the complete dossier of the "Macizo del Cajas Biosphere Reserve" arrived at the UNESCO headquarters in Paris. The proposed Biosphere Reserve - the first in the Ecuadorian Western Cordillera (**Figure 13**) - includes 2,230,402 acres of land and 211,097 acres of sea surface. The natural ecosystems are as diverse as Paramó, mountain forest, cloud forest, mangroves, seasonal deciduous forest and desert. It provides water supply for almost 850,000 inhabitants, allows the production of 50% of hydro-energy of the country, besides large productive areas for cattle, cocoa, banana and industries.

This proposal garnered letters of support from 57 institutions from different governmental levels and private enterprises as well as from universities and development agencies. Some of them are:

- Four ministers (environment, natural patrimony, foreign affairs, agriculture)
- Eight sub secretaries (planning and development; environment; production, employment and competitivity; economic and social inclusion; foreign affairs, commerce and integration; water secretary; high education, science and technology)
- Three provincial councils (Azuay, Cañar, El Oro)
- Thirteen municipal councils (Cuenca, San Fernando, Girón, Santa Isabel, Pucará, Ponce Enriquez, Pasaje, Guabo, Machala, Azogues, Cañar, Déleg, Naranjal)
- Nineteen parrish councils (San Fernando, Chumblin, Girón, Asunción, San Gerardo, Santa Isabel, Shaglli, Abdón Calderón, Pucará, San Rafael de Zharug, Camilo Ponce, Cármen de Pijilí, El Progreso, Caña Quemada, El Guabo, La Iberia, Machala, Molleturo, Tenguel)
- Three water/hydropower enterprises (CELEC at Hidropaute; ETAPA EP at Cuenca, EMAPAL at Azogues)
- Two group organizations of private enterprises (ACUDIR and CERES)
- Two universities (Cuenca and Guayaquil)
- Three cooperation organizations (NCI, GIZ, and AVINA)

Figure 13: Location of the proposed Biosphere Reserve (orange) and the three Reserves already established. The technical and political process took two years before the entire file could be send to UNESCO. Map: NCI.

Figure 14: Members of the eight institutions who constitute the Committee for the Declaration of the Biosphere Reserve, including NCI, at the UNESCO headquarters in Quito. Photo: NCI.

The UNESCO process of qualification will take place during the next months and we expect to have the declaration in July 2013. During this time the institutions of the Committee (**Figure 14**) will be working on the development of the institutional model, selection of the priority conservation and development programs, and raising funds at national and international levels.

Two programs are already in place as first mechanisms to implement conservation and sustainable development actions in the framework of this Biosphere Reserve: **1)** the FONAPA water fund to implement conservation of watersheds with the participation of local governments; and **2)** the Corporate Social Responsibility Center established to implement a social responsibility strategy among the private enterprises within the Biosphere Reserve.

Other institutional mechanisms should be created in the near future to work on sustainable fisheries, agriculture (cocoa and banana), and the programs that are prioritized by local stakeholders. A mission to UNESCO to reinforce the interest and knowledge of local authorities, fund raising, and building communication among key institutions (international cooperation, enterprises, and governments) at the international level is being prepared.

In this section Nature and Culture International (NCI, www.natureandculture.org) introduces its activities and reports recent progress. NCI is a non-governmental organization whose mission is to assist in the conservation of biological and cultural diversity.

Science News

Farmers' Preferences of Proposed Land Use Options

Why to Estimate Farmers' Preferences?

In the mountain areas of southern Ecuador the conversion of rainforests into pastures is still an ongoing process. At the same time the phenomenon of land abandonment occurs, expressed in a relatively high amount of bracken-fern covered areas. Under growing resource demands this already cleared but unproductive land is regarded as focus for sustainability research. The aim should be to re-integrate it into production and to reduce the pressure on the remaining forests (e.g. [1])

Based on field experiments of reforestations (e.g. [2, 3]) and re-establishments of pastures (e.g. [4]), four land use alternatives were identified as feasible options to the currently preferred option of leaving the area abandoned, namely:

- Reforestation with native tree species (*Alnus acuminata*)
- Reforestation with exotics (*Pinus patula*)
- Re-establishing extensive pasturing
- Establishing intensive pasturing

The success of any recommendation of more sustainable land use options depends on the extent to which the proposed alternatives will be accepted by the farmers. In this respect, acceptance refers to the farmers' evaluation of the proposed land use alternatives in terms of their potential to improve land productivity and thus household income (cf. [5]). Aside of the economic point of view, previous research in southern Ecuador has pointed out that socio-cultural differences in land use and livelihood strategies exist between ethnic groups (cf. [5]). Thus, the ethnic or socio-cultural background of the farmers has also to be considered in terms of preference or acceptance of land use alternatives.

The study was guided by the following questions:

1 Which of the proposed land use alternatives is mostly preferred by the farmers?
2 Are there ethnic or socio-cultural related differences in the preference?

Preference Analysis

The farmers' preference of five land use options was estimated using a standardised questionnaire which also evaluated the reasons for the mentioned preferences, the approximate extent of abandoned land per interviewed household, and the reasons of land abandonment. Interviews were undertaken in the communities of El Tibio (Saraguro) and Los Guabos (*mestizo*), and along the road Loja-Zamora (scattered *mestizo fincas*) in October and November 2011. The survey comprises a total of 59 interviews valid for the ranking procedure, 37 of them with *mestizos* and 22 with Saraguros. The farmers were asked to evaluate the presented land use options according to their preference, using a rating scale of 1 to 5 categories, being 1 the best accepted option. Two scenarios were tested, one in which farmers would carry out all investments by themselves, a second, in which farmers would get external aid for main inputs (e.g. seedlings, fertilizer).

The ranking was estimated according to a weighting method: The total of frequencies for each rating category was adjusted by multiplying them with a weighted factor. Using a weight scale of 1 to 0.2, the factor gave one fifth less influence to the lower

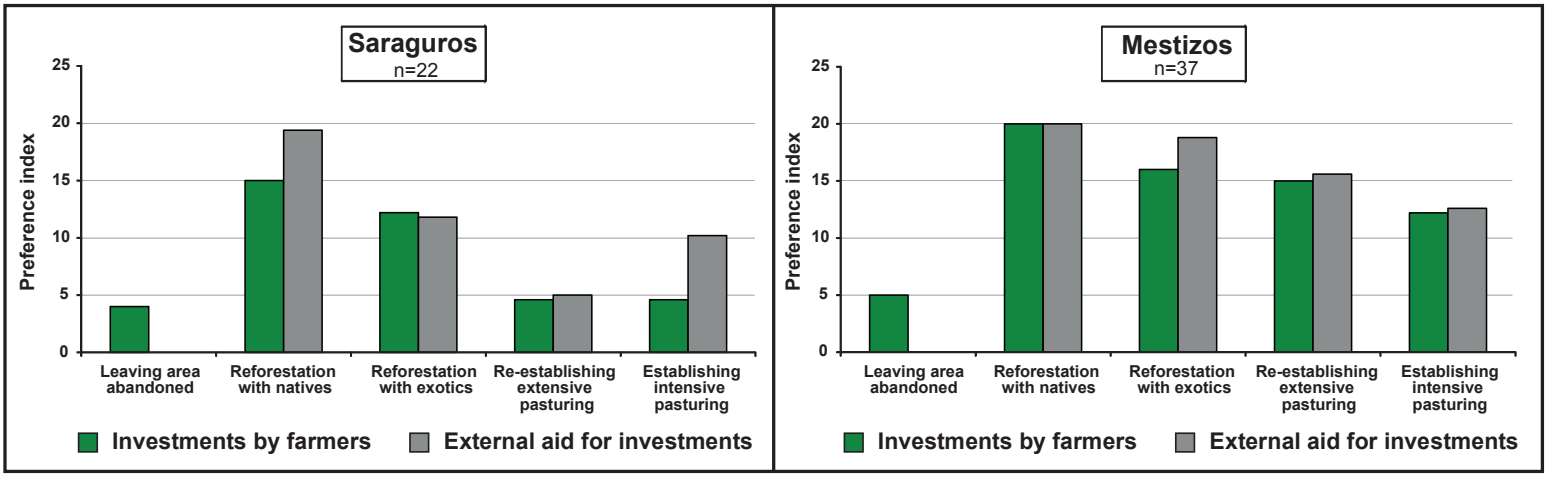

Figure 15: Preference indices for considered land use options according to two investment scenarios among Saraguro and *mestizo* farmers. Graphs: Pohle, López, Gerique

rating category. The sum of the weighted frequencies was used to determine the ranking, being the highest total the highest rank.

Results

Among both ethnic groups and for both scenarios the option "**reforestation with natives**" was the most preferred one by the farmers (**Figure 15**). The second preference was given to the option "**reforestation with exotics**". Farmers mainly preferred the "tree options" because they experience "lack of timber" and "labor shortage". *Mestizo* farmers tend to consider more often pasturing as an option than Saraguros, but if external aid would be offered, Saraguros then would prefer intensive more than extensive pasturing. Among the *mestizos* the option "re-establishing extensive pasturing" was preferred more than the option "establishing intensive pasturing" because the farmers considered the ecological effects of using fertilizer as negative, and the costs as high. "Leaving area abandoned" was the least attractive option for farmers of both ethnic groups.

Discussion

The survey revealed that the lack of timber is a main concern for the local population to prefer reforestation. These results indicate that the preferences for alternative uses of abandoned land in the study area might follow the "forest scarcity path" of the forest transition theory [cf. 7, 8]. Based on a microeconomic approach, this theory states that timber scarcity would impulse the plantation or the natural re-growth of forests [9], which can be seen as an opportunity for conservation [10,11].

Perdita Pohle, María Fernanda López, Andrés Gerique

Acknowledgements
We wish to thank all the inhabitants of the communities under study for their hospitality and generous participation.

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Figure 16: To measure N_2 fixation intact soil cores from the canopy and forest floor were placed in jars (**top**), which were then sealed, and 10% of the headspace air was replaced with acetylene gas. The jars were installed in the forest floor just outside each NUMEX site (**bottom** – near the Bombuscaro site) and gas samples were taken from the jars four times during the 24 hours of incubation. Ethylene flux was converted to N_2 fixation using the literature ratio of 3.9:1 as described in [1]. Photos: Amanda Matson

Nitrogen Fixation in Canopy and Floor Soil Samples

Despite the high-energy cost of nitrogen (N_2) fixation and the fact that many tropical forest soils are not N limited, fixation rates in tropical forests are often considerably higher than in other forests [2]. In the framework of the Nutrient Manipulation Experiment (NUMEX) we aimed to quantify free-living N_2 fixation in soils across an altitudinal and vertical (canopy [CY] and forest floor [FF]) gradient, and assess the response of N_2 fixation to increased N availability (**Figure 16**). We hypothesized that fixation would be lower in soils with N fertilization but would, in general, increase with moisture and temperature.

Preliminary results show that fixation in both the FF and CY was inhibited by increased N availability (**Figure 17a**). The response was stronger in FF soils, presumably due to the slower, secondary fertilization occurring in the CY soils. This was corroborated by significantly higher mineral N found in N-fertilized (compared to control) FF soils as compared to non-significant differences in CY soils. However, the drivers of N_2 fixation are still not completely understood. Although the elevation gradient included average annual air temperatures from 9.4°C to 19.4°C [3] statistical analysis showed that elevation explained very little of the variance in the data. In addition, measures of the same areas in the wet and dry seasons showed far less fixation occurring in the wet season (**Figure 17b**) as compared to the dry season (**Figure 17a**). Although further work is required to understand the variation in these data, it is notable that CY and FF fixation rates were similar. Therefore, where CY soils are present, they should be included in nutrient budgets.

Amanda Matson, Edzo Veldkamp

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Data Warehouse News

Usage Analysis

The organized collection and distribution of information is a key factor for any successful project. The central Data Warehouse (FOR816DW) provides an information management system (**Figure 18**) to support both the administration of the project, as well as the data management and knowledge exchange for the scientists within the Research Unit (and beyond).

The project management and the data management components are linked by a shared user management, project structure and rights management. This reduces the maintenance work on user accounts and allows cross links and information reuse.

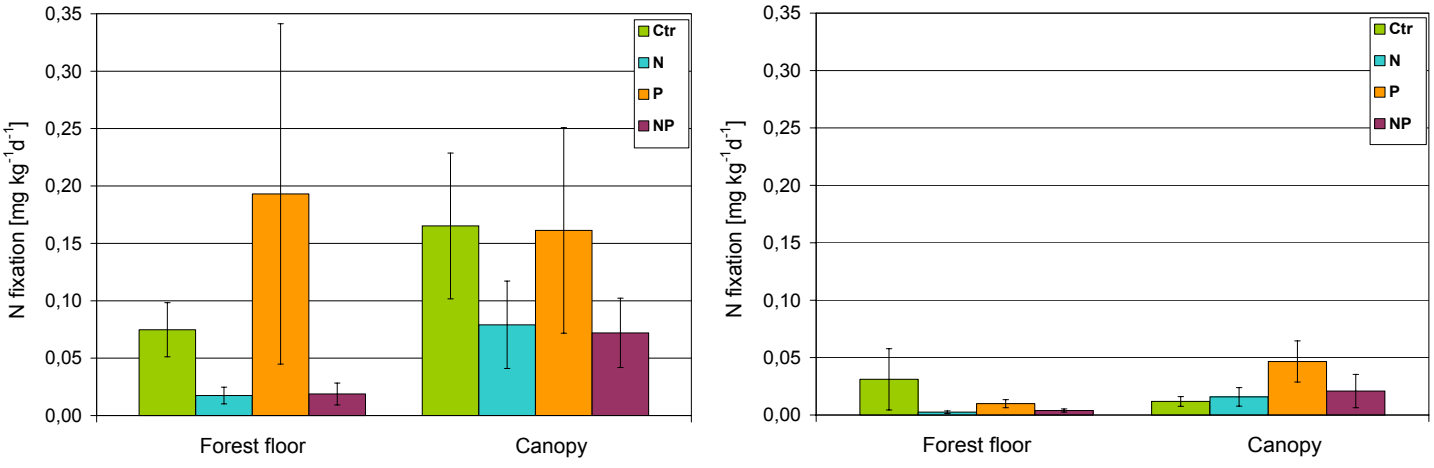


Figure 17: N_2 fixation [in mg N kg^{-1} y^{-1}] in a tropical montane forest of south Ecuador. Dry season measurements (**a**) were taken in November 2011. Wet season measurements (**b**) were taken in June 2012. Values for each treatment are the average of 4 replicate measurements taken from 3 elevations (n = 12), the error bars show standard error. There were no significant differences between elevations. Graphs: Amanda Matson

That both components are needed and used is visualized by the constant user activities. **Figure 19** presents the monthly counts of specific actions that have been used during the last two years (July 2011-June 2012). The counted "logins" indicate the general access of registered users to the internal webpages (mean: 384 logins per month). As representative actions for the usage of the project management component the usage frequency the travel accounting (mean: 117 times per month) and the station booking (mean: 120 times per month) modules are presented. Events like the Annual Status Symposium in October (see also page 5) are can be identified in the higher access rate of the "station booking system" during the months preceding the event. Accountings are done during the whole year, but have a half-year maximum around the status symposium in autumn and the GfÖ (Ecological Society of Germany, Austria and Switzerland, Gesellschaft für Ökologie) conference in spring.

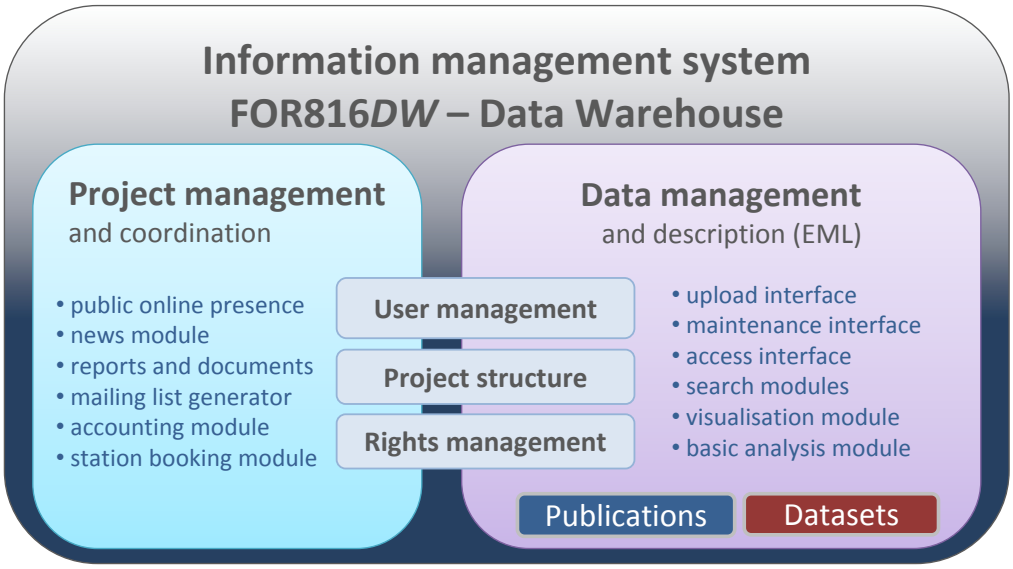
The values of search requests for publications (mean: 193 request per month) and dataset (mean: 233 request per month) indicate the usage of the data management system. Here only actively entered search phrases are counted.

It is noticeable that there has been a higher interest in data in the second quarter of the project runtime (1. half year of 2011) while the search for publications is a more continuous activity. This represents the workflow of scientific projects and especially of the three years funded PhD students: set-up time, data acquiring and combined analysis, comparison with existing knowledge and publication of results.

A more detailed evaluation of the users of the data management component of the FOR816DW is presented in **Figure 20**. The counted search requests are split by academic status. There have been more requests on datasets than on publications, while the interest of external visitors (w/o login) seems to be higher in publications. The search activity of a status group must be interpreted in relation to the number of active users in each group. So it is not surprising that the PhD students and the diploma students in sum send the most requests. But the relative mean of each active user is more interesting. In case of publications each active PI has sent 26.5 requests, each PostDoc 22.8, each PhD student 31.2 and each diploma student 19.6 requests. That means the PhD candidates are the most active searchers for publications. For example this are: 42.9 requests by each PI, 38.3 requests by each PostDoc, 41.5 requests by each PhD student and 51.9 requests by each diploma student.

So in mean each diploma student sends 51.9 requests for datasets, but only 19.6 requests for publications. Do diploma students rely on existing data but ignore the already existing knowledge in publications?

An interesting aspect for us, the data management team, is why do only about 50% of the PIs, PostDocs and PhD students (in case of diploma students only about 30%) use the search functionalities of the data management component? Do they simply not know about it? Do they not know how to use it? Or do they just not need a data management system for research data and publications?



Key figures (Oct. 2012):

550 registered users
organized in
70 sub-projects
have contributed
480 publications
and defined
690 attributes
which are linked to
450 data sets
holding
120 raster entities,
35 other entities,
and
480 tabular entities
which contain
6.8 Mio single values

Figure 18: Components of the information management system FOR816*DW* and modules that have been developed for the project and data management of a collaborative ecological RU. Graph: Thomas Lotz.

As a service oriented project, we hope we could help all those who have used the FOR816*DW* and like to motivate all the others to give it a try on www.tropicalmountainforest.org.

Thomas Lotz (Data Manager) &
Maik Dobbermann (Developer and Webmaster)

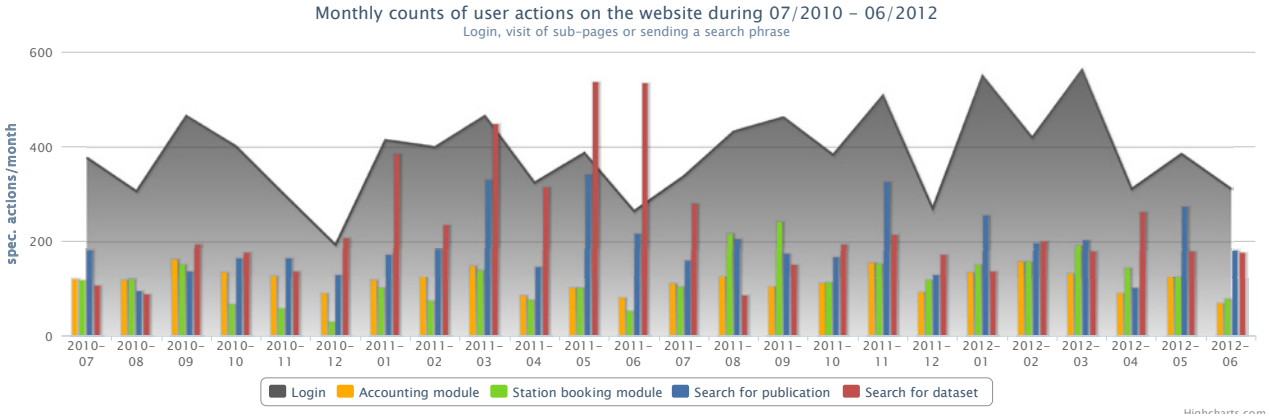


Figure 19: The monthly count of typical user actions represents the intensive usage of the different modules of the FOR816*DW*. More details in the text. (Screenshot from www.tropicalmountainforest.org > Data > FOR816dw statistics). Screenshot: Thomas Lotz.

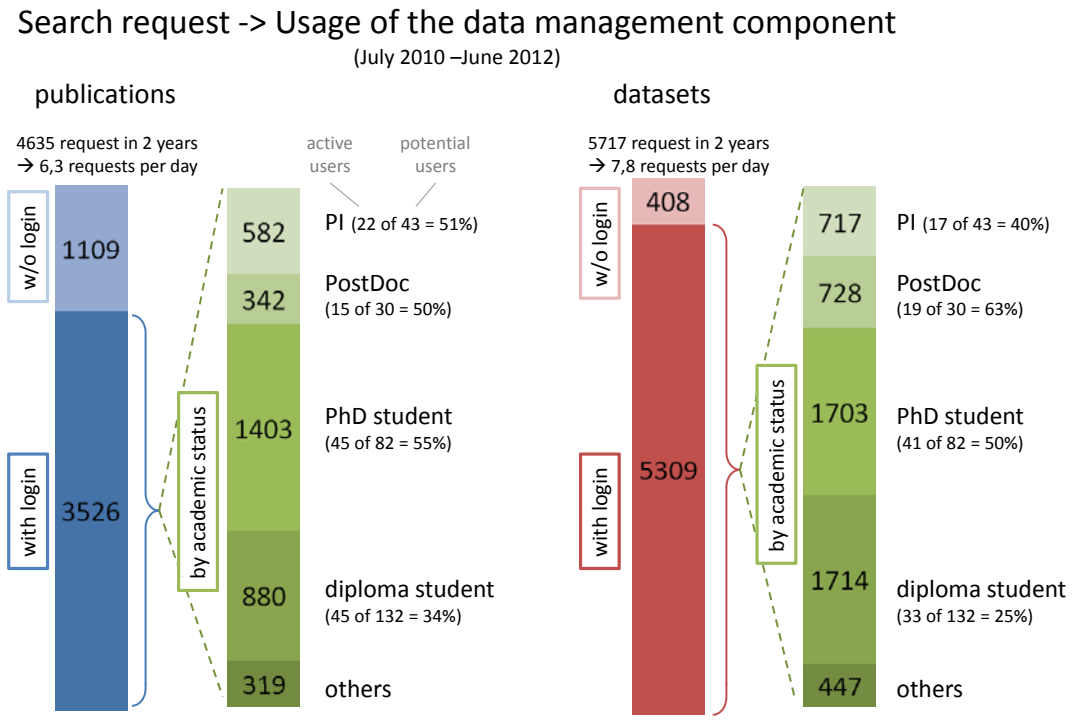


Figure 20: The search request for publications and dataset are summed up for a two year period. Most requests are done from RU members (with login) but there are also interested anonymous parties (with-out login). The requests of the registered members are split into groups by academic status. Additionally the number of potential and actually active users of each group is stated. This allows an assessment of the usage of the data management component by different user groups (e.g. 50% of the 30 registered PostDocs have used the search function for publications. These 15 users have entered 10% of all logged search requests for publications.). More interpretation in the text. Graph: Thomas Lotz.

Publications

Recent Publications of the RU[1)]

Breuer L (2012): Simulating ecosystem functioning of tropical mountainous cloud forests in southern Ecuador. *Ecological Modelling* 239, 1-2 doi: 10.1016/j.ecolmodel.2012.05.027.

Castro LM, Calvas B, Hildebrandt P, Knoke T (2012): Avoiding the loss of shade coffee plantations: how to derive conservation payments for risk-averse land-users. *Agroforestry Systems online*. doi: 10.1007/s10457-012-9554-0.

Crespo P (2012): Analysis of the rainfall runoff processes of Andean ecosystems in southern Ecuador: using hydrometric, tracers and modeling approaches. University of Giessen, *phd thesis*

Dislich C (2012): Über die Bedeutung von Arteigenschaften für Koexistenz und Waldregeneration nach Störungen? Eine Modellierungsstudie zum besseren Verständnis artenreicher Wälder. University of Bayreuth, *phd thesis*

Dislich C, Huth A (2012): Modelling the impact of shallow landslides on forest structure in tropical montane forests. *Ecological Modelling* 239, 40-53. doi: 10.1016/j.ecolmodel.2012.04.016

Fries A (2012): Implementation of new methods for the regionalization of climate data. Uni Marburg, *phd thesis*

Fries C (2012): Regionalisierung von Bodenkohlenstoff im Flusseinzugsgebiet des Rio San Francisco, Südecuador. University of Giessen, *master thesis*

Hamer U, Rumpel C, Dignac M (2012): Cutin and suberin biomarkers as tracers for the turnover of shoot and root derived organic matter along a chronosequence of Ecuadorian pasture soils. *European Journal of Soil Science online*, 1-12 doi: 10.1111/j.1365-2389.2012.01476.x.

Hamer U, Potthast K, Burneo JI, Makeschin F (2012): Nutrient stocks and phosphorus fractions in mountain soils of Southern Ecuador after conversion of forest to pasture. *Biogeochemistry* in press, 1-16. doi: 10.1007/s10533-012-9742-z

Homeier J, Hertel D, Camenzind T, Cumbicus Torres N, Maraun M, Martinson G, Poma N, Rillig MC, Sandmann D, Scheu S, Veldkamp E, Wilcke W, Wullaert H, Leuschner C (2012): Tropical Andean Forests Are Highly Susceptible to Nutrient Inputs - Rapid Effects of Experimental N and P Addition to an Ecuadorian Montane Forest. *PLoS ONE* 7, e47128. doi: 10.1371/journal.pone.0047128.

Keidel K (2012): Atmospheric Deposition into a Tropical Montane Rain Forest in Ecuador: Trends in Nutrient Concentrations and Fluxes. Johannes Gutenberg University Mainz, *diploma thesis*

Martinson G, Corre M, Veldkamp E (2012): Responses of nitrous oxide fluxes and soil nitrogen cycling to nutrient additions in montane forests along an elevation gradient in southern Ecuador. *Biogeochemistry online* doi: 10.1007/s10533-012-9753-9.

Menz J (2012): Biogeochemical Changes in Response to Precipitation Events in Stream Waters of a Tropical Mountain Forest in southern Ecuador. University of Giessen, *bachelor thesis*

Münzenberger L (2012): Molekulare und lichtmikroskopische Untersuchungen der Mykorrhizen von Graffenrieda harlingii Wurdack (Melastomataceae) aus dem tropischen Bergregenwald Süd-Ecuadors Universität Tübingen, Evolutionäre Ökologie der Pflanzen. Universität Tübingen, *bachelor thesis*

Knoke T, Román-Cuesta RM, Weber M, Haber W (2012): How can climate policy benefit from comprehensive land-use approaches? *Frontiers in Ecology and the Environment* 10, 438-445. doi: 10.1890/110203

Palomeque X (2012): Natural succession and tree plantation as alternatives for restoring abandoned lands in the Andes of Southern Ecuador: Aspects of facilitation and competition. *Dissertation thesis*, Center of Life and Food Sciences Weihenstephan, Technische Universität München. Available online at the website of the RU: http://137.248.191.82/publications.do?citid=1228.

Schwab L (2012): Gehalte, Speicher und Umsetzungszeiten von Kupfer und Zink in einem tropischen Bergregenwald in Ecuador. Geographic Institute, University of Berne, *bachelor thesis*

Seeger J (2012): Der Einfluss von Meereshöhe, Topographie und Bodeneigenschaften auf die Blattmorphologie und -nährstoffgehalte südecuadorianischer Bergregenwaldbäume. University of Göttingen, *bachelor thesis*

Silva B, Roos K, Voss I, König N, Rollenbeck R, Scheibe R, Beck E, Bendix J (2012): Simulating canopy photosynthesis for two competing species of an anthropogenic grassland community in the Andes of southern Ecuador. *Ecological Modelling* 239, 14-26. doi: 10.1016/j.ecolmodel.2012.01.016

Strutzenberger P, Brehm G, Fiedler K (2012): DNA Barcode Sequencing from Old Type Specimens as a Tool in Taxonomy: A Case Study in the Diverse Genus Eois (Lepidoptera: Geometridae). *PLoS ONE* 7(11): e49710. doi:10.1371/journal.pone.0049710

Unger M, Homeier J, Leuschner C (2012): Effects of soil chemistry on tropical forest biomass and productivity at different elevations in the equatorial Andes. *Oecologia* 170, 263-274.

Vorpahl P, Elsenbeer H, Märker M, Schröder B (2012): How can statistical models help to determine driving factors of landslides? *Ecological Modelling* 239, 27-39. doi:_10.1016/j.ecolmodel.2011.12.007

Wäge J (2012): Der Einfluss von Stickstoff - und/oder Phosphorzugaben auf die Herbivorie in einem tropischen Bergregenwald in Südecuador University of Göttingen, *bachelor thesis*

Waltz T (2012): Räumlich-zeitliche Variabilität der Isotopensignatur ($^{2}H/H$ und $^{18}O/^{16}O$) im Niederschlag eines südecuadorianischen Bergnebelwald-Einzugsgebiets. University of Giessen, *master thesis*

Wittich B, Horna V, Homeier J, Leuschner C (2012): Altitudinal decrease in photosynthetic capacity in tropical trees: A case study from Ecuador and a pantropical literature analysis. *Ecosystems* 15, 958-973. doi: 10.1007/s10021-012-9556-9.

[1)] Peer reviewed publications and original theses presented here were uploaded to the data warehouse in the second half of 2012 and haven't been presented in this or one of the preceding TMF Newsletters yet.

Deadline

The editorial deadline for the forthcoming issue of the TMF Newsletter is:

February 21st 2013.

Please send your ideas, manuscripts and images to Esther Schwarz-Weig at the editorial office. E-mail: esw@sci-stories.com

Event Calendar

gtö Conference

The speakers of the RU, Jörg Bendix and Erwin Beck, will chair a session at the next conference of the Society for Tropical Ecology (gtö) entitled "Impacts of environmental change on biodiversity and ecosystem functioning / services in Tropical High Mountains". The conference will be held in Vienna, Austria, on 2nd – 5th April 2013. RU member Professor Dr Konrad Fiedler will be the congress president.

People and Staff

Photo: Ximena Palomeque

Ximena Palomeque (Project C1) successfully finished her PhD thesis at the Center of Life and Food Sciences Weihenstephan, Technische Universität München. Her comprehensive field work and data analysis allowed her to provide more insight on pathways of natural succession on abandoned areas and to define some explicit recommendations for restoration with native tree species (see Publications). Since November 2012 Ximena started to work on the topic of protected areas and biological corridors, a project which is carried out by Universidad Técnica Particular de Loja (UTPL) and CATIE (Costa Rica).

Patrick Hildebrandt

Photo: Jonas Vogel

The data warehouse manager **Thomas Lotz** (Project Z1) will leave the RU by the end of December 2012 because he was offered a permanent staff position in a Geographic information system (GIS) company. He did a great job in promoting the data warehouse development significantly, visible in a lot of new functions and features which improve data handling and analysis. We regret that he cannot accompany the upcoming challenges of developing a distributed joint Ecuadorian-German data management system for the platform. Thomas, on behalf of the RU816, I thank you for your excellent work over the last years and wish you all the best for what is coming. *Jörg Bendix*

Credits and Contact

DFG Research Unit 816

More information about the Research Unit (RU 816) investigating Tropical Mountain Forests (TMF) is available at:
www.tropicalmountainforest.org

Speaker of the RU

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