GEO-NETWORK OF LATINAMERICAN-GERMAN ALUMNI (GOAL)

Newsletter No 4 December 2014

Content

1. Editor's note

The year 2014 has been a very satisfying year for GOAL. Our group is increasing and we have nine new members from Colombia, Mexico, Peru, Paraguay and Brazil. In addition, over 36 members financed by DAAD made the trip to Heidelberg for the *LAK-2014* and our GOAL's workshop. In this very successful workshop on "*Geosciences and Society – Bridging the gap with GeoParks and Co*" in Heidelberg, we had the opportunity to make some fundamental changes for the future of GOAL which were discussed and published in the Minutes of the Assembly 2014. GOAL's website is under construction but we hope to get several new members and contacts through this site and it will be easier for us to contact each other.

The Newsletter has been published four times a year and it was designed to reach a wide-spectrum of readers interested in all geosciences activities done between Germany and Latin America. Each issue contained articles about ongoing research projects that our colleagues and other German institutions were doing in Latin America. It also provided our readers with summaries of recent activities and meetings that our members were doing in their countries. However, as things are, next year the Newsletter is planned to be published once a year in the month of December, and Special Editions will be published during the year.

Many thanks to all contributors and readers in this and previous editions of the GOAL's Newsletter for their support throughout the years.

Merry Christmas and a very happy New Year!
Ein frohes Weihnachtsfest und alles Gute zum neuen Jahr!

Dr. Nury Morales-Simfors, Geo-Network of Latinamerican-German Alumni (GOAL), nusi0453@hotmail.com

Happy Holidays

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2. Analysis for implementing a comprehensive groundwater monitoring system for Forestal Oriental in Uruguay

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Abstract

Fast growing Eucalypts are known for their relatively high rates of water use.

The 100,000 hectares of Forestal Oriental SA eucalyptus plantations (in 2009- see figure 1) to supply its owner, Botnia's pulp mill (now UPM), are distributed across the western parts of Uruguay, over a very large geographical area of 36,000 km^2 (3,600,000 ha). The plantations are located on the recharge zones of two regional aquifer systems, the North Basin Aquifer System and the Guarani Aquifer System (figure 5). The apparent concentration of plantation on the recharge zones of these aquifers is largely a function of the prioritisation of land for forestry purposes by the Uruguayan government. In addition, groundwater systems in Uruguay are highly complex and there is little hydrological baseline data available (both for river flow and groundwater dynamics). Collectively these factors indicate that monitoring water impacts at the level of each individual plantation is considered impractical and of limited scientific value.

Given the constraints identified above, requirements and commitment to sustainable practices, a number of complementary methods to assess the impact of Forestal Oriental (FO) plantations on water resources have been identified and will be implemented.

This paper seeks to address the challenge of designing a monitoring system that meets the conditions of comprehensivity while recognising the practical demands of the large spatial spread of plantations. By means of a **risk assessment** and by attributing numeric values to the consequences and likelihoods of the loss of surface and groundwater resources on social, economic and environmental assets, it is possible to identify those assets at greatest possible risk (table 1). Besides, at a macro-catchment scale we assessed the vulnerability of aquifer systems by determining the proportion of their recharge zones afforested by FO. We conclude that the possible effect on recharge is small and undetectable. (figure 6) The study then concludes with priority additions to a monitoring infrastructure to keep track of the water resources critical to the sustainability of the assets identified.

No assets were identified as being at high risk. However, the risk assessment identified domestic water supplies to some hamlets and small settlements close to FO operations as being somewhat at risk. Dairy operations near FO operations are the only identifiable economic activities potentially at risk although the risk rating is moderate to low. Low levels of risk were found to apply to most environmental assets as these depend on the maintenance of habitats that are neither riparian nor groundwater related, but we recommend monitoring at the one protected area.

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Analysis for implementing a comprehensive groundwater monitoring system for Forestal Oriental in Uruguay

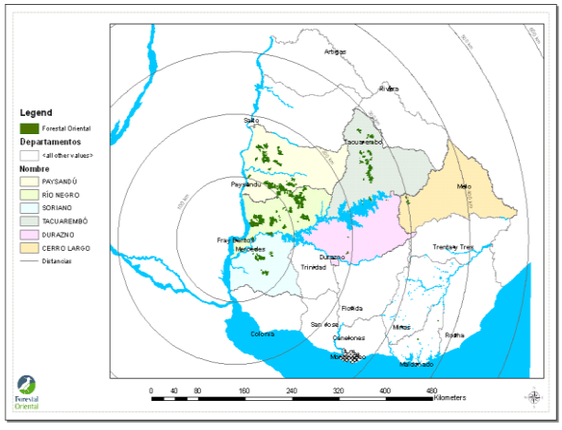


Figure 1: *Location of FO plantations (2009) Radial lines refer to distance from the pulp mill in Fray Bentos*

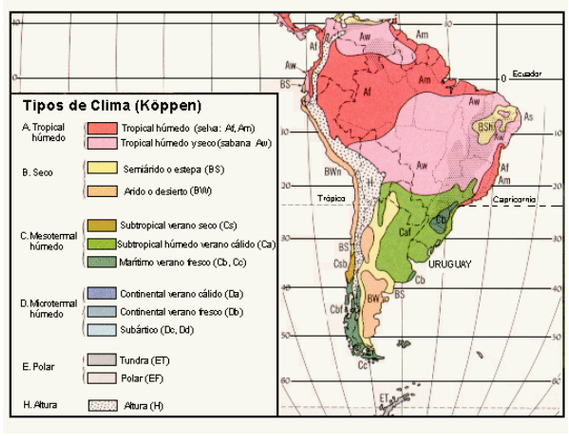


Figure 2: *Köppen climate classification system (Source: DNM - National Meteorological Office)*

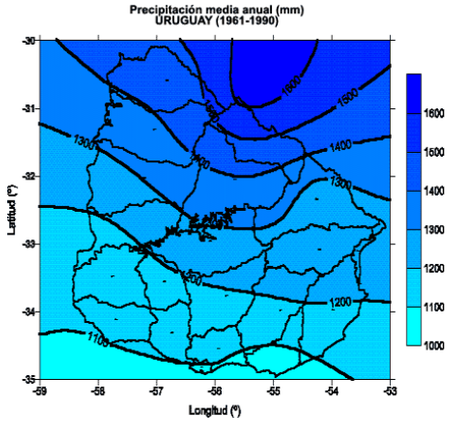
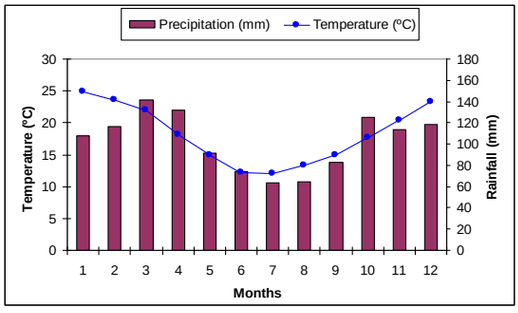


Figure 3: *Uruguay annual average precipitation (mm) (1961-1990) (Source: DNM).*



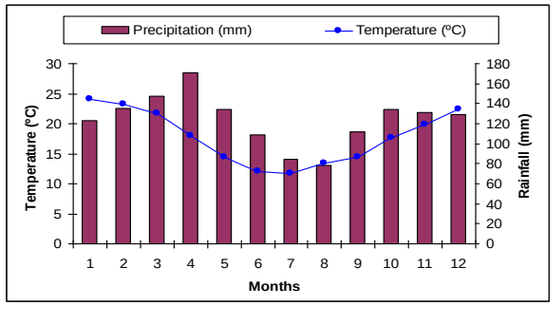


Figure 4: *Climate diagram (Climagraph) for both regions, showing median precipitation and temperature throughout year. (Source: DNM).*

Geo-Network of Latinamerican-German Alumni

DAAD Deutscher Akademischer Austausch Dienst
German Academic Exchange Service

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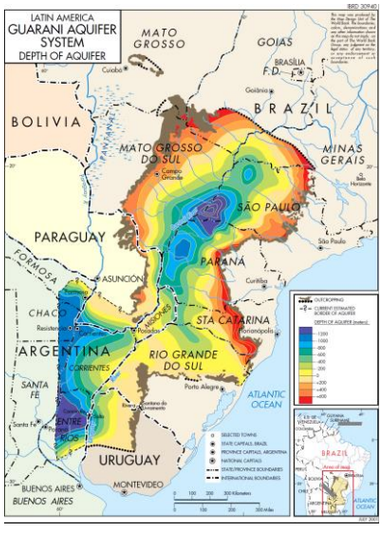

Figure 5: *The Guarani aquifer.*
Brown: outcrop in Uruguay - Tacuarembó Formation. Pink zone: thinner, fractured basalts on high ground where some indirect recharge is thought to also take place.
Source: World Bank

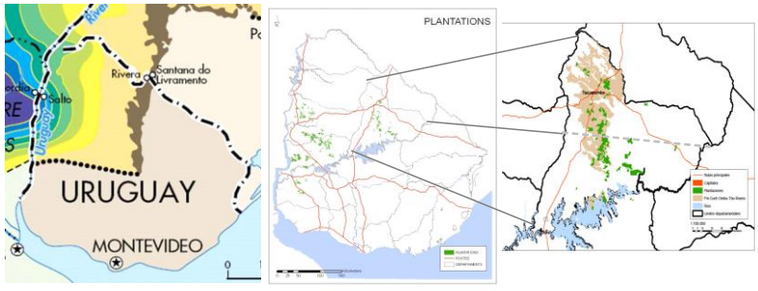

Figure 6: *FO plantations located on the Uruguayan portion of the recharge zone*

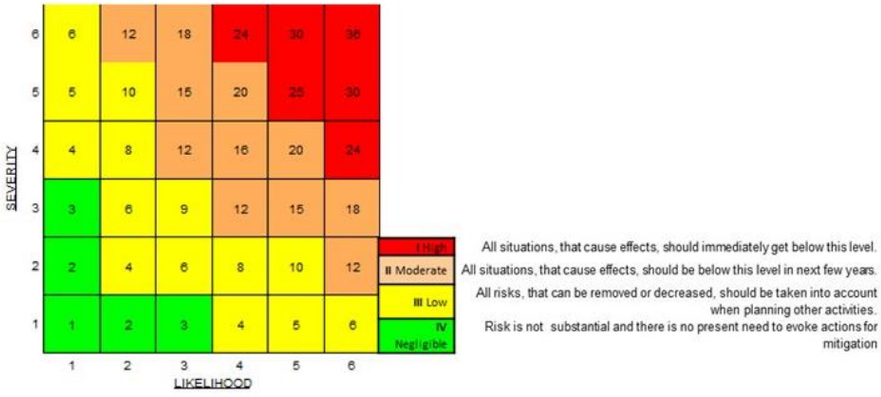

Table 1: Risk estimate matrix

Likelihood/ Severity	Description of likelihood	Description of severity
1	**Extremely unlikely,** not ever expected to occur.	**No effect**, no identifiable impact on assets.
2	**Very rare**, could occur once during facility life, 1/1000yrs.	Intermittent impacts on assets but tolerable
3	**Low likelihood**, could occur during facility life given scale of operation	Identifiable impacts on assets
4	**Possible**, could occur once in ten years, 1/10yrs.	Persistent and occasionally severe impacts on assets
5	**Probable**, could happen annually, 1/yr	Severe impacts on assets.
6	**Regular**, could happen as often as ten times per year, 10/yr.	**Total loss** of flow **permanently/irreparably damage** assets and possibly leads to total loss.

3. International Scientific Events

IV CONGRESO PARAGUAYO DE RECURSOS HIDRICOS

Information provided by Carmen Rojas, GOAL's National Coordinator Paraguay, *cadirojas@hotmail.com*

3 al 7 de agosto de 2015
Asunción - Paraguay
"Gobernabilidad del agua y Desarrollo Sostenible"

La Asociación Paraguaya de Recursos Hídricos (APRH) en forma conjunta con la Universidad Nacional de Asunción (UNA) invitan al IV Congreso Paraguayo de Recursos Hídricos a realizarse en el Campus Universitario de San Lorenzo los días 3 al 7 de agosto del 2015. El lema, que representa el tema central del Congreso, busca poner como AGENDA PAIS la necesidad de desarrollar y modernizar la gobernanza del agua, mayor riqueza de nuestro país, necesaria para el Desarrollo Sostenible ante el acelerado crecimiento que se espera para los próximos años.

Los Ejes temáticos del Congreso son:

1. Marco jurídico y responsabilidad institucional
2. Cambio Climático y Recursos hídricos
3. Agua y Economía
4. Agua y Sociedad
5. Hidrología e Hidráulica
6. Navegación
7. Hidrogeología
8. Agua y Ciudad
9. Calidad del agua
10. Recursos Hídricos
11. Salud y Agua
12. Aguas Transfronterizas

El evento comprenderá las siguientes actividades:
1. Ponencias de trabajos técnicos (en sesiones de diapositivas y posters).
2. Ponencias de instituciones invitadas (en sesiones de diapositivas).
3. Expo Agua de empresas e instituciones vinculadas al agua.
4. Conferencias técnicas por expositores nacionales como internacionales.
5. Paneles y talleres participativos

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6. Mini Cursos Pre-Congreso

Las Fechas importantes a tener en cuenta son:

15/01/2015 al 15/03/2015 – Presentación de Resúmenes
15/04/2015 – Aceptación de Resúmenes
15/05/2015 – Presentación de Trabajos completos – Cierre
15/06/2015 – Aceptación final de trabajos completos
3 y 4/08/2015 – MINI CURSOS
5, 6 y 7/08/2015 – CONGRESO

Mas información: *www.aprh.org.py*

Other scientific activities:

World Geothermal Congress, Melbourne, Australia, 19-24 April 2015. More information: *http://wgc2015.com.au*

International Conference on Recent Advancements on Geology, Florida, USA, 22-23 June 2015. More information: *http://geology.conferenceseries.com*

International Geoscience and Remote Sensing Symposium 2015, Milan, Italy, 26- 31 July, 2015. More information: *http://www.igarss2015.org*

6th International Conference on Medical Geology, Lisboa, Portugal , 26 July - 1 August 2015. More information: *http://medgeo15.web.ua.pt*

XIX INQUA 2015 congress in Nagoya, Japan on Paleoseismology and Active Tectonics, 27 July - 2 August. More information: *http://convention.jtbcom.co.jp/inqua2015/session/t05*

Our homepage is under construction.
If you have any question or comments
about our Newsletter, please contact
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Reviewed by: Prof. Reinaldo García,
Regional Coordinator - GOAL, *rgarcia1945@yahoo.es*