

BRIEF CURRICULUM VITAE

NAME: GRACIELA ISABEL METTERNICHT, B.SC., MSC,
PHD (*SUMMA CUM LAUDE*)

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CURRENT POSITION: Director and Professor, Institute of
Environmental Studies (2012 – present)
FACULTY OF SCIENCES,
UNIVERSITY OF NEW SOUTH WALES
SYDNEY NSW 2052 - AUSTRALIA

EMPLOYMENT RECORD:

- 2008 - 2012 **United Nations Environment Programme**
Position: Regional Coordinator (Latin America and
The Caribbean), Environmental Assessment and Early
Warning
Description of duties: planning, direction and
implementation of projects associated to early
warning and environmental assessment in Latin
America and the Caribbean; develops a network of
partnerships with governments (policy guidance) and
expert institutions (technical expertise) for carrying
out specific activities; coordinates and guides data
collection activities and facilitates the
development of datasets containing environmental data.
- 2007 - 2008 **University of South Australia**, School of Natural and Built Environments, Division of
Information Technology, Engineering and the Environment, Adelaide, Australia
Position: Head of Discipline and Professor, Geospatial Systems and Environmental
Management.
Description of duties: Discipline leader, research, teaching undergraduate and postgraduate
courses, assistance in curriculum development.
- 1996 - 2007 **Curtin University of Technology**, Division of Resources and Environment
Position: Professor of Geospatial Science
Description of duties: Coordinator of Postgraduate Studies; teaching and supervision of
undergraduate and postgraduate students, development and management of undergraduate
and postgraduate course curriculum, research and consultancy in areas of remote
sensing/GIS applications for natural resource assessment and land planning.

EDUCATIONAL QUALIFICATIONS:

- 1993- 1996 Doctor of Philosophy (Physical Geography) *suma cum laude*.
Institution: State University of Gent, Belgium.
- 1992 Master of Sciences in Integrated Map and Geo-information Production.

Professor Graciela Metternicht is a leading international authority on sustainability and environmental management, with a focus on land degradation. She has a special interest in geospatial technologies for the management and analysis of natural resources and coordinates and supervises within the UNSW Institute of Environmental Studies (IES) Postgraduate Research Environmental Management degrees.

Professor Metternicht has published widely in international journals, has attracted significant research funding through Australian competitive grants (including ARC), international grants and research contracts and acts as a Visiting Professor at environmental institutions around the world.

Prior to joining UNSW, Professor Metternicht was Regional Coordinator of Early Warning and Assessment of the United Nations Environment Programme (UNEP) for Latin America and the Caribbean.

Institution: International Institute for Aerospace Survey and Earth Sciences (ITC), Enschede, The Netherlands.

1991 Postgraduate diploma in Cartography (with distinction).
Institution: International Institute for Aerospace Survey and Earth Sciences (ITC), Enschede, The Netherlands.

1985 Perito Topo-Cartografo (Universidad Nacional del Litoral), Santa Fé, Argentina.

POSITIONS AS VISITING PROFESSOR:

Switzerland: Institute for Cartography, Swiss Institute of Technology, Zurich (ETH)	2004-2005
Spain: Department of Geography, University of Alcalá, Alcalá de Henares, Spain	2005
Japan: Centre for Global Environmental Research, National Institute for Environmental Studies, Environmental Agency of Japan, Tsukuba	2001
South Africa: Institute for Soil, Climate and Water, Agricultural Research Council, Pretoria	2005
China: Institute for Remote Sensing Applications (IRSA), Chinese Academy of Science, Beijing	1999

PRIZES AND AWARDS

1. Honorary Fellow, International Cartographic Association (2007)
2. Award for Best Teaching Practice, Division of Resources and Environment
3. Outstanding Women of the Year in Non-Traditional Areas of Work and Study 2000 (Finalist, National Award)
4. The Science and Technology Agency of Japan, awards for scientists 2001-2002
5. Australian Academy of Science, China Exchange Program 1999-2000: travel award
6. Dean's Medallion for Research, Division of Engineering and Sciences (1998)
7. The Rural Industries Research and Development Corporation: travel award (1997)
8. Netherlands Fellowship Program grantee (1991 – 1996)
9. The European Association of Remote Sensing Laboratories: travel award (1993)
10. The European Community: conference travel award (1995)
11. Cited in the Who's Who in the World (1998-2006)

PROFESSIONAL ACTIVITIES

1. Member, Australia Research Council College of Experts (2014-2016).
2. Fellow, International Cartographic Organisation
3. Member of the Institute of Electrical and Electronics Engineers (IEEE), Geoscience and Remote Sensing.
4. Fellow, Surveying & Spatial Sciences Institute (SSSI) in Australia.
5. Member, IUCN (International Union for Conservation of Nature) Commission on Ecosystem Management
6. Member, Australia-India Strategic Research Fund (AISRF) Advisory Panel (2013)
7. Scientific reviewer for: Journal of Applied Remote Sensing; European Journal of Soil Sciences; Earth Science Informatics; International Journal of Remote Sensing, Remote Sensing of Environment, Environmental Modelling and Software, ISPRS Highlights, Catena.
8. UNCCD (United Nations Convention to Combat Desertification): scientific reviewer, "A scientific approach for monitoring and evaluation of the UNCCD 10-year strategy" 2014.

9. UNEP (United Nations Environment Programme): reviewer “GEO-5 for Business”; “Sustainable, Resource Efficient Cities –Making it Happen!” – 2012.

INVITED PRESENTATIONS (SELECTED):

Metternicht, G. (2013) Understanding the impacts of extractive industries on soils. Global Soil Week 2013: Losing Ground?, Berlin, Germany, 27-31 October. [partially funded]

Metternicht, G. (2006) Use of remote sensing and GNSS in precision agriculture. United Nations/Zambia /European Space Agency Regional Workshop on the Applications of Global Navigation Satellite System Technologies in Sub-Saharan Africa, Zambia, Lusaka, 26 - 30 June 2006. [partially funded]

Metternicht, G. (2006) Current developments of remote sensing for mapping and monitoring land degradation at regional scale. United Nations/Zambia /European Space Agency Regional Workshop on the Applications of Global Navigation Satellite System Technologies in Sub-Saharan Africa, Zambia, Lusaka, 26 - 30 June 2006. [partially funded]

RESEARCH FUNDING :

Title: UNEP Sustainability for metals mining and management initiative (2012-2013)-

Aims: To formulate a strategy and background document for the development of an Initiative on sustainability for the metals and mining sector management, as well as to carry out an initial consultation to identify priorities of intervention for UNEP within the framework of such initiative.

Determine factors which underpin the most effective programs directed towards improving sustainability in the mining and metals value chain, in order to guide the new UNEP Sustainability for metals mining and management initiative and forthcoming projects to be carried out under the initiative...

Position: chief investigator (with Prof R Taplin).

Sponsor: United Nations Environment Programme.

Title: PLAGA: Pastoral Lease Assessment using Geospatial Analysis (2008-2011)

Aims: To improve the capacity of Natural Resource Management (NRM) and land administration agencies to record, monitor and communicate changes in land condition across the large spatial scales characteristic of rangelands. Pastoralists also benefit through improved capacity to promote, defend, understand and if necessary change their management activities on the basis of scientific data.

Position: Metternicht designed and wrote the research proposal. It could not implement given her appointment to United Nations.

Sponsor: Australian Research Council – Linkage Scheme. AUD 528,000.

Title: Dynamics of animal mediated vegetation establishment and persistence in disturbed landscapes (2007-2010)

Aims: To examine the role of herbivory and seed dispersal-limitation in controlling restoration success following post-fire and post-mining disturbances. GIS/remote sensing and spatial analysis and modelling will be employed in site selection and habitat characterisation

Position: Chief investigator (with Lamont, Majer and Parsons from Curtin University) Metternicht contributed to the design of this research. It could not implement given her appointment to United Nations.

Sponsor: Australian Research Council – Linkage Scheme. AUD 543,000

Title: Support for knowledge transfer on Spatial Modelling and GIS techniques for Natural Resources Survey.

Aims: Design of a short course curricula for capacity building on the use of GIS and spatial modelling for natural resource survey, including theoretical and practical training materials, delivery of the course and evaluation of results. Part of the project “Improvement of the Cartographic Systems of the Colombian Territory.” (COL/B7-3100/IB/98/0257)

Position: Project leader

Sponsor: European Union and the Colombian Government. A\$ 13,000

Title: **Development of New Generation Tools for Regional-Scale Mapping of Noxious Weeds (2004-2007)**

Aims: Determining the potential of new remote sensing and analytical tools for cost-effectively mapping weed infestations. We envisage integrating high resolution air- and satellite-borne technology, GIS and GPS, so that weeds' distribution and spread over time can be mapped efficiently.

Position: Project leader and Chief Investigator

Sponsor: *Australian Research Council.* A\$ 150,000

Title: **Remote sensing tools for enhanced agricultural and resource condition assessment and management at farm and paddock level (2004-2007)**

Aims: Develop operational tools for mapping and monitoring agricultural and resource conditions so that timely assessments, enabling landholders to make informed management decisions at the farm and paddock level, can be achieved. Such tools should build towards the development of operational systems to track progress towards the goal of delivering economically and environmentally responsible agricultural systems.

Position: Project leader

Sponsor: *Cooperative Research Centre for Spatial Information, Australian Research Council.* A\$ 400,500

Title: **Peat swamp usage for agricultural crops. A feasibility study on the potential of remote sensing techniques for identifying and mapping peat soils in Sarawak (2005-2008)**

Aims: This project will complement current research on peat soils undertaken at the Department of Agriculture of Sarawak, so that the spatial distribution and extent of peat soils can be readily mapped and assessed in terms of its land use capabilities.

Position: Project Leader and Chief investigator.

Sponsor: *Government of Sarawak (Malaysia).* A\$ 415,546

Title: **Collaborative Planning Support Tools for Optimising Farming Systems (2001-2004)**

Aims: The project proposes integrating high resolution digital multispectral images, GIS and multi-criteria decision analysis techniques to help farmers use input appropriate to the productive capacity of their paddocks, and to elaborate sound farm planning based on the potential of the land for specific land uses.

Position: Chief investigator.

Sponsor: *Australian Research Council (SPIRT scheme), Agriculture Western Australia.* A\$580,000

Title: **Development of Flexible Teaching methods for Technology-based Disciplines (2002-2003)**

Aims: Develop new tools for flexible learning in the careers of Surveying, Mine Surveying, GIScience and Cartography

Position: Partner Investigator

Sponsor: *Curtin University of Technology, LEAP scheme,* A\$223,000.

Title: **Expanding Distance Education in the Spatial Science (2001)**

Aims: Distance On-line Flexible Learning Initiative to implement larger number of units part of programs of the GIScience and Cartography career as on-line and distance components.

Position: Partner Investigator

Sponsor: *Curtin University of Technology, DOFL scheme,* A\$30,000

Title: *Improved land use mapping and change detection analysis for environmental studies using multi-scale remotely sensed data and advance image processing techniques* (2001)

Aims: Evaluate the effects of temporal, spatial and spectral resolution of advanced remote sensing techniques on mapping and monitoring land use and its changes over time

Position: Partner Investigator with Prof Yamagata of the National Institute for Environmental Studies (Japan).

Sponsor: Department of Industry, Science and Resource Technology of Australia, and the Japan Science and Technology Agency. A\$ 15,000.

Title: *Rapid farm level soil mapping system using remote sensing techniques* (2001)

Aims: Produce a protocol for rapid mapping of soils and land characteristics at a scale detailed enough for extension officers to plan and advise farmers receiving land under the Farmer Resettlement and Agricultural Development Program to use the newly acquired land to its best ability (from an economic and sustainable exploitation perspective).

Position: Partner investigator with staff of the Institute for Soil, Climate and Water, Pretoria, SA.

Sponsor: Funded by the Agricultural Research Council of South Africa. Approx. 170,000 rand (A\$42,000)

Title: *Rapid Assessment and Monitoring of Vegetation Degradation in Agricultural Landscapes* (1999-2001)

Aims: To evaluate methods and techniques to produce a reliable, cost-effective and practical system for assessing and monitoring the conditions of crops and native forest in agricultural landscapes using remote sensing and GIS. Aspects related to rapid dissemination, output information and effective ways to provide reports to land managers and other users are analysed as well.

Position: Chief Investigator/Team Leader

Sponsor: Australian Research Council (SPIRT scheme), Agriculture Western Australia and SpecTerra Systems Pty Ltd). A\$ 480,000 (cash and in-kind).

Title: *Land Degradation mapping and hazard prediction using data of the Envisat-1 satellite*

Aims: To identify and characterise indicators capable of being detected using data of the ASAR (Advanced Synthetic Aperture Radar) sensor, being suitable to map and monitor land degradation processes due to salinisation.

Position: Team leader/Principal Investigator.

Sponsor: European Space Agency. Approx. A\$ 20,000

Title: *Remote Sensing Indicators to Detect Early Degradation of Vegetation in Rangelands and Agricultural Landscapes* (1999)

Aims: To detect indicators of land degradation at regional scale using SAR data.

Position: Chief Investigator, in collaboration with staff of the Institute of Remote Sensing Applications (Chinese Academy of Sciences).

Sponsor: Australian Academy of Sciences, within the frame of the China Exchange Program. A\$ 10,000

Title: *Feasibility study on the use of satellite remote sensing technologies for digital topographic map and database updating at medium and large scales* (1998)

Aims: Critical assessment of the potential of satellite remote sensing as a tool for topographic map updating. The outcomes included a report presenting alternative methodologies for updating digital databases at 1:50,000/1:100,000 and 1:25,000 map scales.

Position: Chief investigator.

Sponsor: Department of Land Administration of Western Australia. A\$ 50,000

INTERNATIONAL EXPERIENCE IN SCIENTIFIC ADVICE TO POLICY-MAKERS AND GLOBAL OUTLOOKS

2012: **The 5th Global Environment Outlook (GEO-5)**, UN Environment Programme. Coordinator of the Chapter “Policy options: Latin America and the Caribbean”. The chapter analysed and presented policies considered to have the highest potential for increasing environmental sustainability and associated human well-being. A number of interrelated themes were selected by regional stakeholders as priorities: environmental governance; water management; biodiversity; soil, land use, land degradation and desertification; and climate change. [4 years]

2012: Prepared and presented the document on “Emerging Environmental Issues for Latin America and the Caribbean” at the **18th Meeting of the Forum of Ministers of the Environment** of Latin America and the Caribbean, Quito, Ecuador; 31 January - 3 February 2012.

2010: Scientific and technical advisor for the “**National Environmental Summary (NES)** for Belize, Costa Rica, Grenada, St Lucia, Antigua and Barbuda, St Kitts and Nevis, El Salvador, Peru, Guyana, Barbados, Dominica, St Vincents and the Grenadines, developed by UNEP. The NES served as an information tool to support the incorporation of environment as a thematic component into the United Nations Common Country Assessment (CCA) and the United Nations Development Assistance Framework (UNDAF) initiatives. This environmental summary is intended to provide a critical analysis of gaps and opportunities that exist within policies, programmes and the national legislative framework all of which are used to address the major environmental issues within the context of poverty reduction and development.

2008-2010: Led the production of the **3rd Latin America and the Caribbean Environment Outlook (GEOLAC-3)**; a UNEP’s contribution to catalysing improvements to human well-being and framing a fresh debate around the concept of sustainability. The document provided accurate and reliable information on the state of the environment as well as policies and options for action to address complex environmental issues of the LAC region.

2008-2010: Metternicht co-led the production of the **LAC Atlas of Our Changing Environment**, the first regional effort to analyse the changes taking place in the region’s environment, combining precise and striking satellite images with analysis based on rigorous data. The Atlas is an indispensable tool in formulating the future actions and public policies needed to achieve more sustainable development in the region. It was a joint UNEP- Centro del Agua del Trópico Húmedo para América Latina y el Caribe (CATHALAC) initiative.

SUMMARY OF PUBLICATIONS

Professor Metternicht has widely published her research, and at the time of writing (April 2014) since 1996 she has authored or co-authored 39 papers in refereed international journals, 81 papers in conference proceedings, 8 book chapters, and edited one book. From the 78 publications included on Google Scholar (11/04/2014) she has 1712 citations with a *h-index* = 19, and a *h-10 index* (an expression of the number of publications with at least 10 citations) of 27. Her 2003 paper “Remote sensing of soil salinity: potentials and constraints” from Remote Sensing Of Environment (Impact Factor of 6.144, Geoscience category) has since been cited about 20.22 times a year. Furthermore, this same article has 364 Google Scholar citations, and it has been amongst the top 25 hottest articles of this Journal over the last 8 years, ranking has varied from No1 to position 19; and so it has also been with publication ‘Remote sensing of landslides: An analysis of the potential contribution to geo-spatial systems for hazard assessment in mountainous environments’, since year 2005.