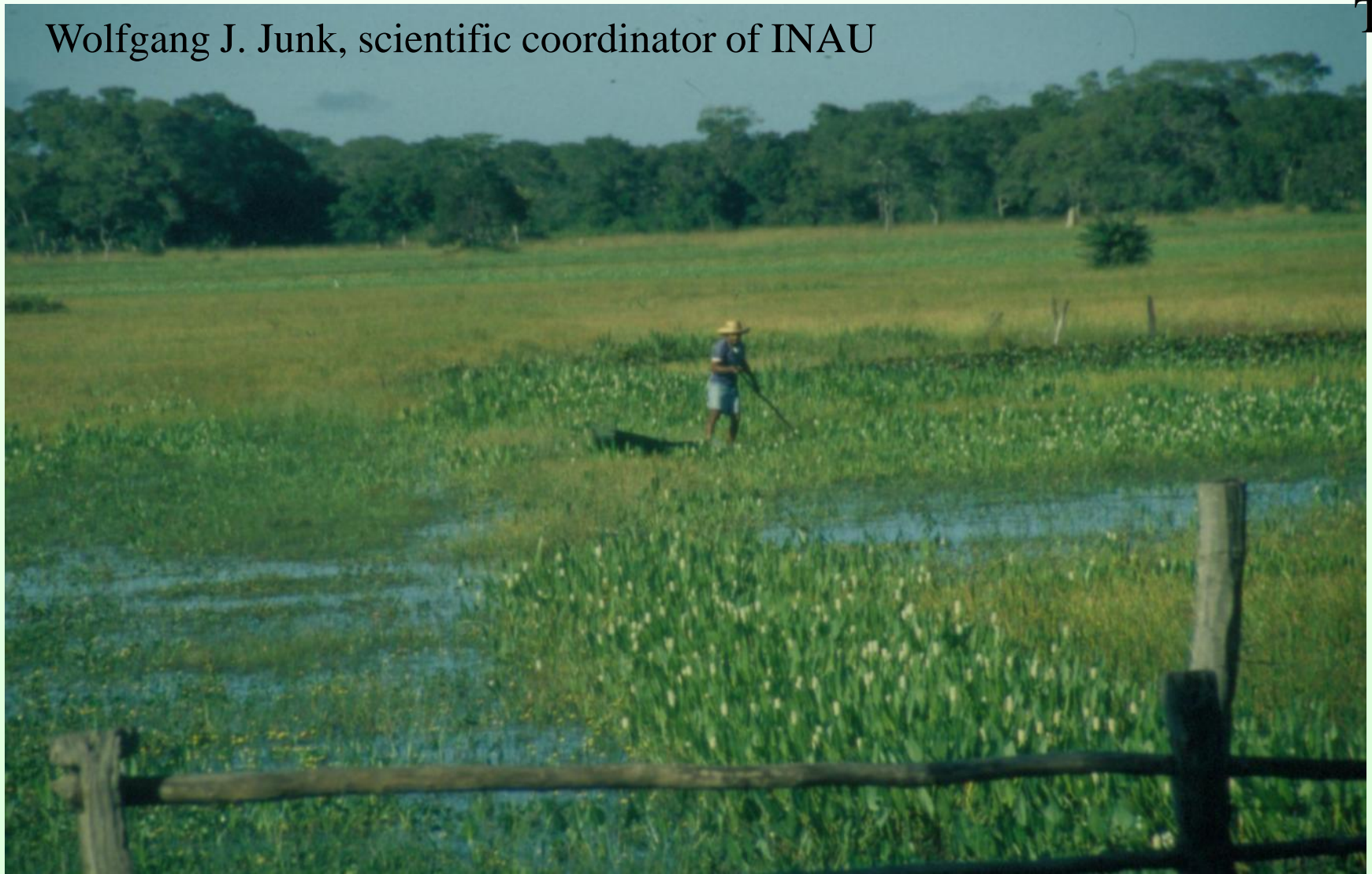# An Integrated approach for Sustainable Use of Wetlands: The National Wetland Institute (INAU) in Cuiabá, Brazil: Structure and Research Program

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Wolfgang J. Junk, scientific coordinator of INAU

According to **Carlos Alberto Aragão de Carvalho Filho,** President of CNPq, the *"Program National Institutes for Science and Technology (INCT), launched in July of **2008**, was established as a powerful instrument for the progress of Science, Technology and Innovation of the country".*

122 INCTs were approved.

Distribution of INCTs in Brazil

General Mission

- Establishment of a network of research institutes working on science and technology in Brazilian wetlands

-Elaboration of projects of common interest and collaboration in its realization.

- Collaboration in the formation of human resources by the exchange of professors and students.

Principal objectives I

- Delimitation of the four large wetlands Pantanal, and the Paraná, Araguaia and Guaporé River floodplains

- Characterization and classification of their habitats

- Description of their functions and interactions

- Elaboration of proposals for the sustainable management of their resources, the protection of their habitats, including their biodiversity, to improve quality of life of the traditional population, living in these areas.

Principal objectives II

- Studies about alternatives for the use of biodiversity, e.g., production of phyto-medicines and natural biocides;

- Elaboration of criteria for decision makers to reach the objectives of sustainable management;

- Contribution for the formation of high-level scientists and technical stuff for wetland research and management ;

INAU in Brazilian context

INAU is the only institute working about habitat classification, habitat interaction and management in wetlands of the Cerrado belt. This position will be reinforced by the construction of the new National Institute of Pantanal Research at UFMT.

In Central Amazônia, scientists of MAUA project at INPA work about the classification of wetlands and their habitats, using the same approach as INAU.

At Paraná River, scientists of NUPELIA cooperate with INAU about the same aspects with the same approach.

INAU in Brazilian context (cont.)

INAU, INPA and NUPELIA cover all large Brazilian wetland complexes, excluding only mangroves and coastal wetlands.

The common scientific approach will provide a unique basis for comparative wetland studies of the large Brazilian wetland complexes and provide a powerful basis for their management and legal treatment.

INAU, as part of a research network, is open for collaboration with other interested national and international research groups.
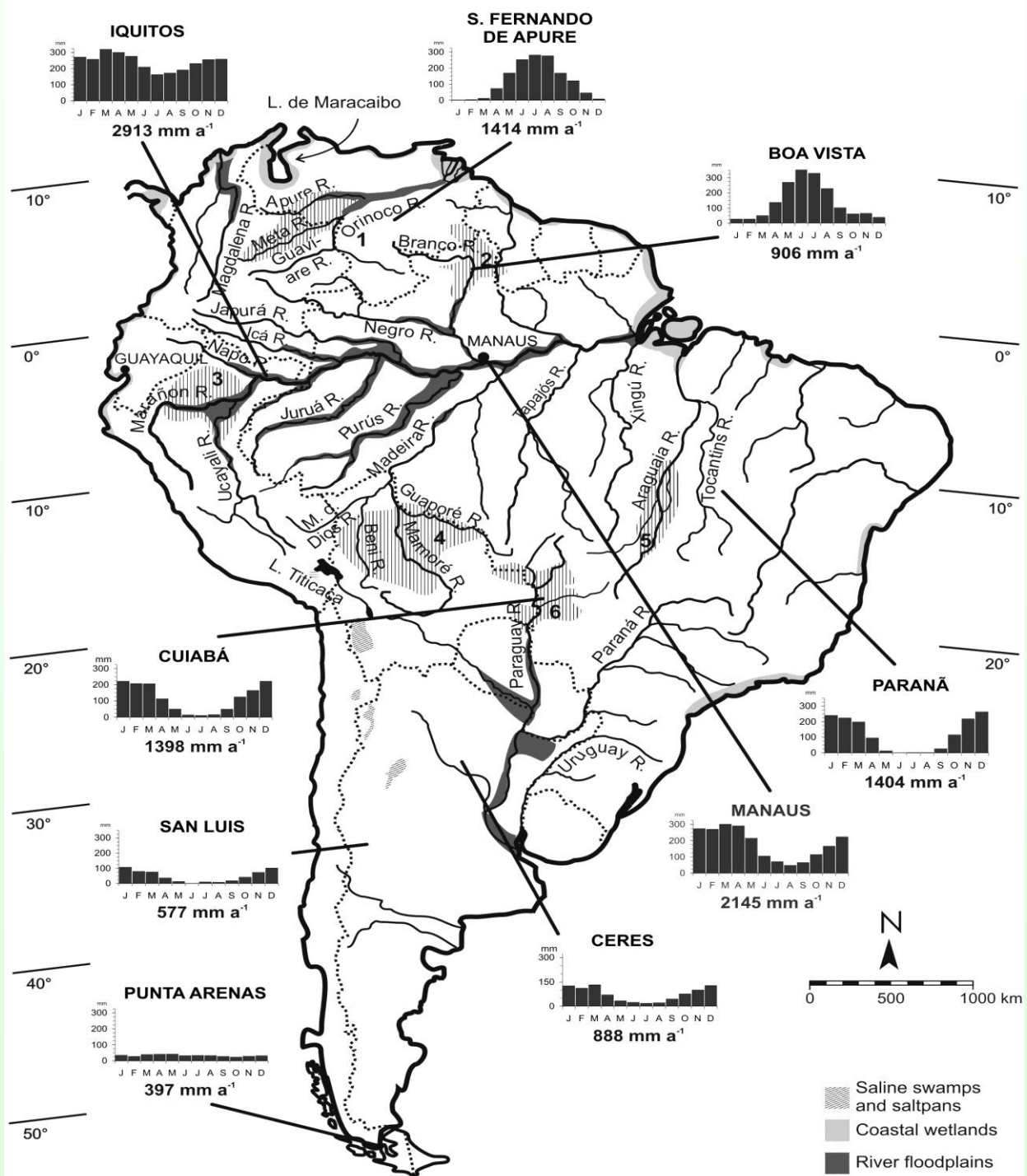
International collaborations

- Florida International University (USA);
- University of Bonn (Germany),
- Universidad Nacional de San Martin (Argentina),
- Universidad Talca (Chile)
- The UNEP's Millennium Ecosystem Assessment
  Sub-Global Program; UNU-IAS

The four presentations of this session will show different aspects of the research approach of INAU, to stimulate discussion and cooperation with the international wetland-research community.

Thank you for your attention

Habitat Classification of Wetlands: a Powerful Tool for Research, Management and Protection

By

Wolfgang J. Junk,

INCT-INAU / UFMT,

Wetland habitat Classification Systems

Ramsar Convention (RCS) (Scott & Jones 1995)

U.S. Fish and Wildlife Service (USFWS) (Cowardin et al. 1979)

Scientific Committee on Problems of the Environment (SCOPE), (Gopal et al. 1990),

Geomorphic Classification System (Semeniuk & Semeniuk 1995)

And many others

Short-comes of these classifications

They do not differentiate between wetland systems of different size and complexity levels. A large river-floodplain is treated like a riparian stream wetland.

Parameters for an universal approach for a wetland habitat classification

1 Climate

2 Hydrology

3 Physical and chemical properties of water and soils

4 Biological criteria (communities of higher plants)

Habitat diversity of Brazilian Wetlands

Classes	Functional units		
	Pantanal[1]	Amaz. Várzea[2]	Paraná[3]
Perm. Aquat. Sys.	12	12	5
Interm. Aquat. Sys.	4	4	2
Perm. Terr. Sys.	6	4	4
Interm. Terr. Sys.	24	12	11
Swamp Sys.	7	3	2

[1]Nunes da Cunha & Junk 2011, [2]Junk et al. submitted, [3]Junk et al. in prep.

Scientific benefits of a habitat classification:

Habitat diversity is a parameter for the determination of wetland complexity

Habitat classification allows

1. determination of habitat extent and distribution

2. determination of specific services, such as contribution to biogeochemical cycles, biomass, primary production, biodiversity, etc

4. determination of habitat dynamics in time and space

5. description and quantification of interactions between the habitats

6. determination of the impact of environmental factors on the habitats (fire, extreme floods and droughts, sediment load, human impacts, climate change, etc.)

7. It provides a sound scientific basis for comparative studies with other wetland systems

Practical benefits of a habitat classification:

- 1. description and quantification of specific renewable resources for men

- 2. determination of major threats

- 3. determination of resilience to environmental changes and human impact, including climate change

- 4. determination of the importance for environmental protection

- 5. basis for a legislation to regulate management and protection

Conclusions I

1. Large wetlands are complex ecosystems, with a large number of habitats (or functional units)

2. These habitats are subjected to different hydrological and edaphic conditions

3. They fulfil different functions in the wetland complex and harbour different plant and animal species and communities

Conclusions II

4. There exist multiple and complex interactions between the habitats including their flora and fauna, which have to be considered when describing wetland structures and functions

5. Habitats also provide different services to the local human population and require different management practices

6. Habitat delineation, characterization and classification is the basis for comparative studies and sustainable wetland management and protection

Thank you for your attention!