



Water Governance and the Regulation of Water Use in Brazil and in the Pantanal

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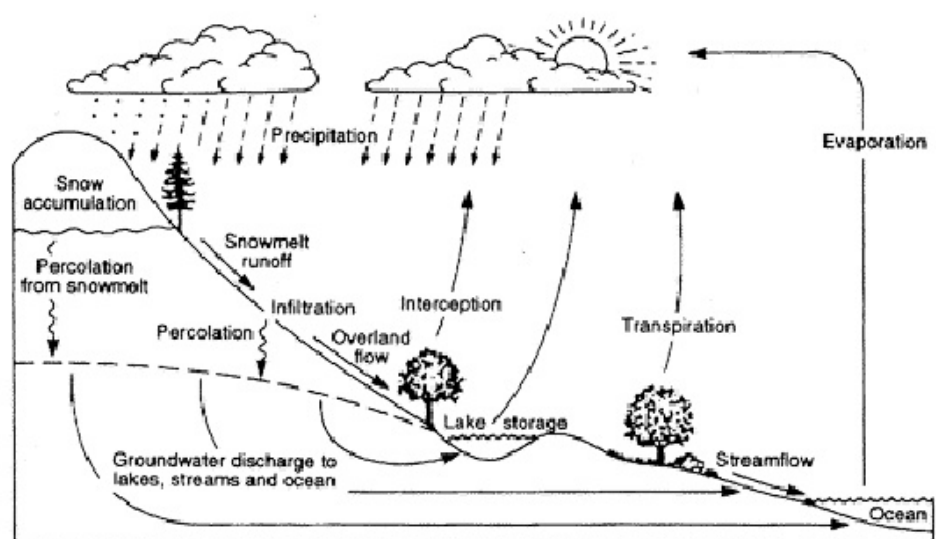
Presentation Structure



- Some concepts related to water governance
- Institutional water reforms in Brazil
- Institutional water reforms in the Pantanal
- Water governance in the Pantanal: Achievements and future demands

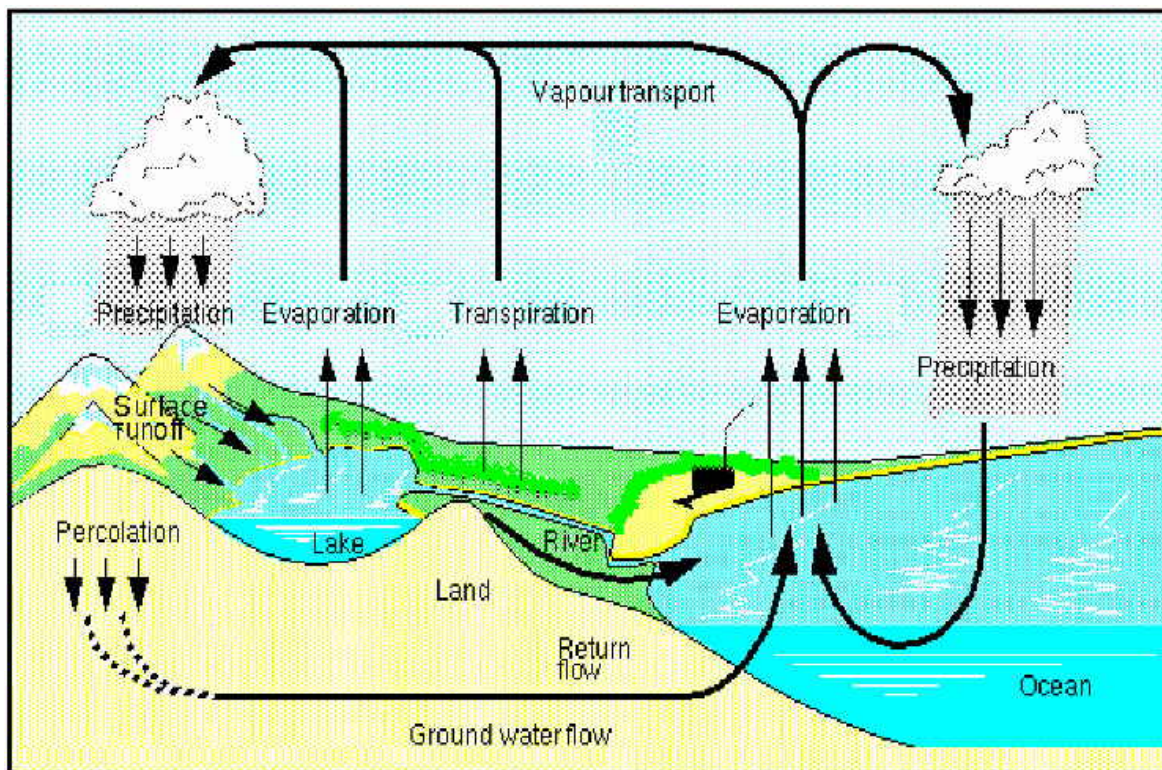
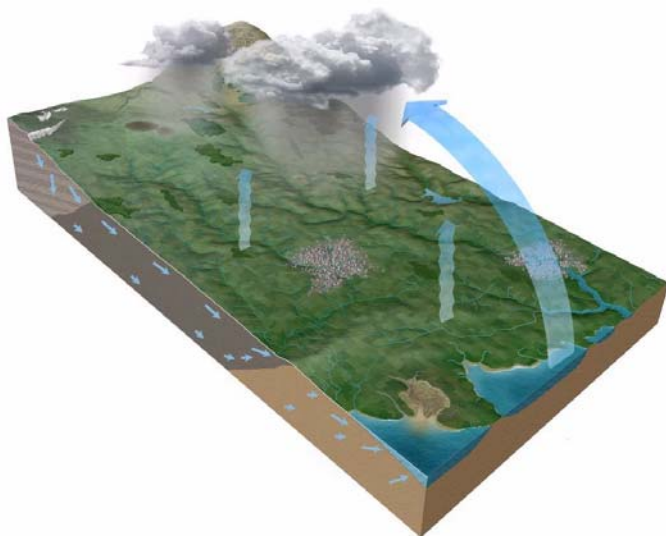
The conspicuous problems of bad water management...



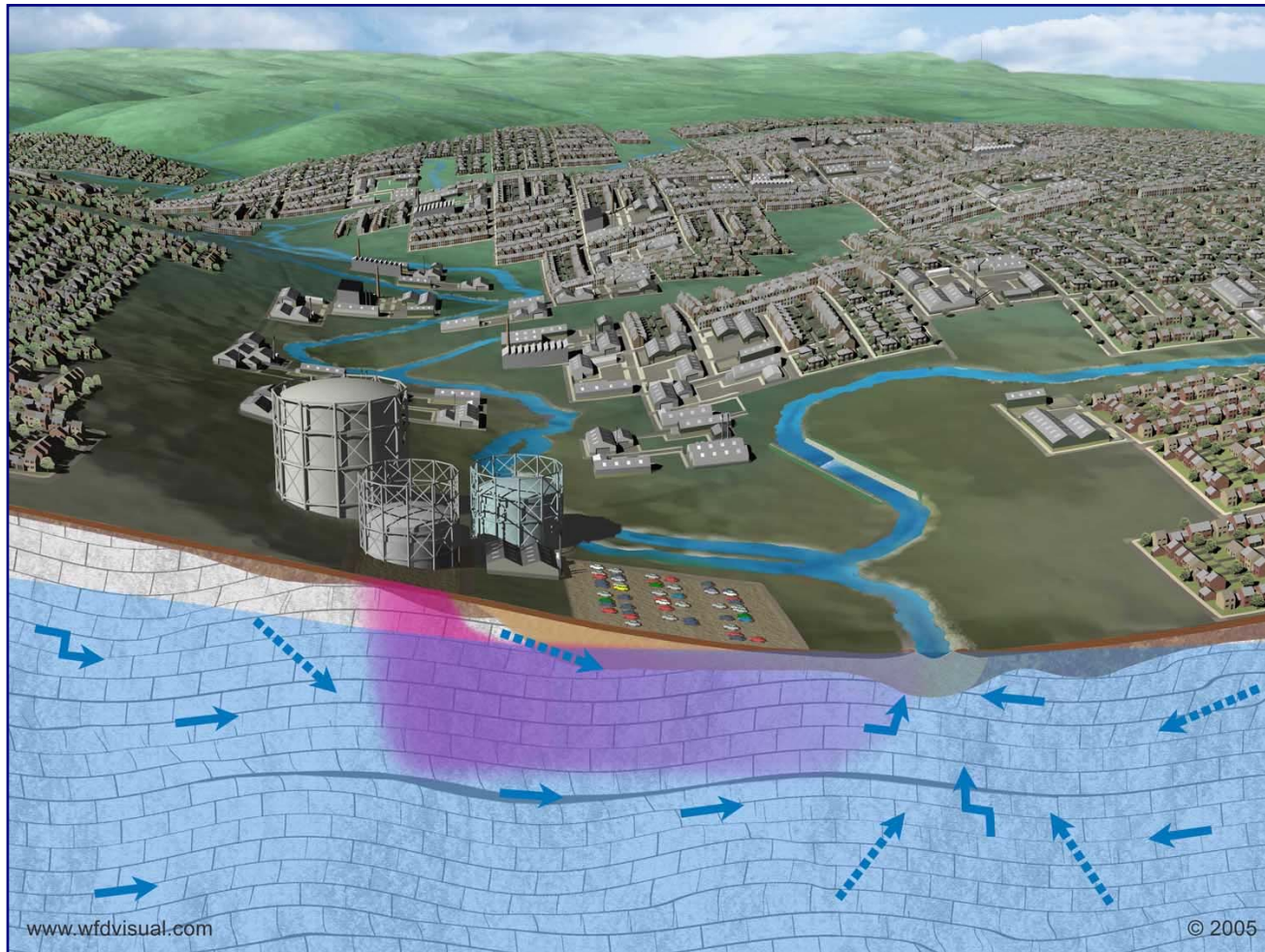


Source: ANZECC & AWRC

Conventional representations of the water cycle...



But is it not a truly 'hydrosocial' cycle?



Water circulation (and management) as a landscape change processes



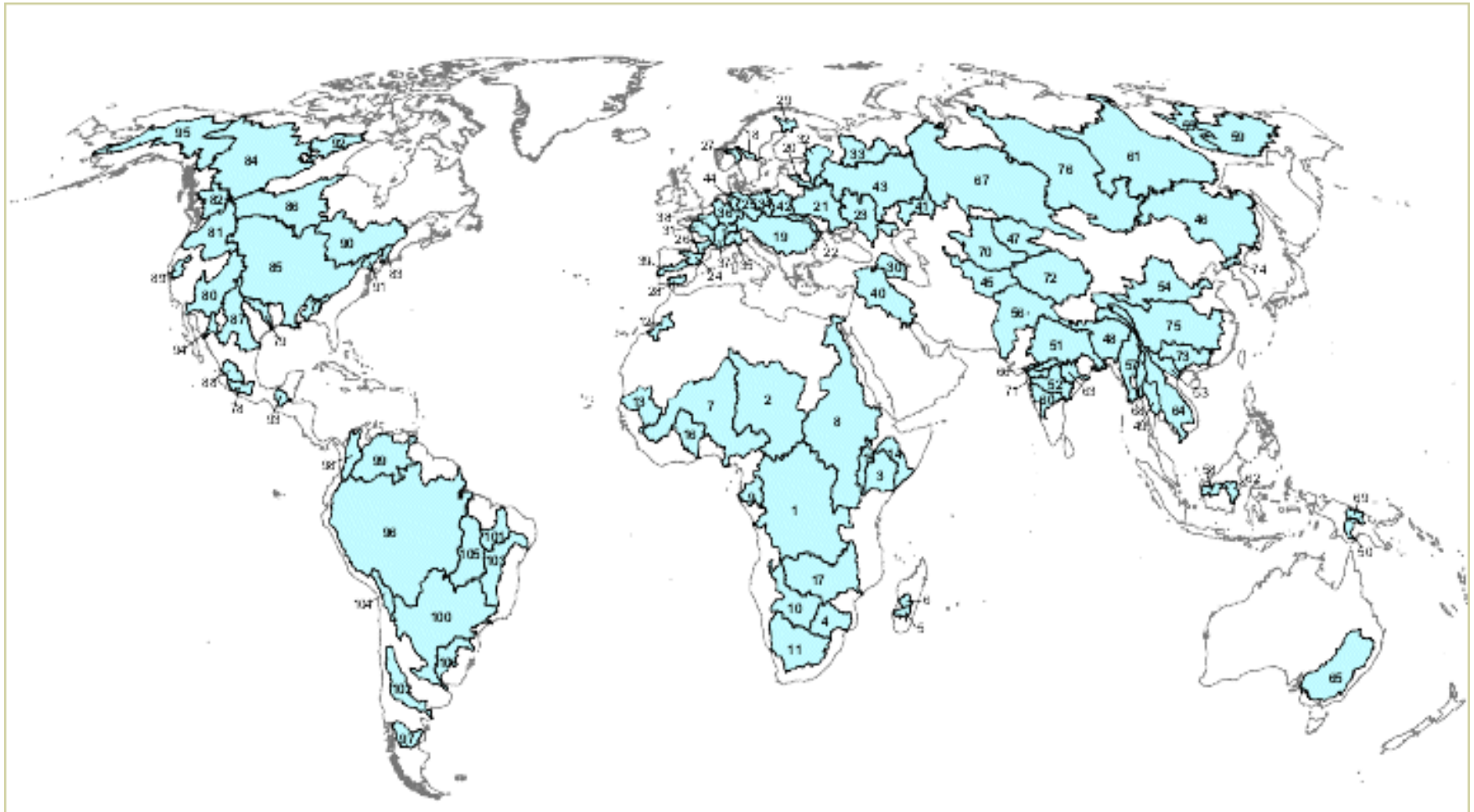
Interface between water, landscape, biodiversity and society



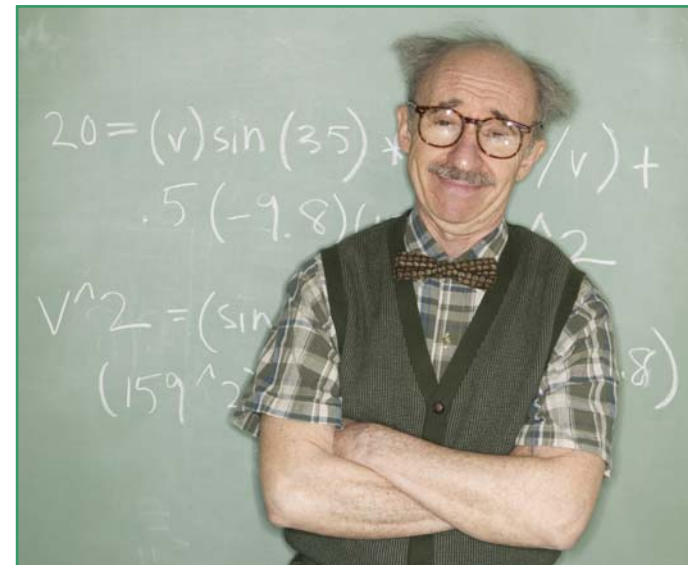
From the local dimension of water management problems...



... to the transboundary and global dimensions of water questions



Water
management
issues are
complex,
multiscale and
require
interdisciplinary
approaches



Evolution of water management institutions

- ❑ Traditional water uses, early industrialisation, urban growth (till 19th c.)
- ❑ The hydraulic paradigm (mid-20th c.)
- ❑ Water governance (instead of only government) (since end 1970s)
 - ❑ Integrated management (land/water, upstream/downstream, surface/groundwater, etc.)
 - ❑ Economic value of water (search for higher efficiency)
 - ❑ Stakeholder involvement

But... to what extent 'water governance' is really new?

- ❑ Difficulty to move from theory to practice (to address uncertainty, risks, multiple scales, multiple dimensions, different discourses and perceptions, etc.)
- ❑ Water governance is, ultimately, a state project (part of a particular historical period and applied to specific geographical circumstances)
- ❑ Path-dependency problems; remaining centralisation; emerging and pending controversies
- ❑ Superficial nature of most of the reforms, which persistently 'ignore' the asymmetries of power

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Hydrographical Regions



Evolution of the legal framework

Quadro 4.3.1: Dominalidade dos corpos d'água, competências legais e administrativas sobre recursos hídricos segundo as constituições federais brasileiras

	Domínio jurídico dos corpos d'água	Competências para legislar sobre água	Competências administrativas
Constituição de 1891	Não definido	A União e os estados podem legislar sobre navegação, sob regulação de lei federal específica. Somente o Congresso Nacional pode legislar sobre navegação em cursos d'água que banhem mais de um Estado ou se estendam a territórios estrangeiros.	Não definidas
Constituição de 1934 Código das Águas de 1934*	Águas superficiais: - Águas públicas (federais, estaduais e municipais*) - Águas particulares - Águas comuns* - Águas comuns de todos*	Competência privativa da União para legislar sobre águas e energia. Os Estados podem legislar de forma supletiva e complementar	- Competência privativa da União para explorar ou autorizar a exploração dos potenciais hidroenergéticos; - Águas públicas, particulares e subterrâneas recebem normas administrativas distintas* - Hidroeletricidade recebe tratamento diferenciado e privilegiado dentre os diversos usos da água*.
Constituição de 1937 / Código das Águas 1934	Mantido	Competências praticamente mantidas; os Estados mantêm seu poder de legislar sobre águas de forma complementar	Mantidas
Constituição de 1946 / Código das Águas 1934	Supressão de águas municipais que passam a ser de domínio dos Estados.	Mantidas	Mantidas
Constituição de 1967 / Código das Águas 1934	Mantido	Estados perdem poder de legislar sobre águas de forma complementar.	Mantidas
Constituição de 1988 / Código das Águas 1934*	Supressão de águas particulares e comuns: todos os corpos d'água passam a ser de domínio federal ou estadual Águas subterrâneas são definidas como estaduais.	Mantida a competência privativa da União e a proibição dos Estados para legislar sobre águas. Contudo, lei complementar pode autorizar os Estados a legislar de forma complementar.	A União deve se articular com os Estados para autorizar o uso da água para fins de hidroenergia. São eliminadas todas as disposições legais relativas às águas particulares e comuns. O restante continua válido*.

Fonte : (FORMIGA-JOHNSON, 1998).

Major phases of water development in Brazil

- ❑ Colonisation and early independence
- ❑ Around the turn of 20th century (dams, hydro)
- ❑ After “1930 Revolution” – large schemes promoted by the national state
- ❑ End of 1970s/1980s – early environmental legislation
- ❑ 1990s – legal and institutional reforms
- ❑ +2000s – search for new basis of water management (integration, participation, etc.)

The 1997 water legislation

- ❑ Inspired by the French and British legislation
- ❑ Objectives
 - ❑ secure long-term water availability
 - ❑ rational use of water and sustainable development
 - ❑ deal with critical events
- ❑ Principles
 - ❑ river basin approach
 - ❑ multiples uses of water
 - ❑ water is scarce and has economic value
 - ❑ decentralised and participative management
- ❑ Created the National Water Management System (SINGERH)



New Regulatory instruments

- ❑ River basin plans
- ❑ Information systems
- ❑ Classification of water bodies
- ❑ Compensation to local authorities for new water projects (e.g. dams)
- ❑ Water licences
- ❑ Water charges

(Water use licence and ecological flows

- ❑ Official approach taken by the National Water Agency (ANA):
 - ❑ Traditional approach is based on minimum flows ($Q_{7,10}$)
 - ❑ Gradually (depending on data availability) the assessment is now taking into account the full hydrological series (high and low flows; use of Q_{95} as the reference)
 - ❑ For effluent discharge, qualitative impact is 'transformed' into a quantitative demand (i.e. dilution demand)

The experience so far: an incomplete project or major barriers?

- ❑ Water reforms are part of public sector reforms
- ❑ The official assessment (MMA, 2006)
 - ❑ Environmental problems persist almost unchanged
 - ❑ Structural difficulties to adopt the new framework
 - ❑ Limited number of water user licences
 - ❑ Conflict between federal and state responsibilities
 - ❑ Technological and scientific gaps
- ❑ Some recent assessments mentioned a culture of centralisation; remaining and emerging conflicts; difficulty to deal with local realities

International institutional framework

- ❑ Regional Conference on the Paraná-Prata Basin (1941, Montevideú)
- ❑ Prata Treaty (1969), with an integovernmental coordination committee
- ❑ FONPLATA (1976, based in Sucre, Bol.)
- ❑ Intergovernmental Committee of the Paraná-Paraguai Waterway (1989)

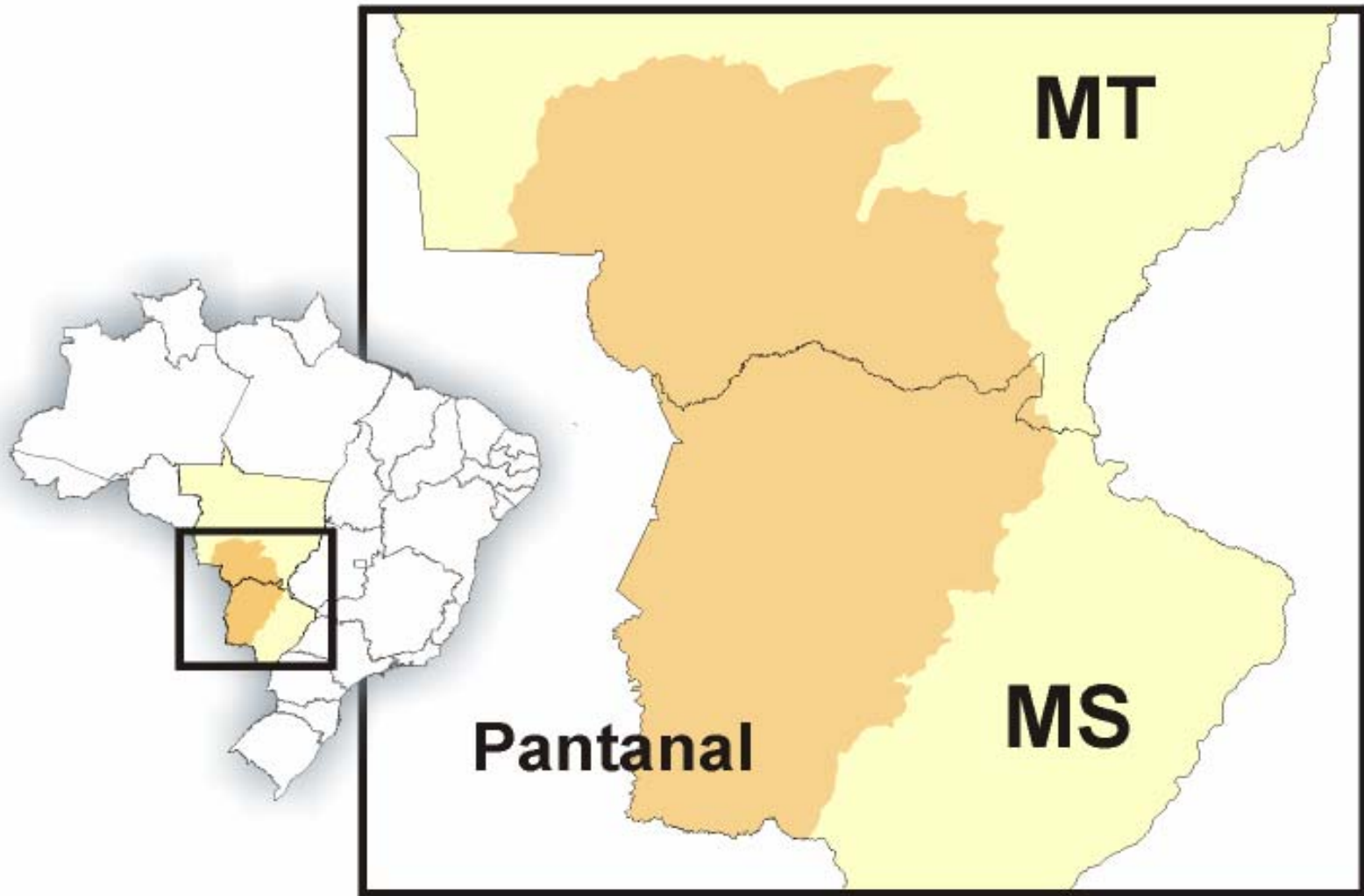
International River Basins of SOUTH AMERICA

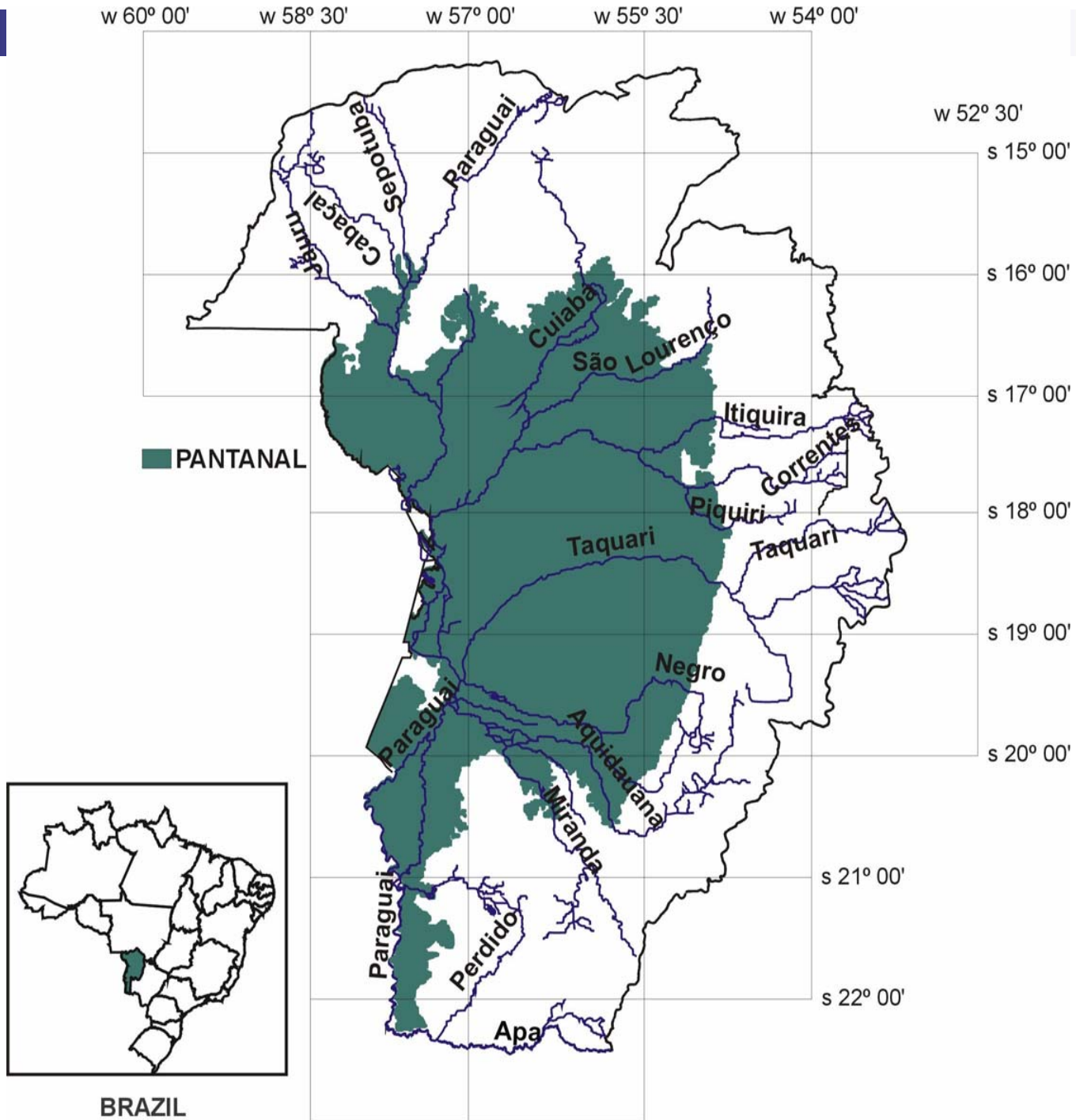


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Key phases of regional development

- ❑ Traditional (extensive, 'well adapted') cattle ranching
- ❑ Centralised (top-down) projects: CIDEPAN (1971), Prodepan (1970s)
- ❑ 'Green Revolution' since 1970s (plateau); intensification of cattle production (floodplains)
- ❑ Fast urbanisation, international integration (e.g. gas from Bolivia)
- ❑ Recent studies: PCBAP (1997); Committee CIBHAPP (1996)

In Brazil, the Pantanal is in two states

❑ Mato Grosso

- ❑ Water law passed in 1997
- ❑ State agency: SEMA ['neoliberal' state administ.]
- ❑ State Water Council established in 2002 & 2005
- ❑ State plan finalised in 2009

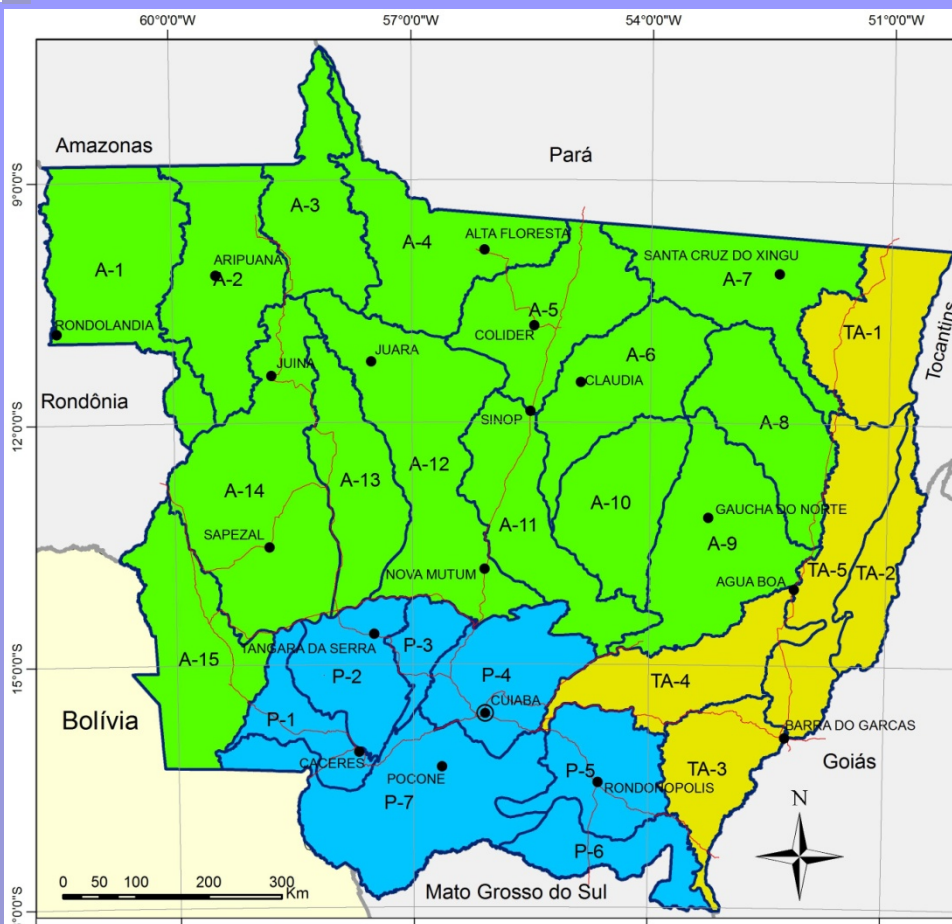
❑ Mato Grosso do Sul

- ❑ Water law passed in 2002 ['left-wing' state adminis.]
- ❑ State agency: SEMAC
- ❑ State Water Council established in 2004 & 2007
- ❑ State plan finalised in 2008



Some results from the
two state plans:

UNITS OF PLANNING AND MANAGEMENT - UPG



REGIÕES HIDROGRÁFICAS NACIONAIS
Estudos de Recursos Hídricos - MT

- Amazônica - 65,7%
- Tocantins-Araguaia - 15,0%
- Paraguai - 19,3
- Principais Rodovias

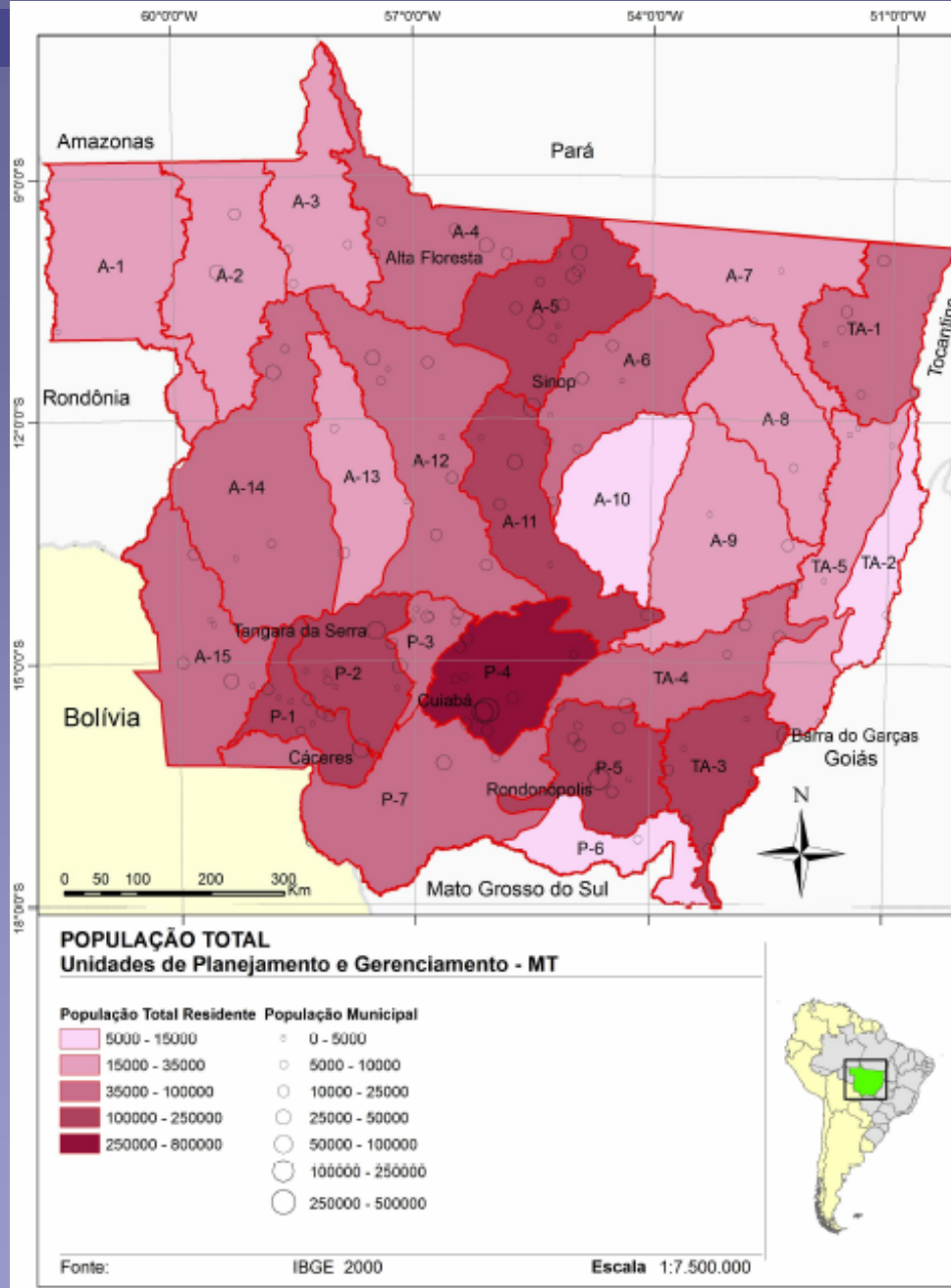


Fonte:

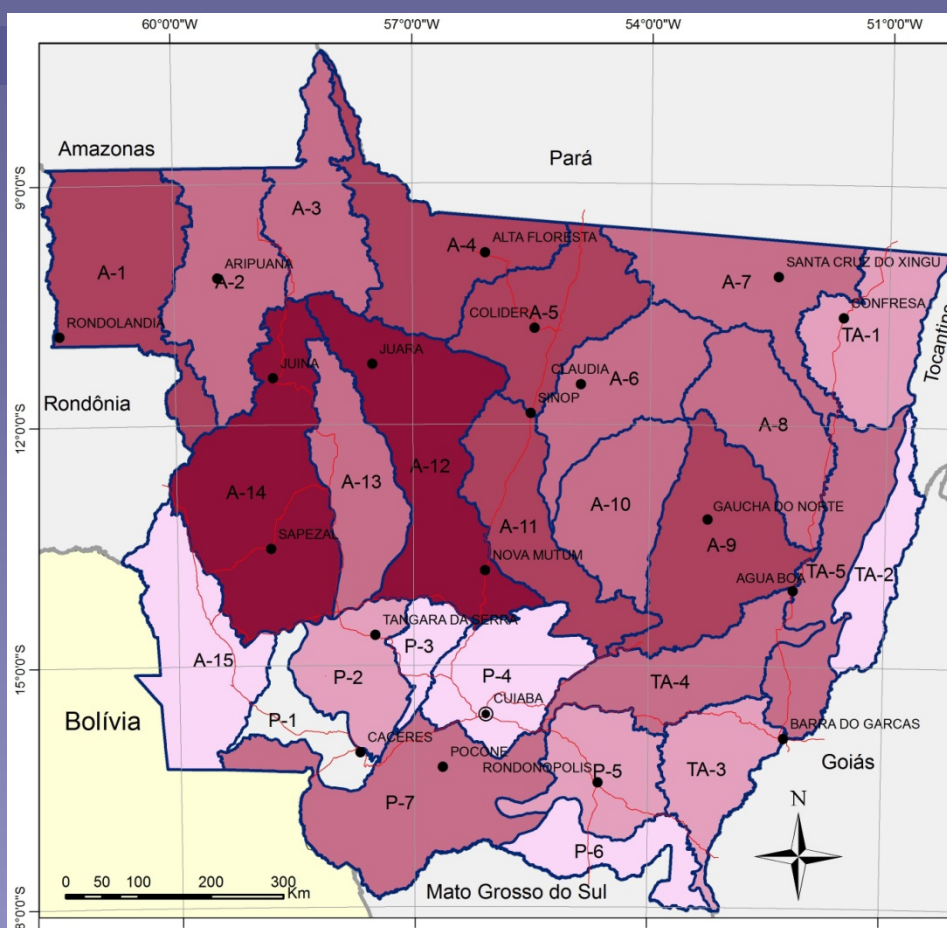
Divisão do Estado de Mato Grosso, segundo – UPG.

Unidade de Planej. Gestão UPG	Área (Km ²)
A1 - Aripuanã	39.653,27
A15 - Guaporé	38.919,20
A2 - Roosevelt	47.388,19
A14 - Alto Juruena	64.113,16
A11 - Alto Teles Pires	34.408,66
A12 - Arinos	58.842,24
A3 - Baixo Juruena	29.492,87
A4 - Baixo Teles Pires	38.991,11
A5 - Médio Teles Pires	35.781,33
A13 - Sangue	28.919,60
A9 - Alto Xingú	44.811,53
A6 - Manissauá-Miçú	33.047,06
A7 - Médio Xingú	37.551,86
A10 - Ronuro	30.272,56
A8 - Suiá-Miçú	31.117,41
PA1 - Jaurú	15.356,62
PA2 - Alto Paraguai Médio	23.404,05
PA3 - Alto Paraguai Superior	9.260,82
PA4 - Alto Rio Cuiabá	29.162,19
PA5 - São Lourenço	24.864,54
PA6 - Correntes - Taquarí	18.104,32
PA7 - Paraguai - Pantanal	53.955,36
TA1 - Baixo Araguaia	31.218,44
TA2 - Médio Araguaia	17.372,48
TA3 - Alto Araguaia	23.330,73
TA4 - Alto Rio das Mortes	29.749,03
TA5 - Baixo Rio das Mortes	33.422,60

Mato Grosso



POPULATION (2000)



ÁGUAS SUPERFICIAIS
Estudos de Recursos Hídricos - MT

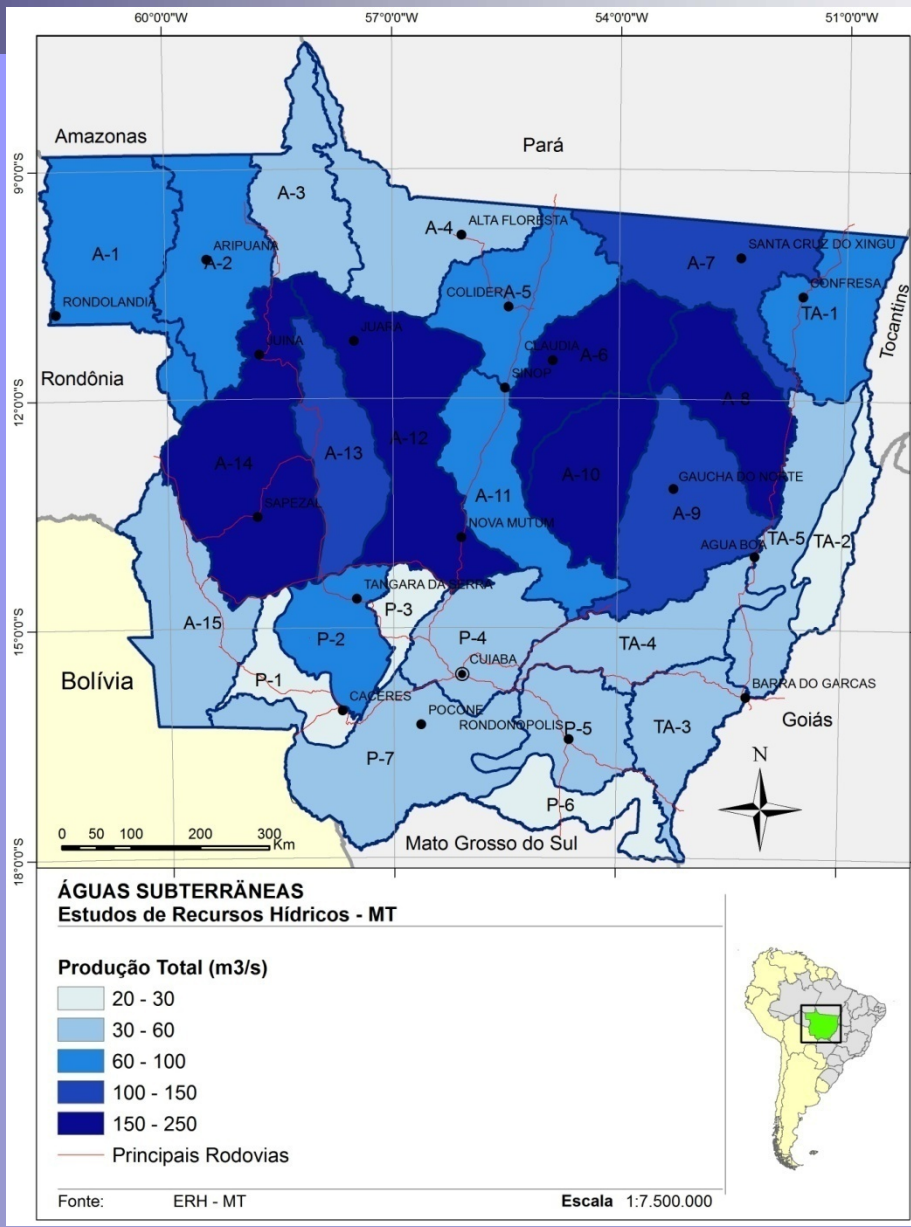
Balanço Hídrico (hm³/ano)

- 3500 - 10000
- 10000 - 15000
- 15000 - 25000
- 25000 - 40000
- 40000 - 60000
- Principais Rodovias

Fonte: ERH - MT

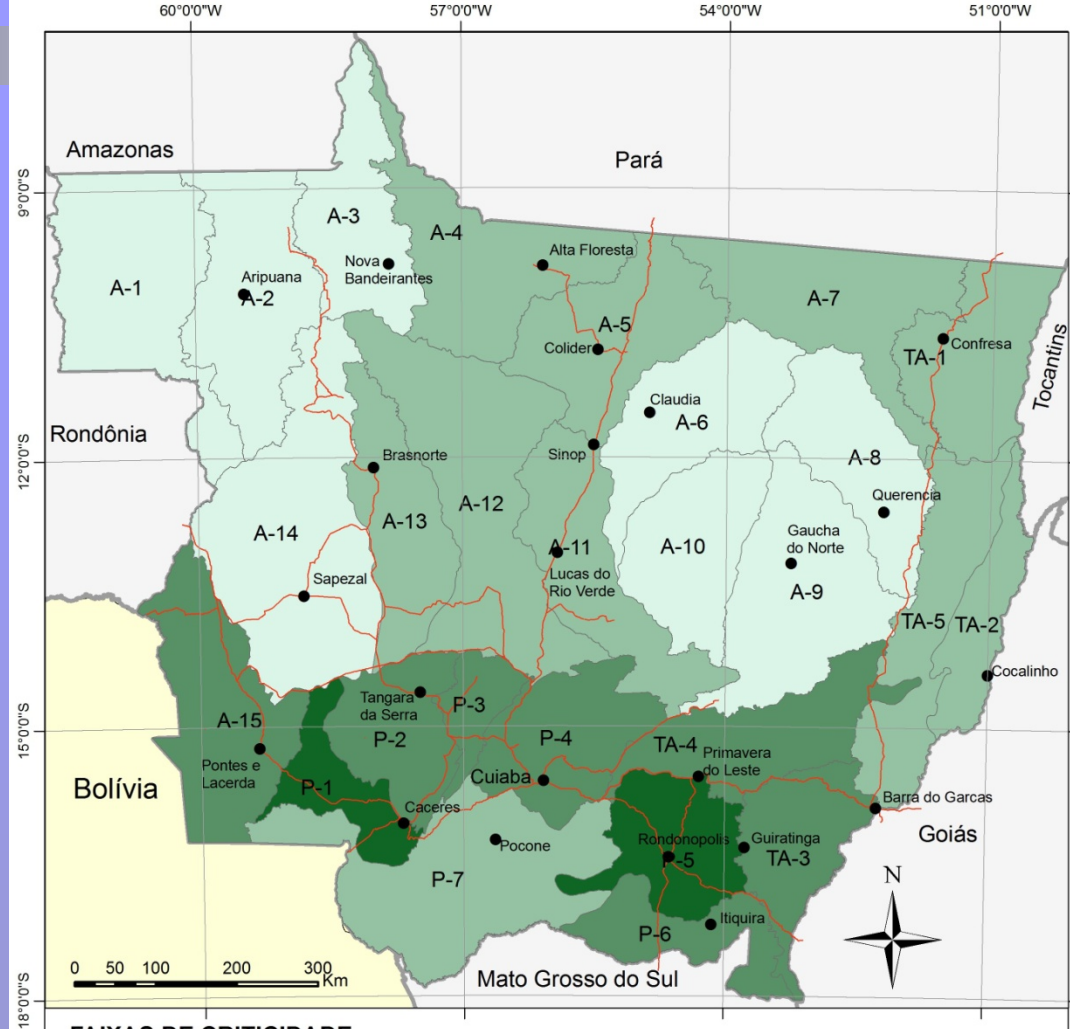
Escala 1:7.500.000





GROUNDWATER

INDEX OF IMPACT



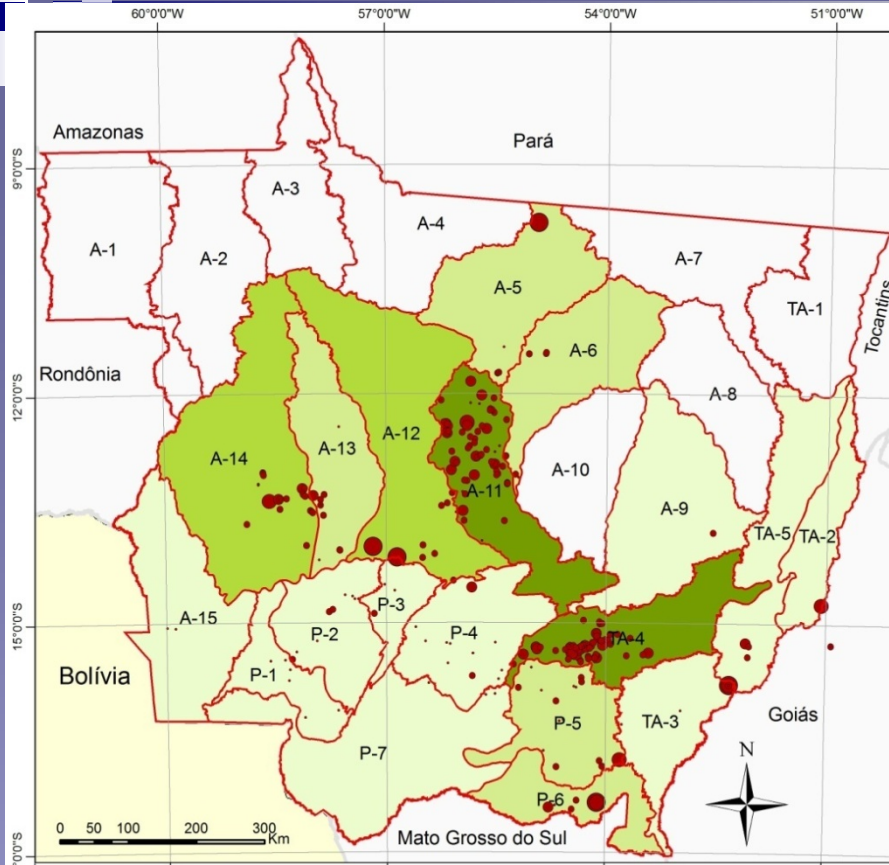
FAIXAS DE CRITICIDADE Estudos de Recursos Hídricos - MT

- De 25 a menos de 40
- De 40 a menos de 55
- De 55 a menos de 70
- Mais de 70
- Principais Rodovias



Fonte: ERH-MT

Escala 1:7.500.000

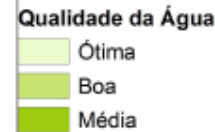


IRRIGAÇÃO
Unidades de Planejamento e Gerenciamento - MT



Fonte: SEMA - MT 2007 Escala 1:7.500.000

AVALIAÇÃO
Unidades de Planejamento e Gerenciamento



Fonte: IBGE SEMA/MT ZSEE-SEPLAN/MT Escala 1:7.500.000

IRRIGATION

SURFACE WATER QUALITY

Mato Grosso do Sul: pollution sources

Quadro 32. Síntese das fontes e cargas poluidoras (t/ano) de Demanda Bioquímica de Oxigênio (DBO), Fósforo (P) e Nitrogênio (N), em cada Unidade de Planejamento e Gerenciamento (UPG) de Mato Grosso do Sul.

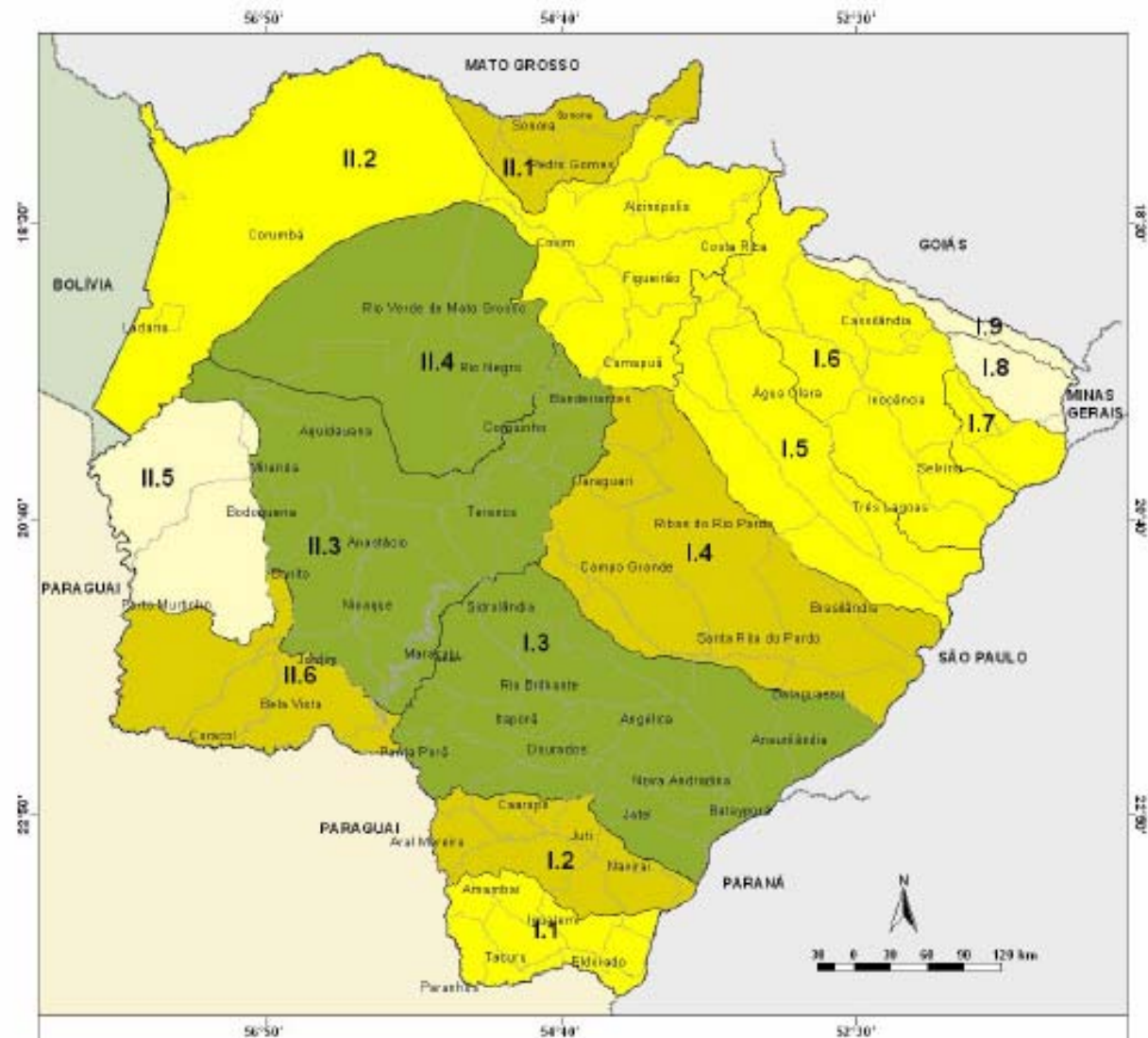
UPG	Esgoto doméstico			Pecuária(1)			Agricultura		Efluente industrial	Agrotóxicos t/ha/a
	DBO	N	P	DBO	N	P	N	P	DBO	
Região Hidrográfica do Paraná										
Iguatemi	1.808	268	33	174.993	53.829	10.763	746	9.287		545
Amambai	1.995	296	37	186.002	60.764	11.452	2.092	21.961		1.321
Ivinhema	10.250	1.518	190	751.278	262.701	46.001	9.875	84.640		5.079
Pardo	15.984	2.368	296	682.834	212.104	41.409	1.241	8.570		591
Verde	597	88	11	400.492	120.149	24.242	222	2.573		168
Sucuriú	2.597	385	48	445.994	134.198	27.067	1.973	18.299		1.055
Quitéria	432	64	8	97.975	31.453	5.966	323	92		50
Santana	747	111	14	86.546	26.774	5.256	64	55		10
Aporé	423	63	8	51.616	15.678	3.137	63	519		30
Total da Região	34.833	5.161	645	2.877.731	917.650	175.293	16.599	145.996		8.850
Região Hidrográfica do Paraguai										
Correntes	406	60	7	103.949	31.306	6.304	525	5.640	1,97	381
Taquari	3.975	589	74	647.063	194.548	39.265	1.245	14.344	0,66	825
Miranda	4.039	598	75	717.529	231.469	43.788	1.665	13.612	12,05	819
Negro	354	52	6	341.344	102.722	20.740	45	1.145	0,02	66
Nabileque	93	14	2	133.363	40.027	8.104	15	36		2
Apa	931	138	17	232.590	69.912	14.283	305	2.671		154
Total da Região	9.799	1.451	181	2.175.838	669.984	132.484	3.800	37.448		2.247
Total do Estado	44.632	6.612	826	5.053.569	1.587.634	307.777	20.399	183.445		11.097

(1) Bovinos, suínos, ovinos e caprinos, aves (galos, galinhas, frangos e pintos)

Contribuição relativa à UPG

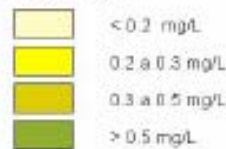
Fonte: IBGE (2005), SNIS (2005), Sanesul (2007), Águas Guariroba (2007).

Phosphorus



Plano Estadual de Recursos Hídricos de Mato Grosso do Sul
Concentração de Fósforo em relação a vazão média de longo termo (QMLT)

LEGENDA



Unidades de Planejamento e Gerenciamento

UPGs Paraguai	UPGs Paraná
1.1 - UPG Iguaçu	1.1 - UPG Correntes
1.2 - UPG Amambai	1.2 - UPG Taquari
1.3 - UPG Ivinhema	1.3 - UPG Miranda
1.4 - UPG Pardo	1.4 - UPG Negro
1.5 - UPG Verde	1.5 - UPG Nabileque
1.6 - UPG Sucuriú	1.6 - UPG Apa
1.7 - UPG Quiteria	
1.8 - UPG...	

Apart from the plans and the organisation of regulatory agencies...

(Plans are prepared by consultants and funded by the central government or international banks...)

- ❑ The introduction of regulatory instruments is much more difficult, for example:
 - ❑ Water licences (in the large rivers) are normally responsibility of the central government
 - ❑ Strong resistance against water charges
 - ❑ Development pressures (hydropower, grain production, industries, etc.) subverting the rationale of the regulation

Formal recognition of problems

- ❑ From recent official publications:
 - ❑ Lack of resources
 - ❑ Problems with information and database
 - ❑ Lack of technical capacity (e.g. laboratories)
 - ❑ Limited monitoring network
- ❑ In addition, issues related to stakeholder representation and participation

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Some general conclusions about the 'governance transition' (1)

- ❑ The implementation of the new legislation has been discontinuous, non-linear and is taking longer than initially planned
- ❑ Initial enthusiasm has been followed by a uncomfortable 'reality check' and concerns about growing pressures/impacts
- ❑ Focus has been on technical deficiencies, but less so on participation and negotiation (however, the new regulatory process has produced interesting opportunities for collective learning)

Some general conclusions about the 'governance transition' (2)

- ❑ Most research projects have relied on federal and on international support (ANA, GEF, IADB, etc.)
- ❑ Ultimately, water management problems are part of broader disputes & political controversies (e.g. waterway, hydropower, agriculture, etc.)
- ❑ The balance of power is inscribed in the social/spatial relations around water and catchment management