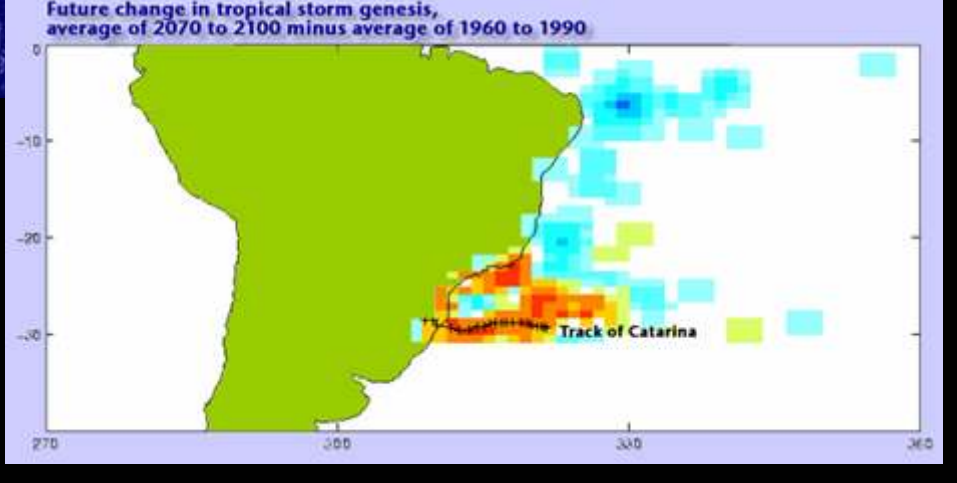
13ª semana de tecnologia metroferroviária



Marcelo Furtado

Estudo de caso

Paciente: Terra

Idade: + 6 bilhões de anos

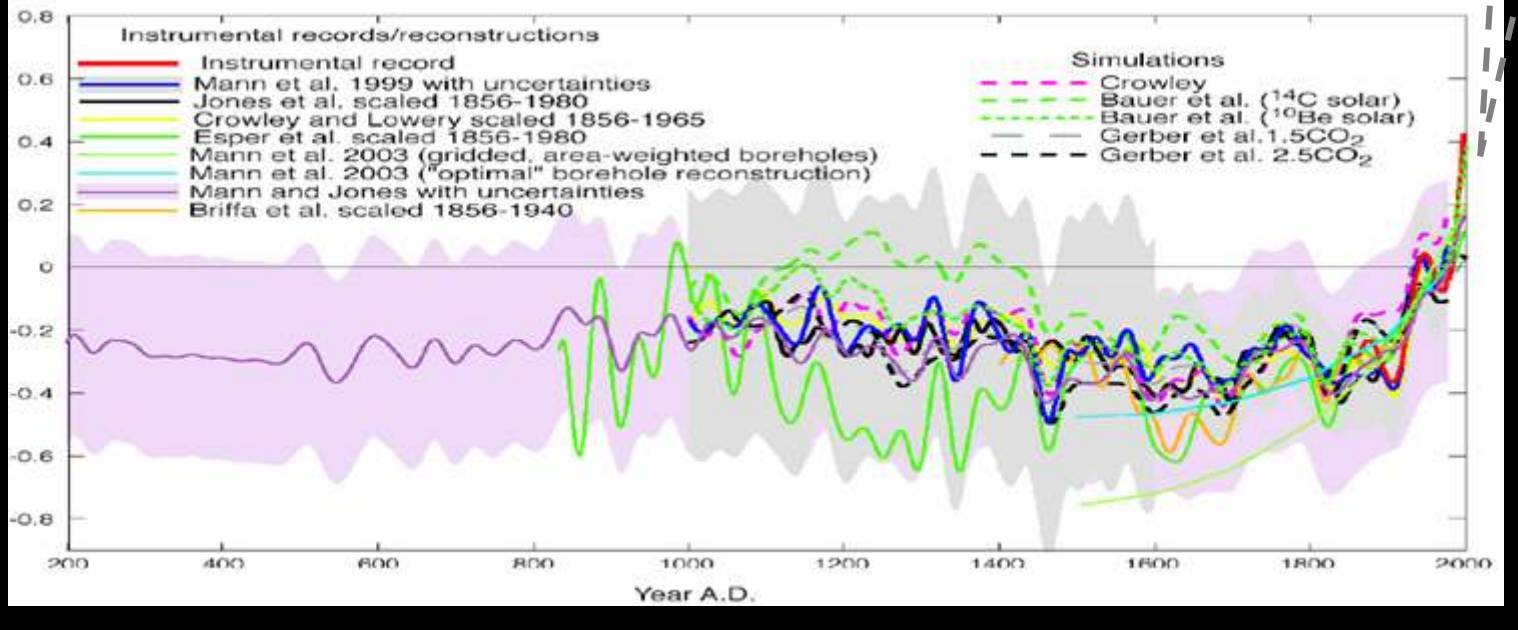
Peso: obesa

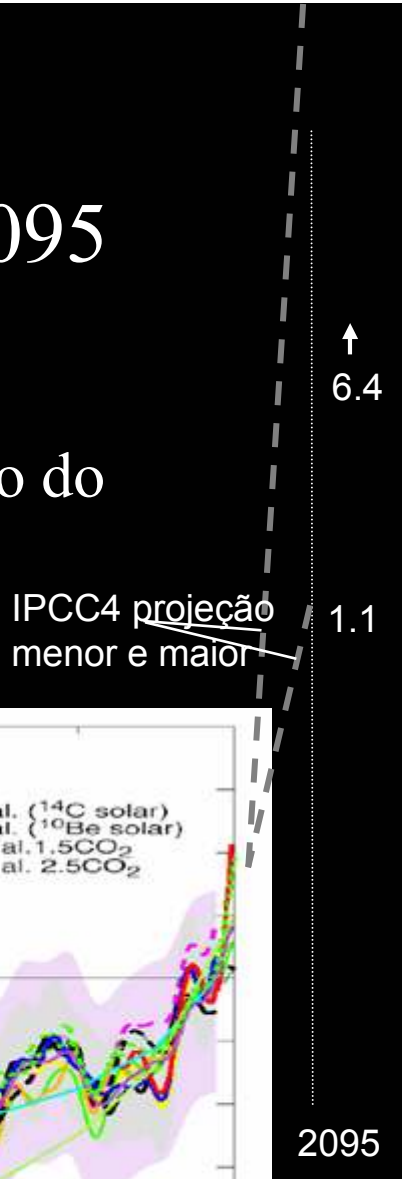
Sintomas: febre, poluição, contaminação generalizada

Tempo de recuperação: 10 a 15 anos

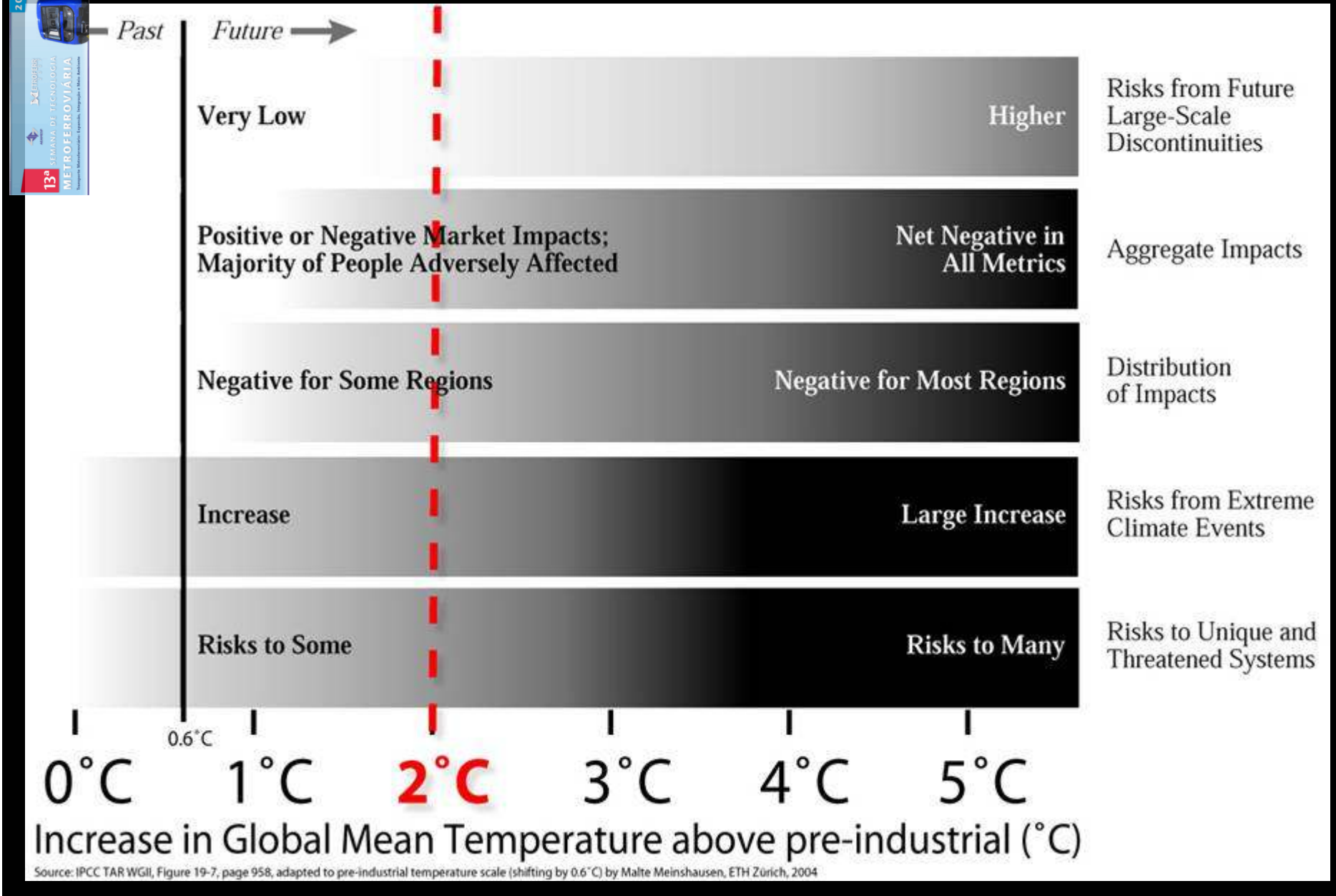
Projeção do aquecimento no para 2095
(nível 1980-1999)

mais secas, ondas de calor, inundações, aumento do nível do mar e furacões mais fortes.

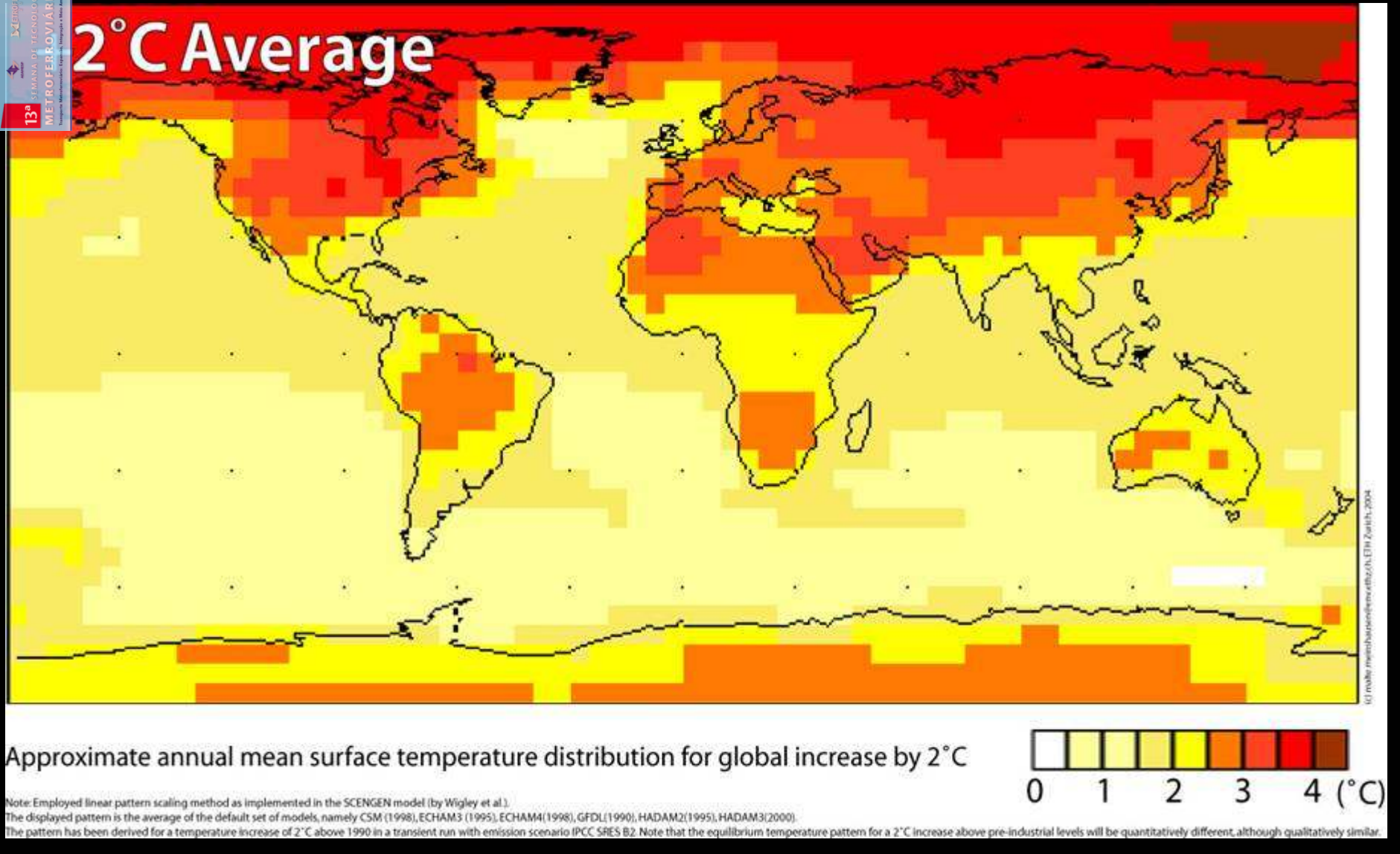




Razões para preocupação



Cenário mais otimista de aumento de 2oC



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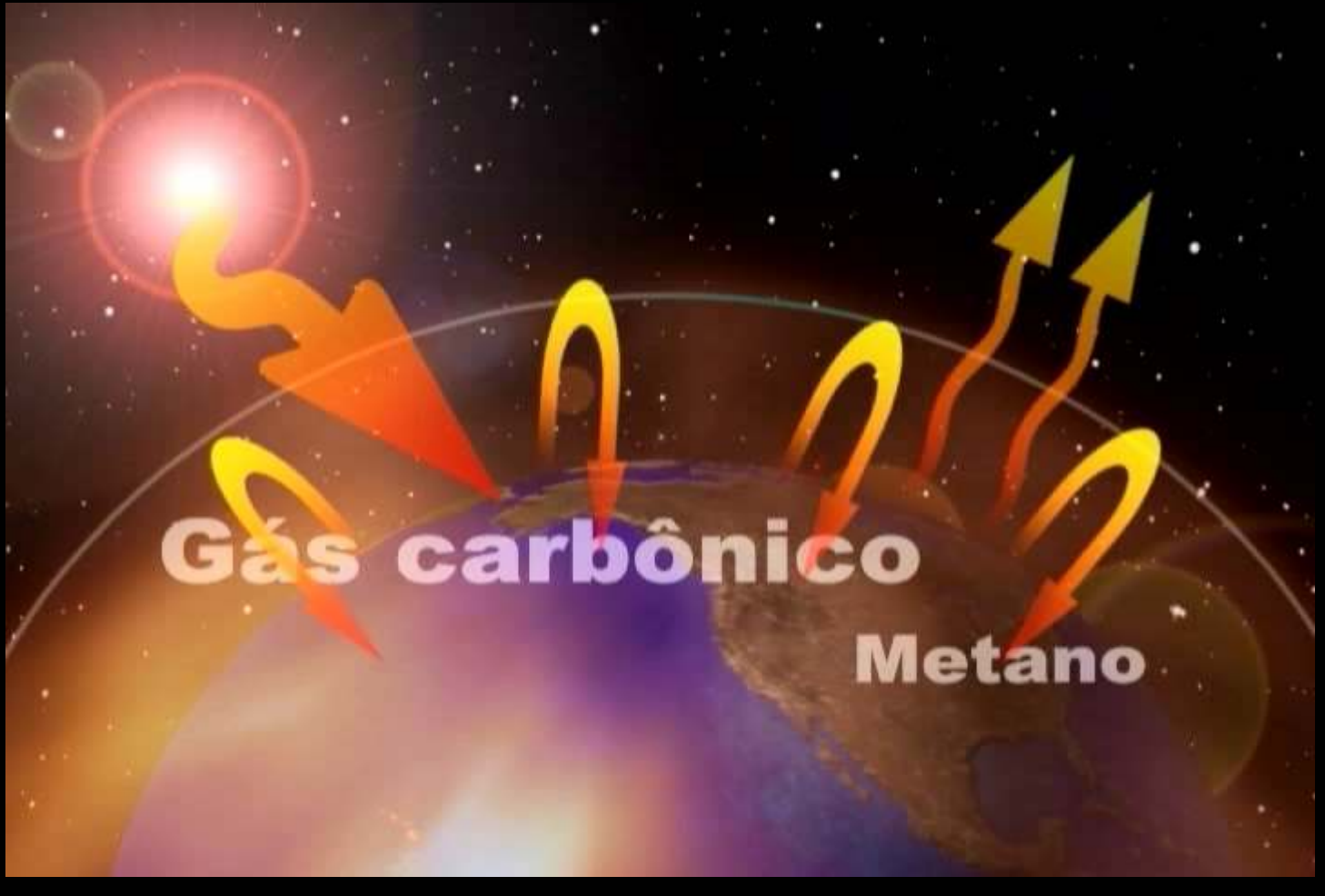
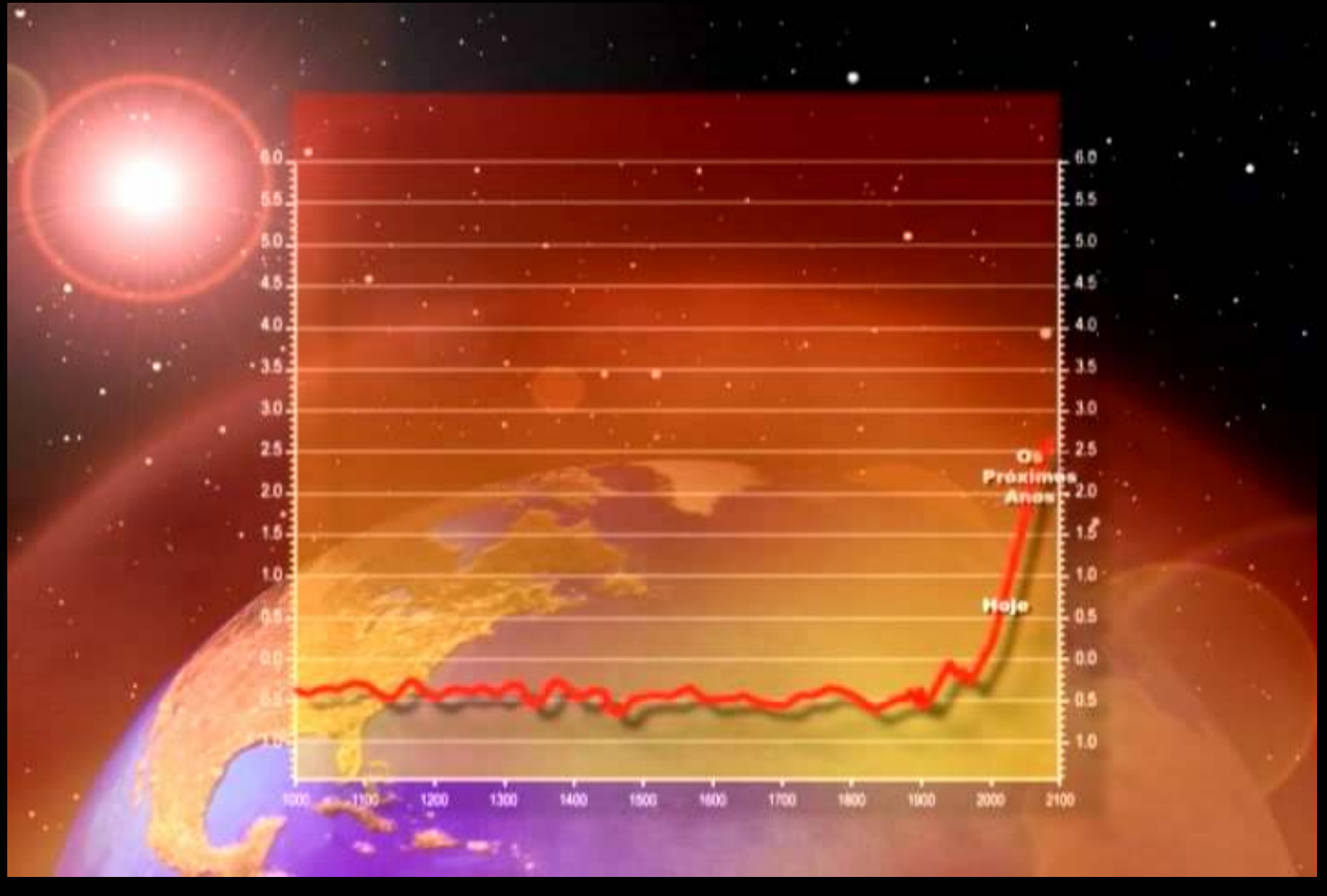
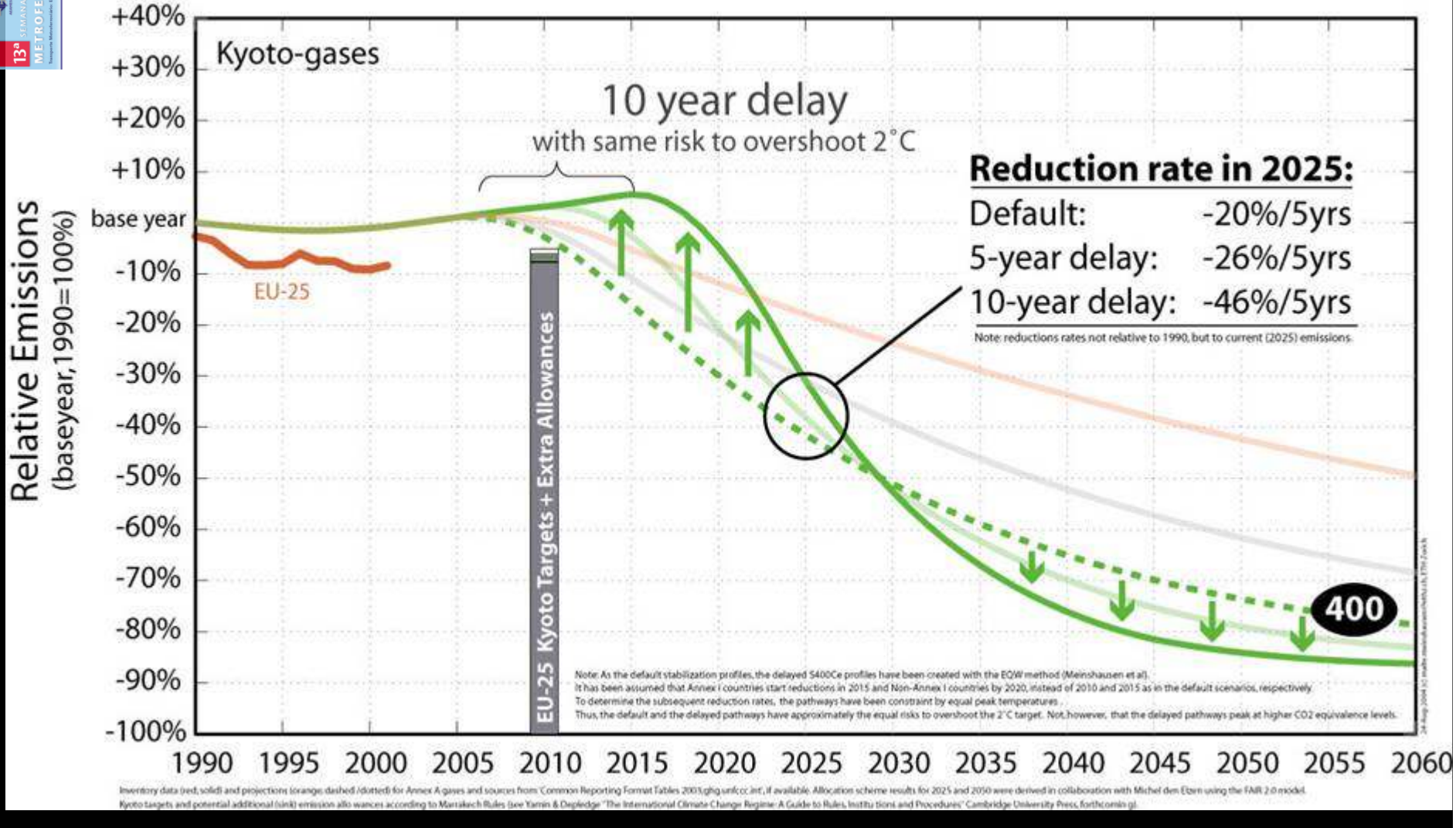

Gás carbônico
Metano


6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.5
1.0
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
Os Próximos Anos
Hoje

“Postergar nossas ações por um década ou simplesmente por alguns anos, não é uma opção séria” Sir David King (Science, Janeiro 04)



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mudanças climáticas
um desafio global

1 AUGUST 1992
Damage caused by Hurricane Andrew, Dade County, Miami, Florida. USA.

1 AUGUST 1992
Damage caused by Hurricane Andrew, Dade County, Miami, Florida. USA.

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23 FEBRUARY 1993
Holiday chalet in danger of collapse as high tides and wave pressure erode the sand, Hemsby, Norfolk. East coast England.

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espécies em movimento

1 JULY 1998
Caribou migrating to winter grounds from coastal plain. Alaska, USA.
Effected by Climate Change.
©Greenpeace/Morgan

1 JULY 1998
Caribou migrating to winter grounds from coastal plain, Alaska, USA
©Greenpeace/Morgan

1 AUGUST 1998
The bodies and carcasses of Peary caribou that have died in the last few years due to adverse wheather conditions affecting winter foraging have mostly been eaten by wolves and ravens.

espécies invadindo

1 JULY 1997
Spruce beetles growing in large numbers due to climate change.
(c)Greenpeace/Beltra

1 JULY 1997
Forest destroyed by Spruce beetles growing in large numbers due to climate change.
(c)Greenpeace/Beltra

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vidas inundadas

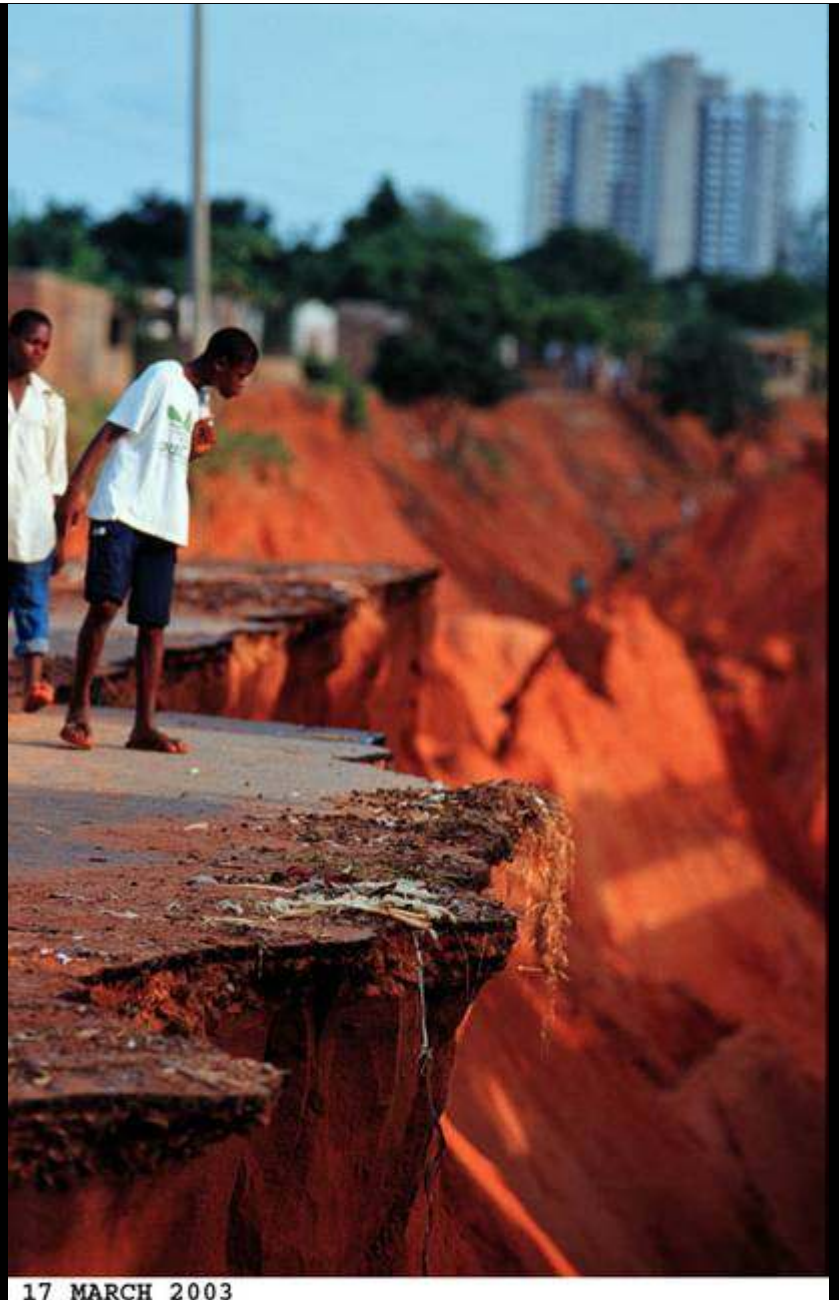
17 MARCH 2000
Receding water reveals devastation to evacuated town Xai Xai, Limpopo River Basin, Mozambique.

AEAMESP

12 AUGUST 2002
Floods in Passau in Germany after days of rainfall. Here a woman is trying to prevent water from flooding her house.
(c)Lehsten/Greenpeace

5 December 2003
Floods around Caderousse.
©2003 Greenpeace/Matthieu Barret

1 DECEMBER 1997
UN tries to reach flooded villages, Juba basin, Somalia. Climate change effects.



17 MARCH 2003
Torrential rains slice a massive gorge into the capital city.The road and 100 homes were lost, Mozambique Accession.
©Greenpeace/Shirley

1 DECEMBER 1997
Food distribution only possible by boats in flooded Somalia,
Climate change effects.
©Greenpeace/Shirley

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incêndios

1 AUGUST 1996
Sky filled with huge clouds of smoke over houses due to forest fires in Mackenzie Bay, Canada.

1 APRIL 1998
Greenpeace bearing witness to forest fires in east Kalimantan, Indonesia. Athena Ronquillo, Regional Campaigns Director for GP S/E Asia.

6 AUG 2003
Fireman walking down burnt hillside, wisps of smoke rising from ground. Portugal has declared a national disaster after the worst forest fires in more than two decades.
(c)Greenpeace/Armestre

7 august 2003 Vale Alto, Santarem, Portugal -
Flames consume huge areas of forest in Vale Alto, Santarem, Portugal. Portugal has declared a national disaster after the worst forest fires in more than two decades.
(c)Greenpeace/Armestre

1 OCTOBER 1997
Rainforest on fire due to climate change effects from "El Nino". Jambi Province, Sumatra, Indonesia. Children sitting on a wooden raft on a lake/river surrounded by smoke.

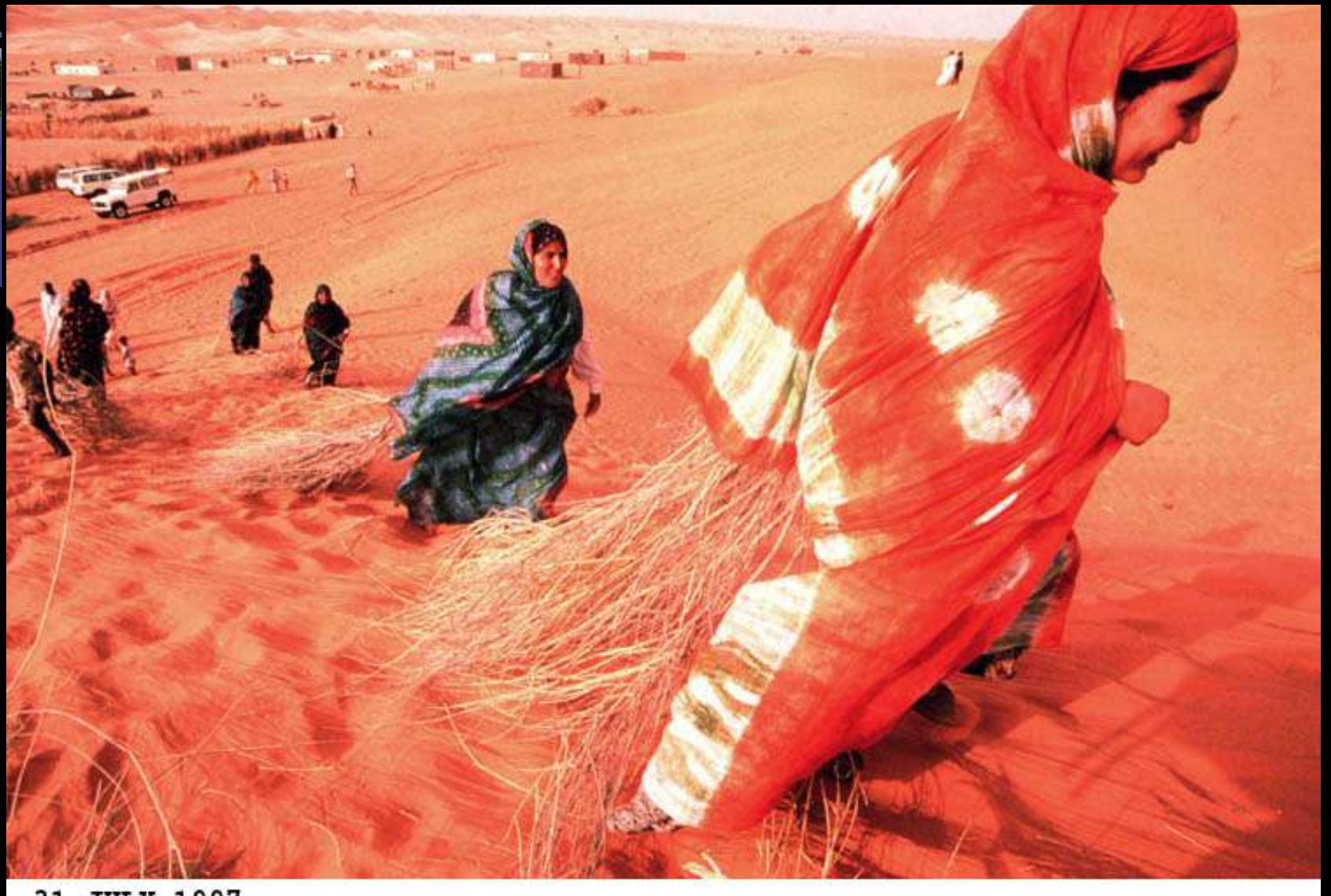
1 OCTOBER 1997
Rainforest on fire due to climate change effects from "El Nino".
Jambi Province, Sumatra, Indonesia
©L./Greenpeace

6 AUGUST 2003
Flames consume huge areas of forest in Montalvao, Portugal. Portugal has declared a national disaster after the worst forest fires in more than two decades.

desertos

15 JUNE 1997

Local people building fences to stop erosion in Zarat, Tunisia



31 JULY 1997
Ljnanoune, villagers secure sand dunes
©Greenpeace/Shirley

April 1998
Sandstorm originate from the desert can reach as far as Japan. Each year, volunteers from Japan come to plant trees in Western China.
©1998- Lu Tongjing/Greenpeace

April 1999
Scenes of dead baby camels are not uncommon at Alanshan, Inner Mongolia . Mother camels do not have enough milk for the baby camels because desertification has eroded much of the grassland.

April 1998
Camel owner Baoyin Culu says prayers at the place where his last camel died. All of his 80 camels died from lack of grazing ground due to dissapearing grasslands and desertification in the region.

May 1995
A villager in the suburbs of Baotou collects dry wood from young trees. With drought as groundwater level declines each year many trees die from lack of water.
©1995- Lu Tongjing/Greenpeace

April 2002
Boy drinking unclean water.
Scarcity of water has lead to unclean water being sold to local people. With the increasing drought and the rise in desertification in the area fresh drinking water has become a precious commodity.

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morte dos corais

1 APRIL 1998
Greenpeace and Southern Cross University divers working on bleached coral, Great Barrier Reef, Australia.
©Greenpeace/grace

1 APRIL 1998
Dr Peter Harrison, Southern Cross University with bleached coral, Great Barrier Reef, Australia.

e o mar vai subir

1990
Tarawa, one of the many atolls making up the Kiribati group in the Pacific. Feared sea level rises from the Greenhouse Effect threaten most islands in the group.

1 JANUARY 1999
Majuro Attoll, Marshall islands, affected by sea level rise due to climate change.

1 JANUARY 1999
Majuro Attoll, Marshall islands, affected by sea level rise due to climate change.

derretimento

29 JULY 1997
Cemetery collapsing due to permafrost melting. Alaska, USA
(c)Greenpeace/Beltra

1 FEBRUARY 1997
Icebergs melting in low sun. Arctic Sunrise in background
©Greenpeace/Morgan

3 AUGUST 2002
Greenpeace documentation showing that glacier "Blomstrandbreen" has retreated nearly 2 km since 1928, with an accelerated rate of 35 metres lost per year since 1960.
(c)Greenpeace/Aslund

1 FEBRUARY 1997
Crack in Larsen A iceshelf
(c)Greenpeace/Morgan

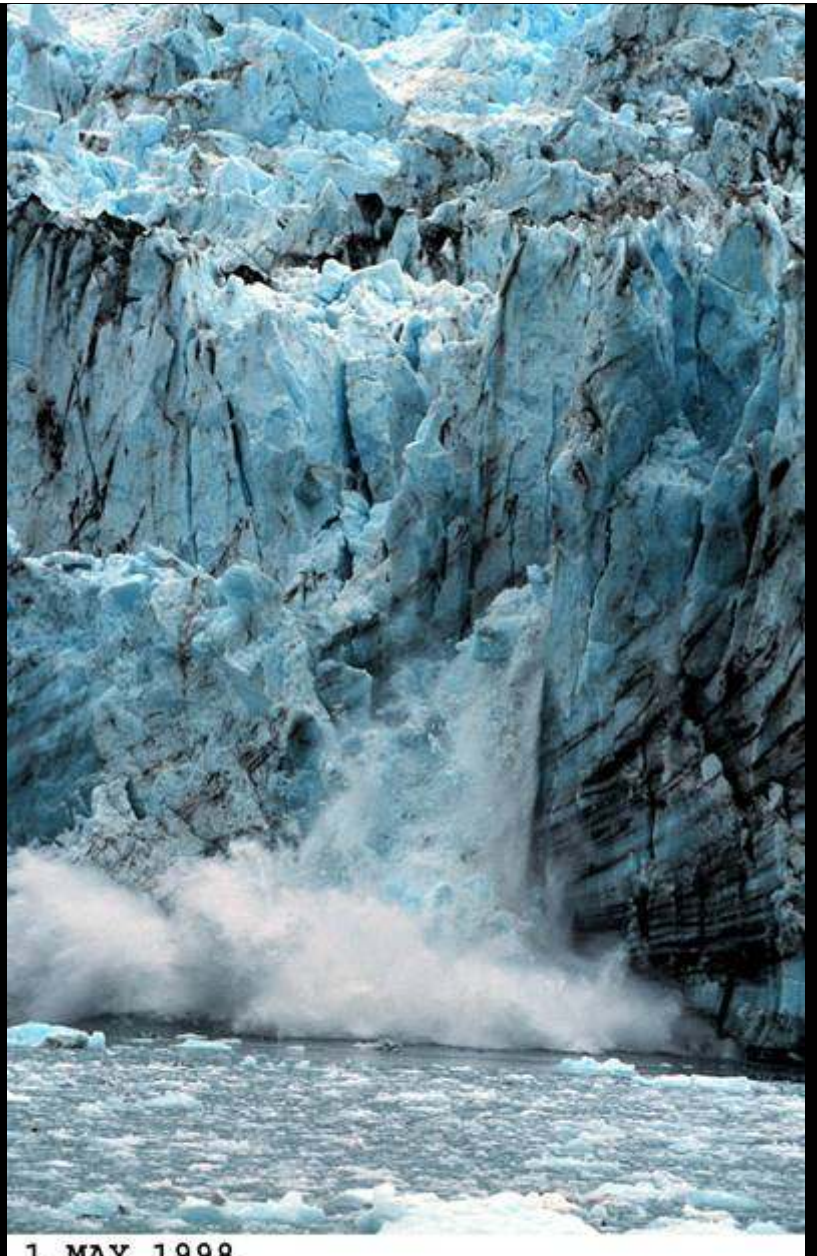
1 FEBRUARY 1997
Wide aerial view of two Greenpeace people near canyon sized crack in the ice, crack runs from bottom right corner to top left corner of frame.

1999

Polar bear on iceflow, Chuckchi Sea.

(c)Greenpeace/Beltra

13 JULY 1999
Greenpeace tour investigating Climate change effects in Arctic. Walrus on iceflow.Chuckchi sea.

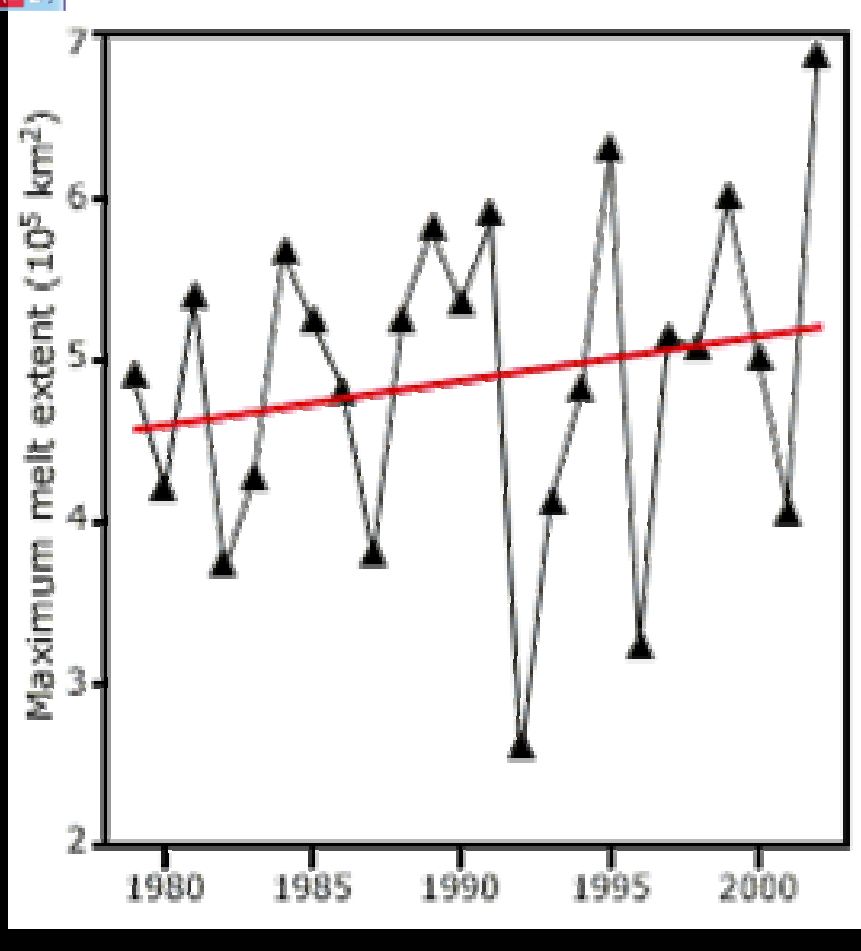


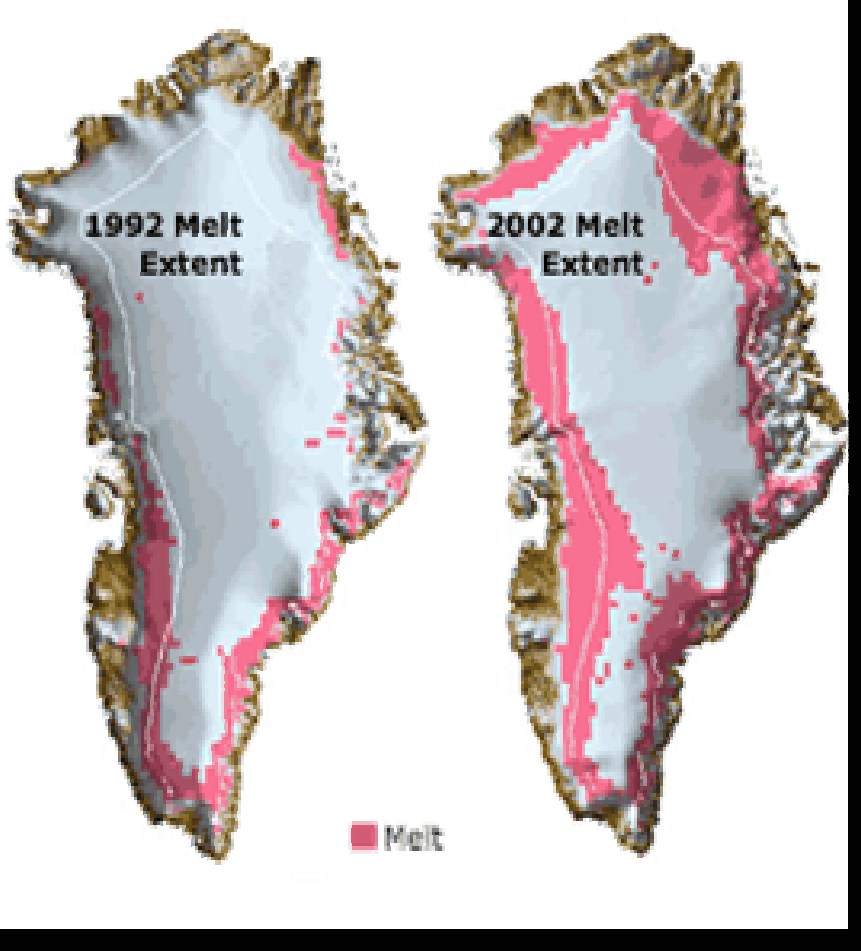
1 MAY 1998
Bryn Mawr Glacier collapsing due to climate change, Prince William Sound, Alaska, USA
©Greenpeace/Morgan

JANURAY 2004 - MV Arctic Sunrise in Puerto Chacabuco bay, Chile. Greenpeace has been touring Patagonia and Chile for 4 weeks, investigating the extent to which the glaciers and ice-fields there are disappearing.

Derretimento das geleiras e as mudanças climáticas

Antártica e Groelândia contribuíram com 15% do aumento do nível do mar no período 1993-2003



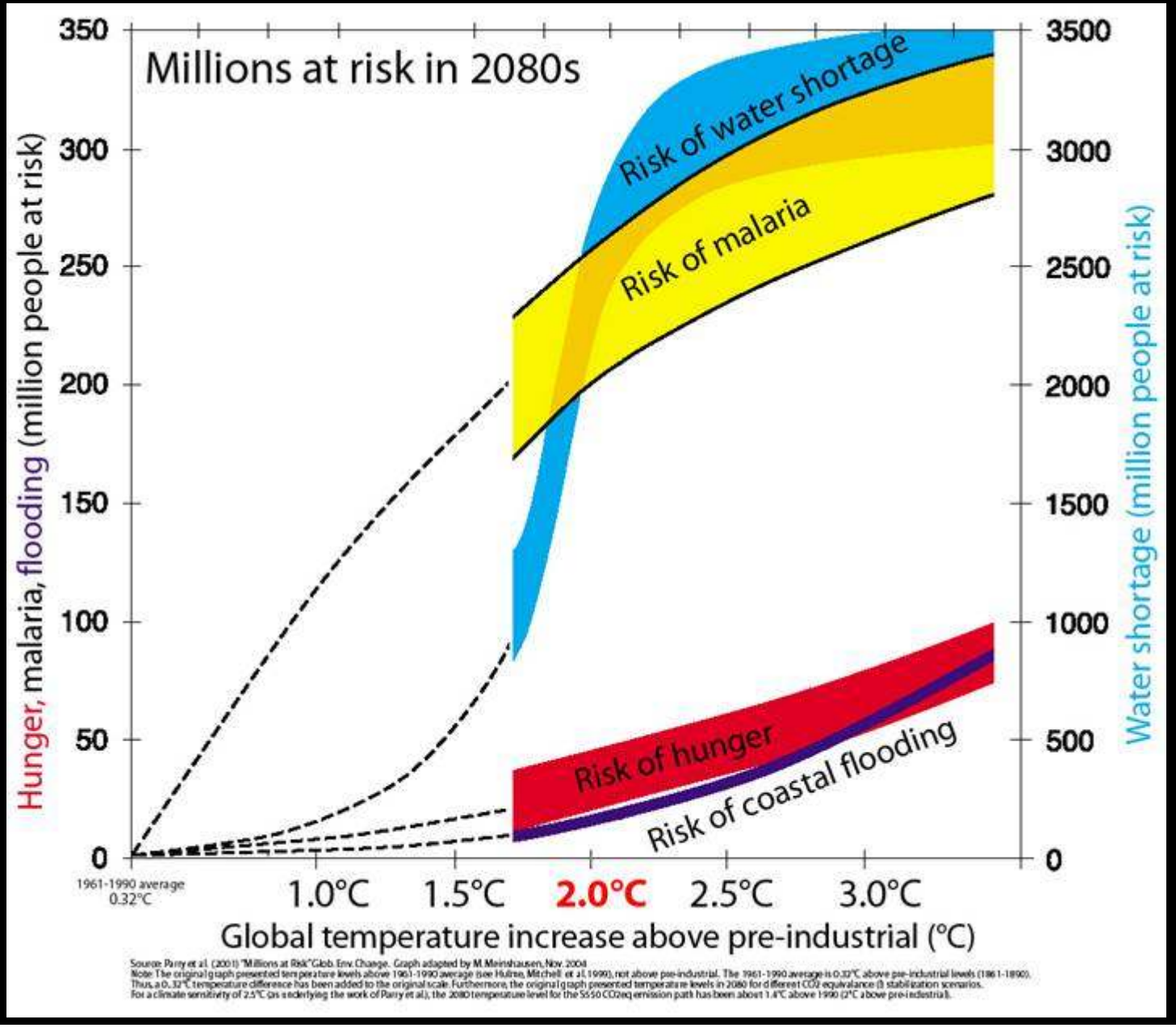


1 AUGUST 2002
Swedish Greenpeace activist Erika Augustinsson, comparing a photo of Biomstrandbreen (1928) with the present situation.
(c)Greenpeace/Aslund

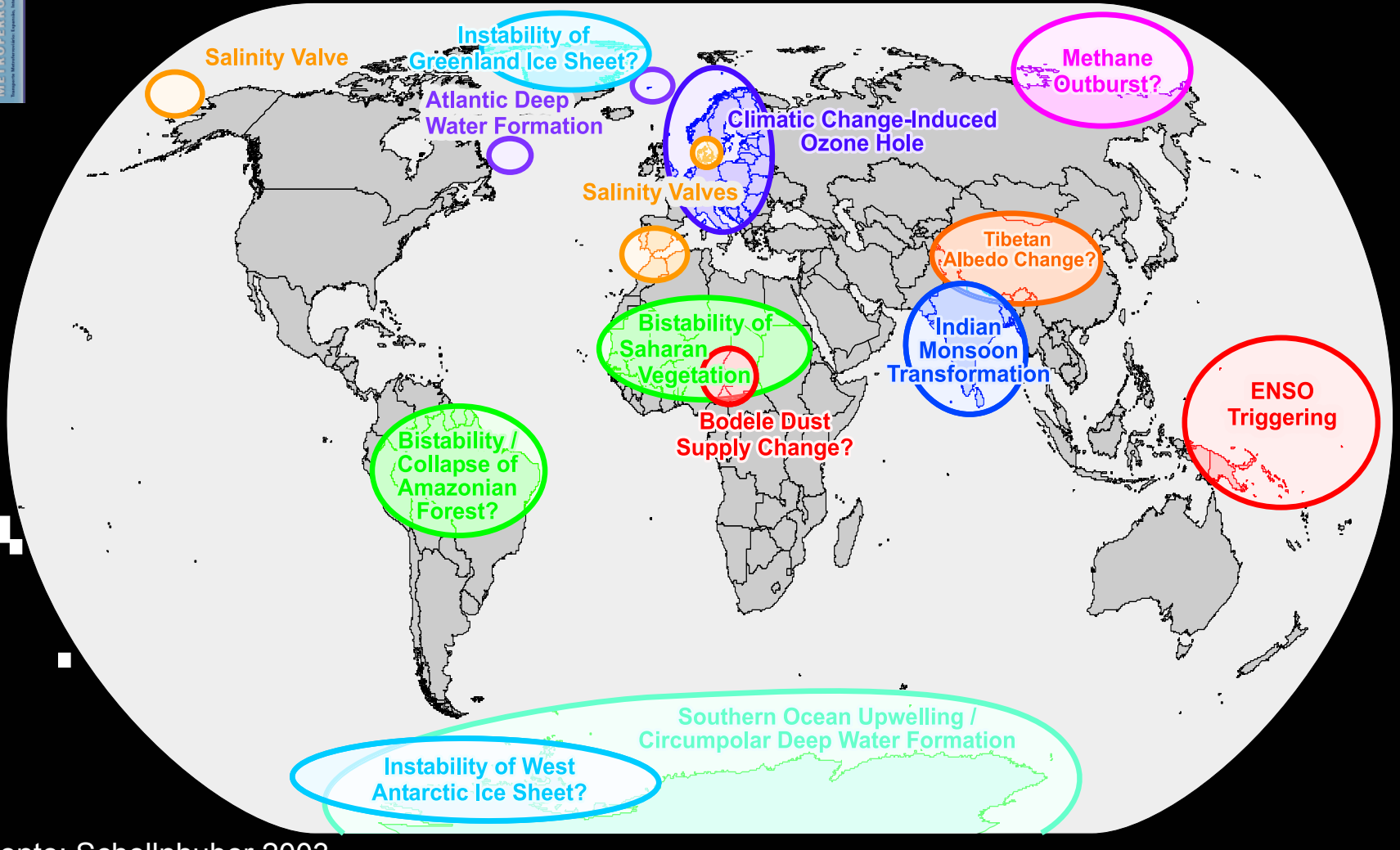
(top photo)1928 -UPSALA GLACIER, PATAGONIA, ARGENTINA
Historic Image Original photograph taken in 1928 of the Upsala Glacier.

(bottom picture) c1801041 -UPSALA GLACIER, PATAGONIA, ARGENTINA
Composite image of Upsala Glacier. Patagonia, Argentina.

Milhões em risco (Parr et al 2001)



Áreas críticas para os impactos climáticos

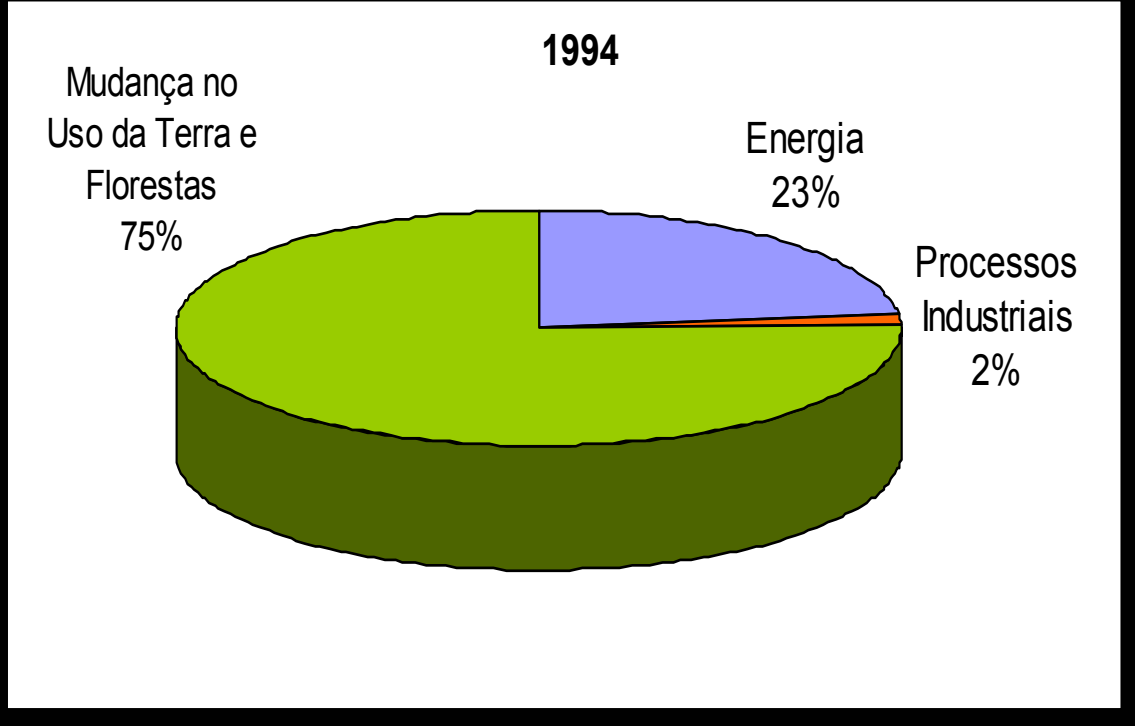


Fonte: Schellnhuber 2003

IMPACTOS DAS MUDANÇAS CLIMÁTICAS NO BRASIL

4. Brasil

BRASIL 4o MAIOR EMISSOR



Total 1994

1030 milhões t CO2

Ministério da Ciência e Tecnologia

BRASIL UM PAÍS DE TODOS GOVERNO FEDERAL

EMISSÕES FLORESTAIS E A MATRIZ ENERGÉTICA SERÃO CHAVES PARA O BRASIL

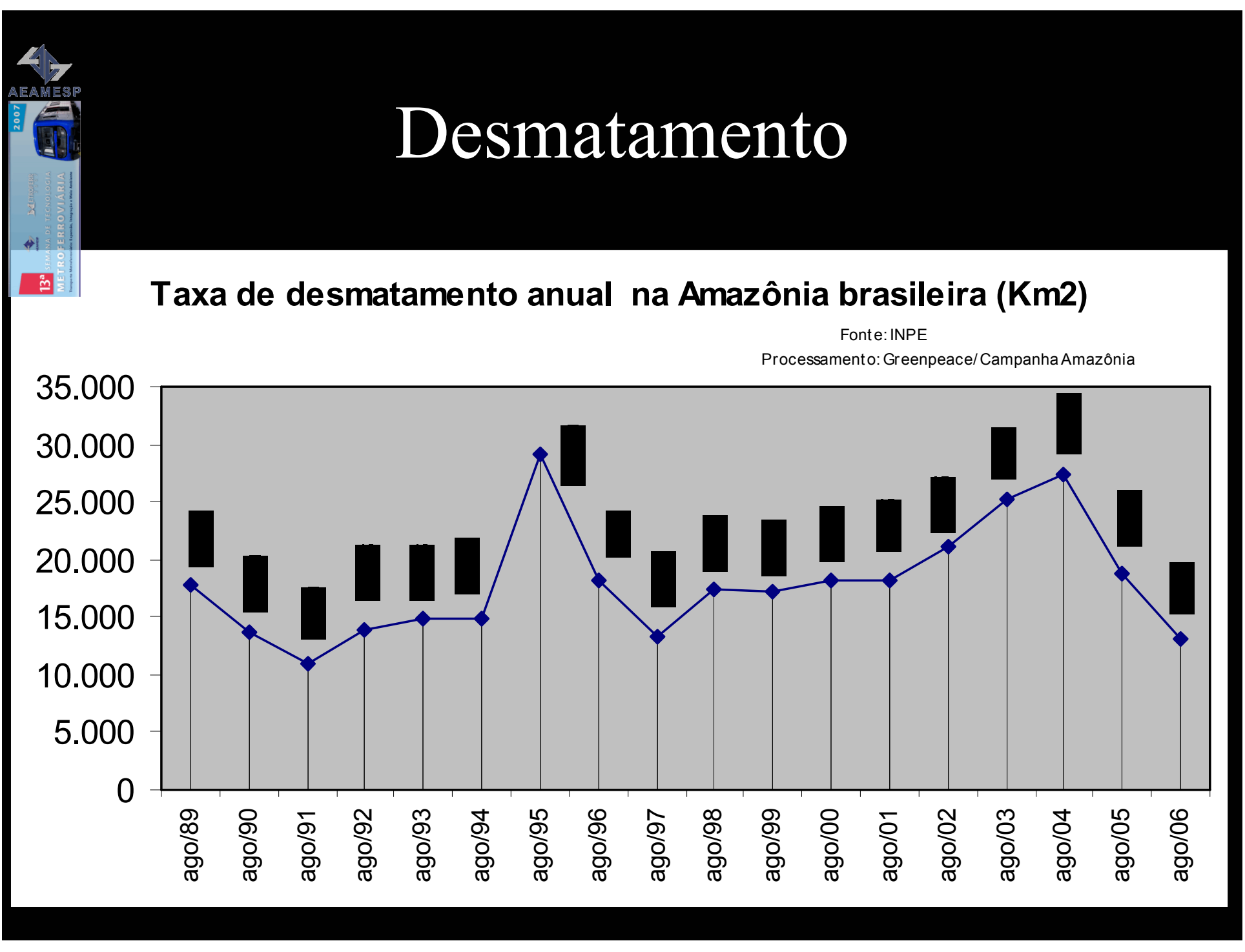

CSR
CENTRO DE SENSORIAMENTO REMOTO - UFMG
IFAM - INSTITUTO DE PESQUISA AMBIENTAL DA AMAZÔNIA
WOODS HOLE RESEARCH CENTER
2001
AEAMESP
2007
13ª SEMANA DE TECNOLOGIA METROFERROVIÁRIA
Ciudad Bolivar
San Cristobal
Georgetown
Medellin
Puerto Ayacucho
Paramaribo
Cayenne
Bogotá
Cali
Florencia
Puerto Inirida
Boa Vista
Macapá
Belém
Manaus
Santarém
São Luís
Iquitos
Teresina
Porto Velho
Rio Branco
Palmas
Cuzco
Cuiabá
Brasília
La Paz
Santa Cruz de La Sierra
Goiania

AEAMESP

2007

13ª SEMANA DE TECNOLOGIA METROFERROVIÁRIA

Desmatamento

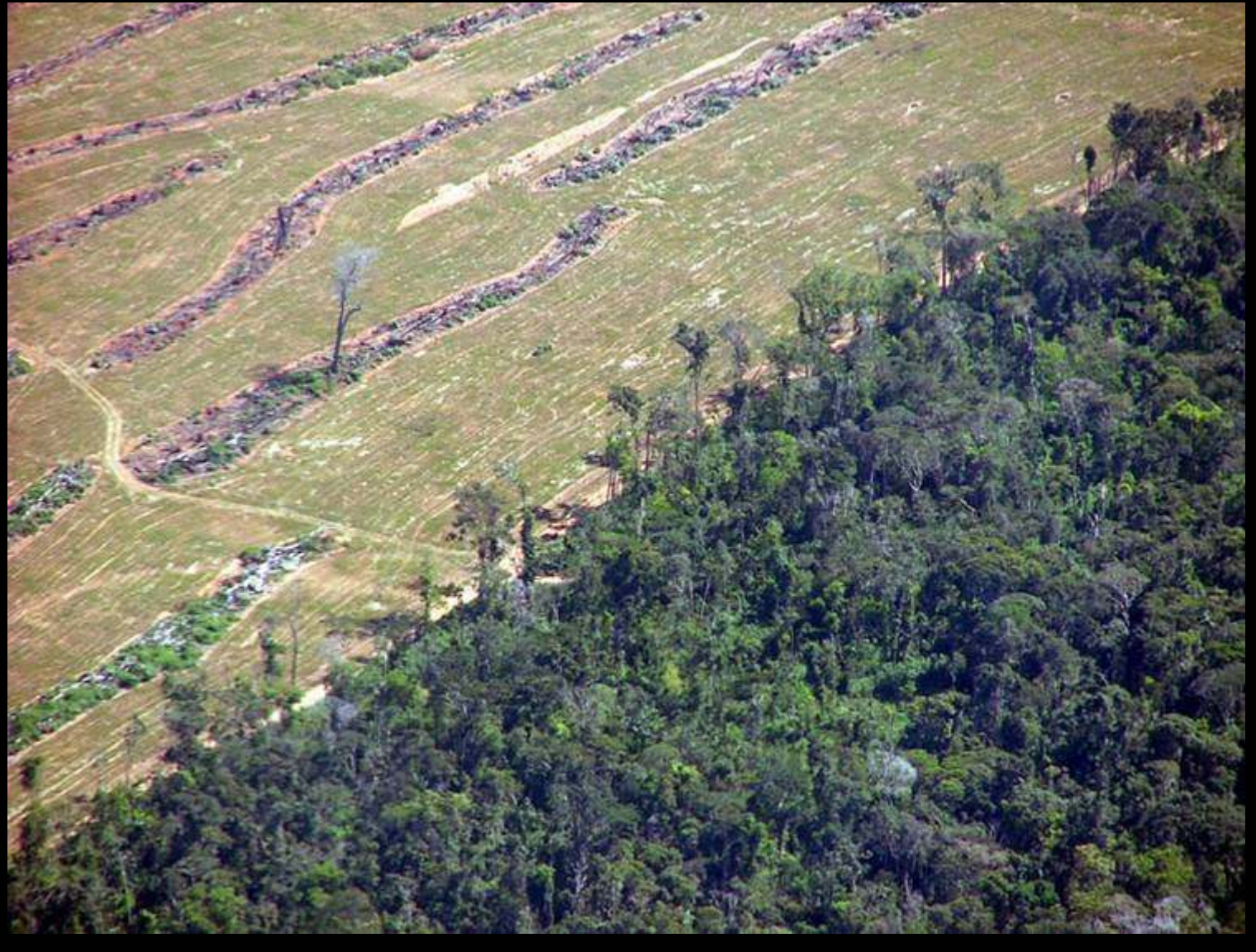


Expansão da soja 1970 - 2003

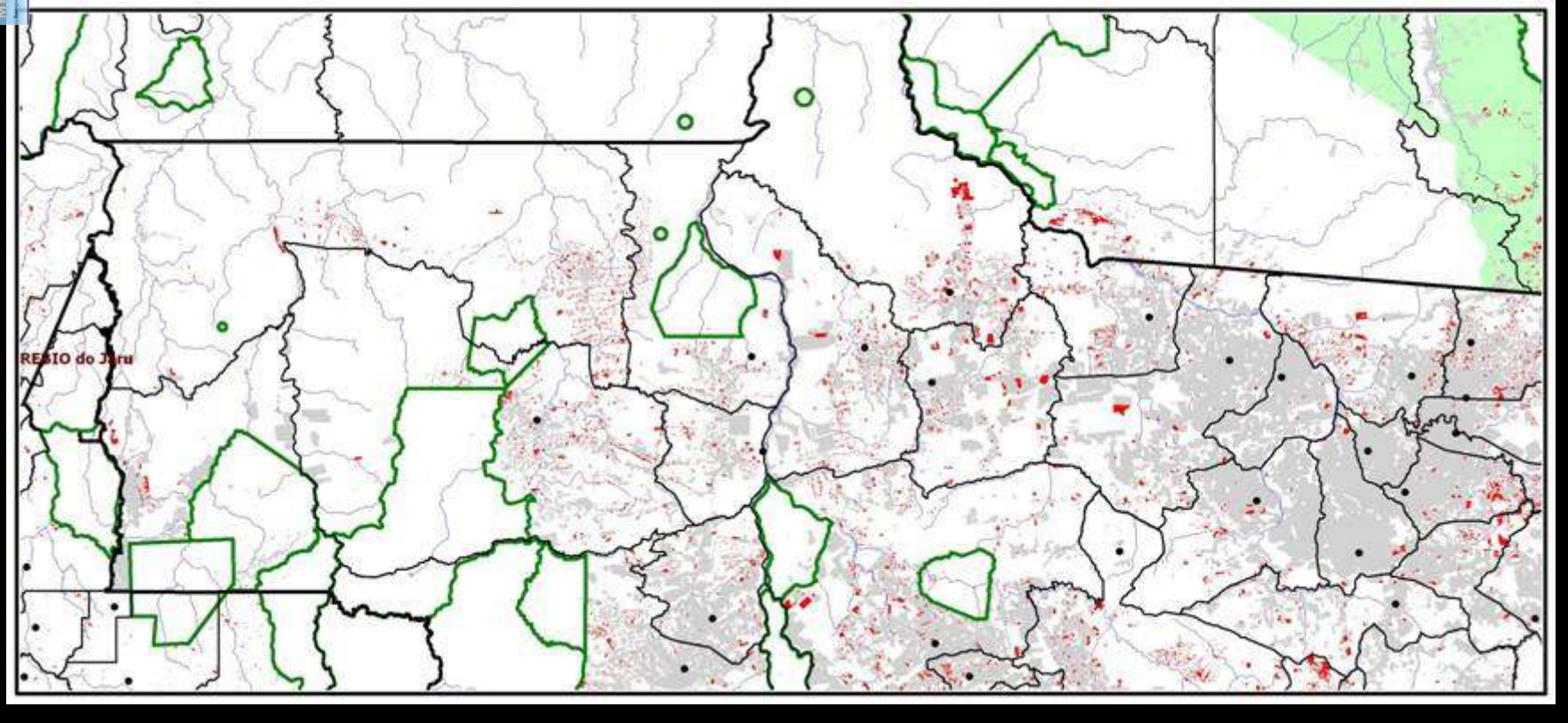
Soja invadindo a floresta

Soja

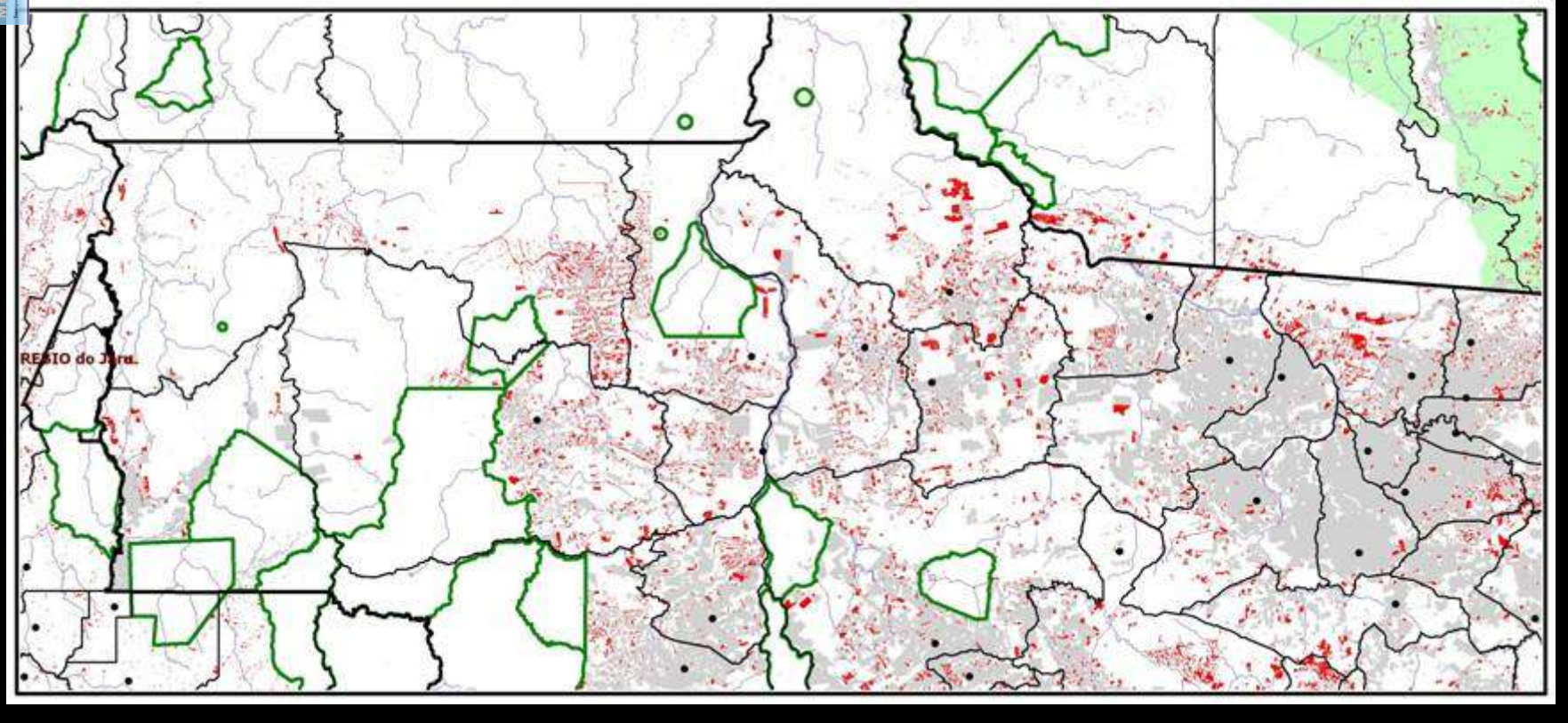
Mato Grosso



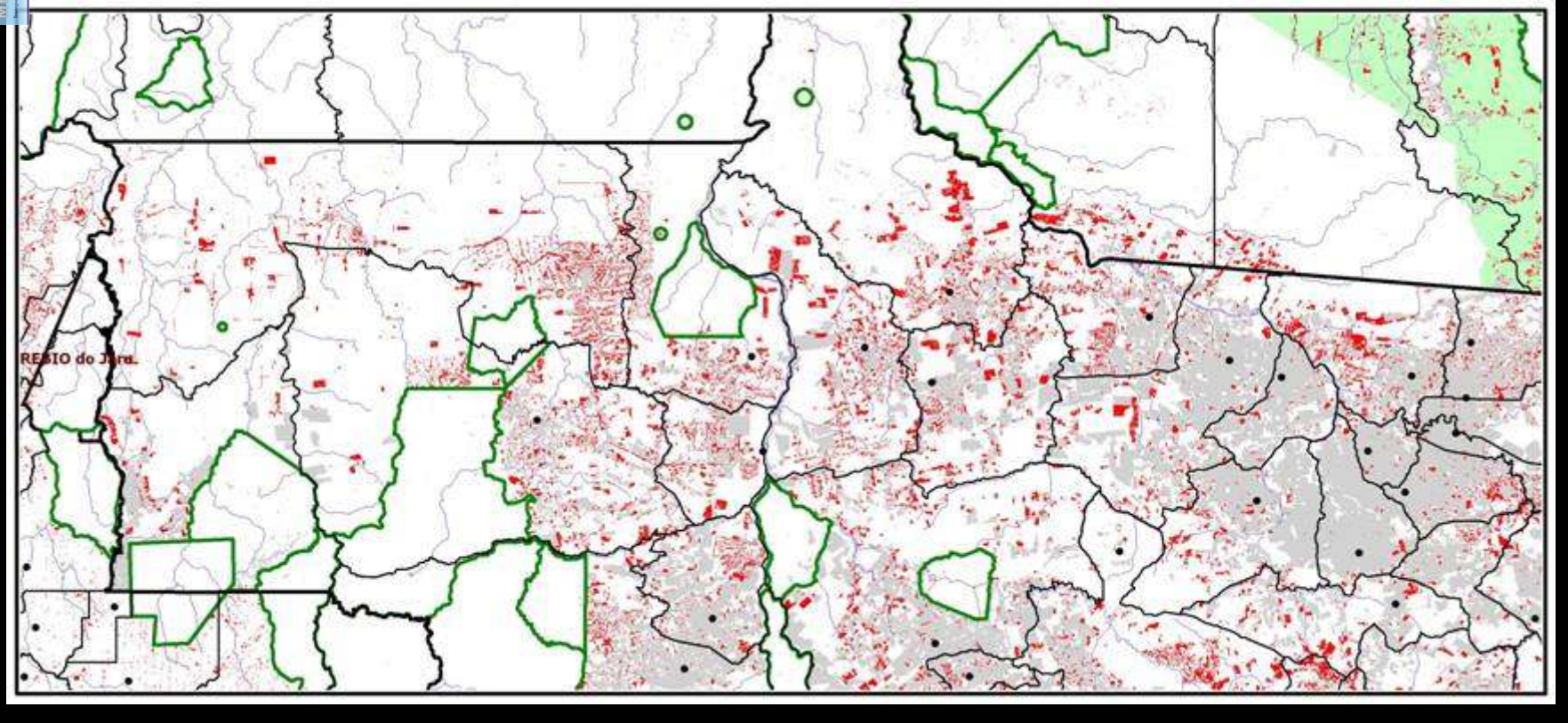
Expansão da pecuária 2002



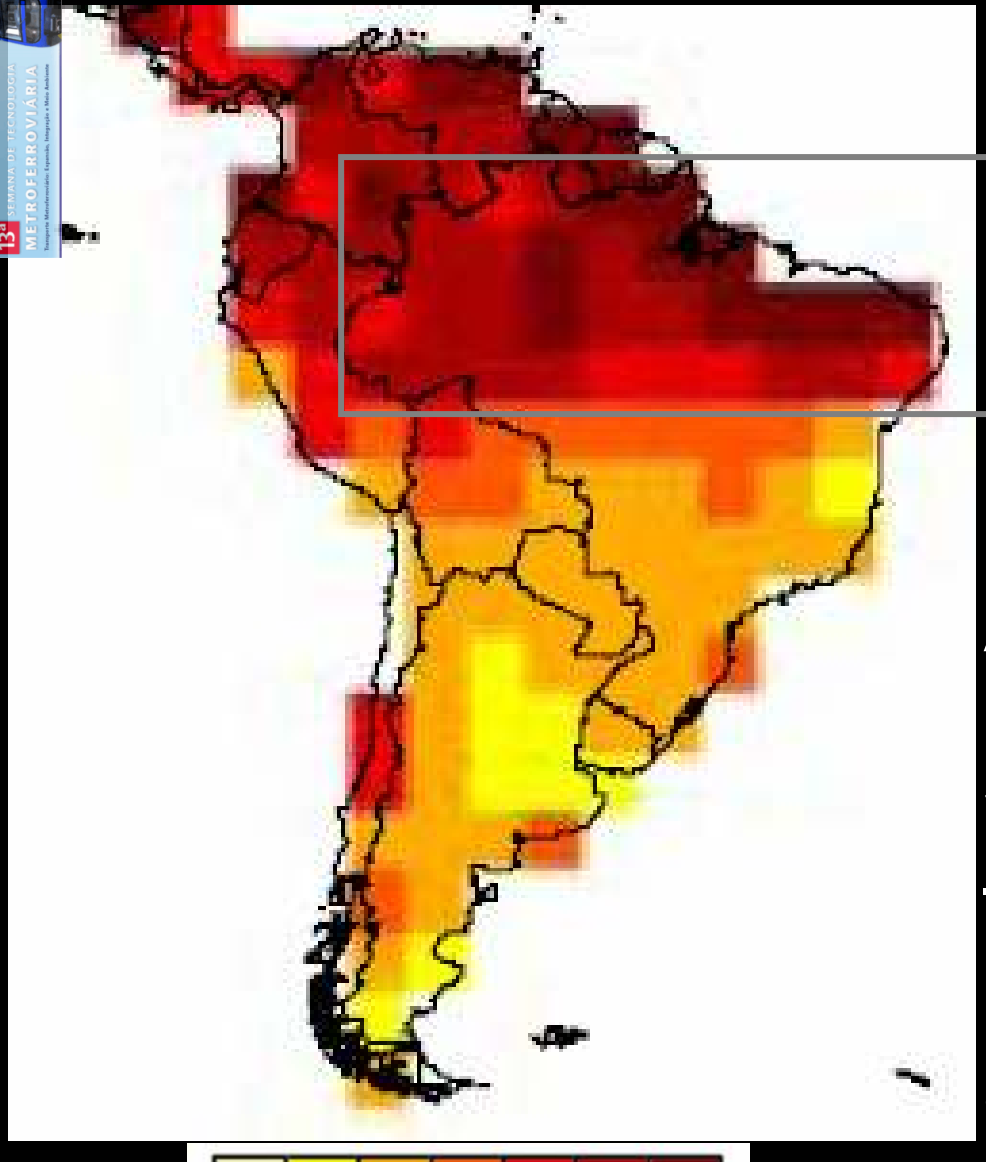
Expansão da pecuária 2003



Expansão da pecuária 2004



Índice de Mudanças Climáticas CCI na América do Sul para o futuro (preparado pelo Instituto Meteorológico da Suíça)

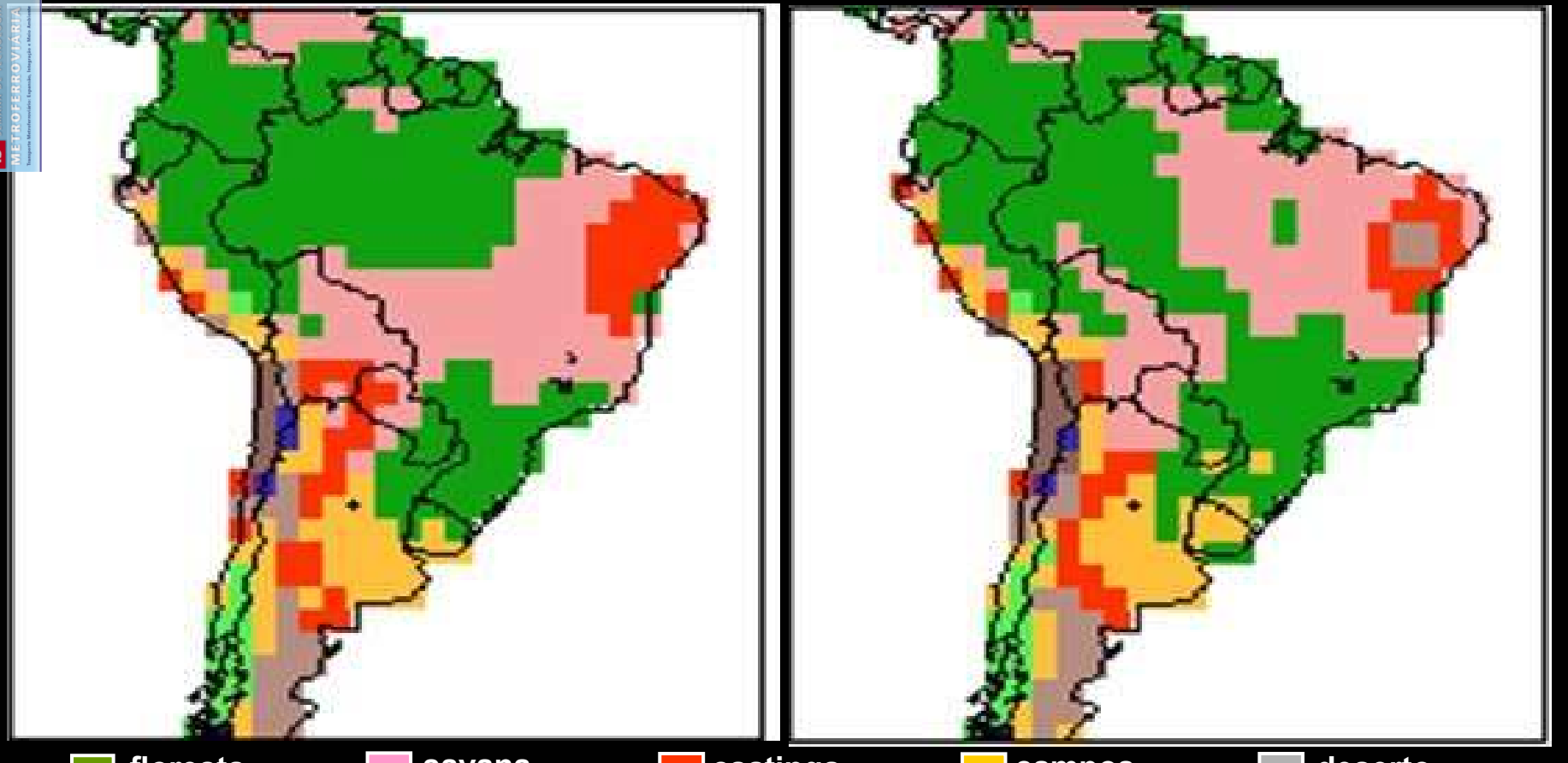


Regiões mais vulneráveis a mudança de clima

Amazônia e Nordeste constituem o que poderia ser chamado de *climatic change hot spots* e representam as regiões mais vulneráveis do Brasil às mudanças de clima.

Jose A. Marengo CPTEC/INPE

Futuro dos Biomas Amazônicos?



Savanização da Amazônia: um estado de equilíbrio na relação bioma-clima?

Jose A. Marengo CPTEC/INPE

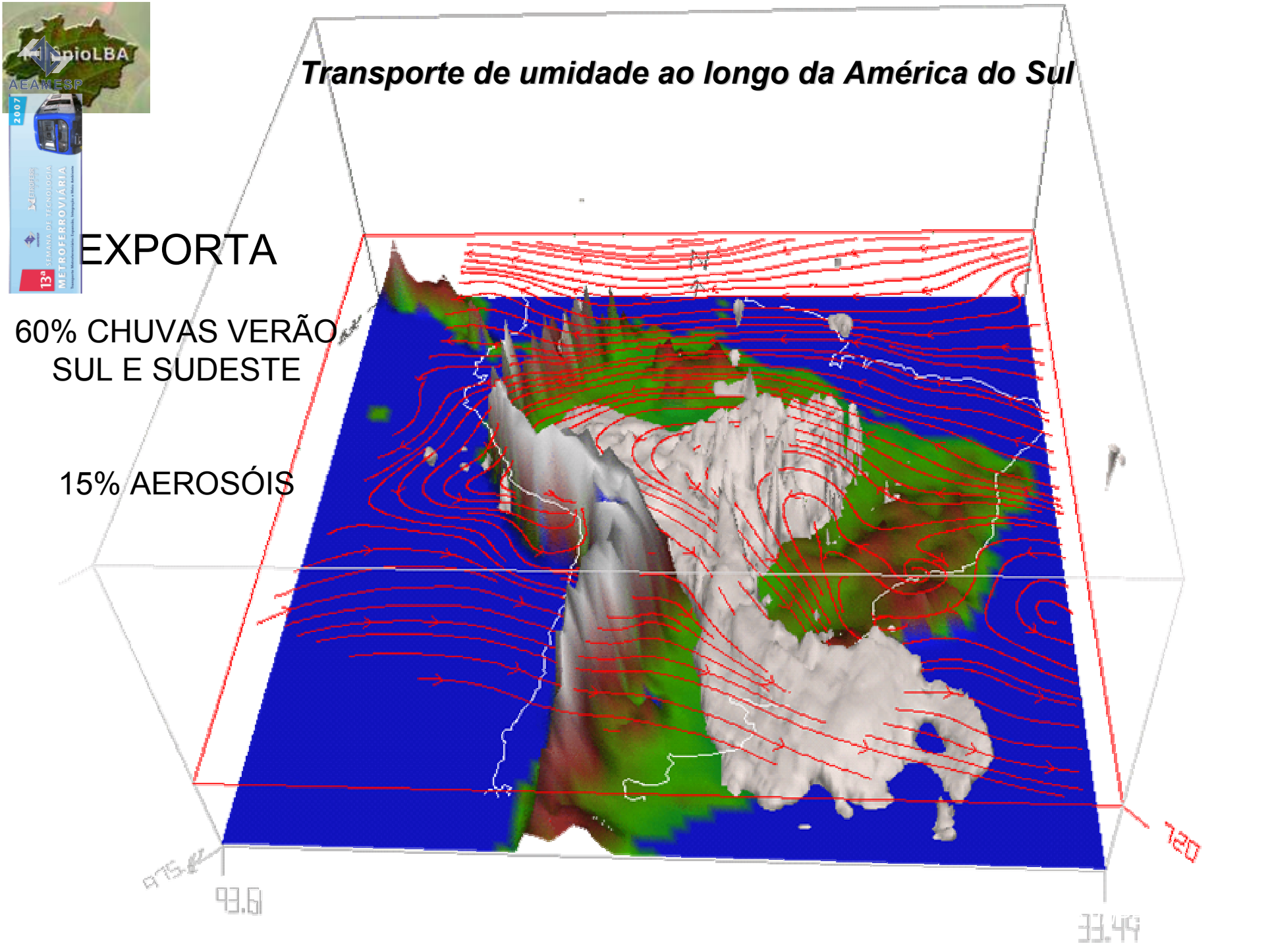
fonte: Oyama and Nobre, 2003

Transporte de umidade ao longo da América do Sul

EXPORTA

60% CHUVAS VERÃO
SUL E SUDESTE

15% AEROSÓIS



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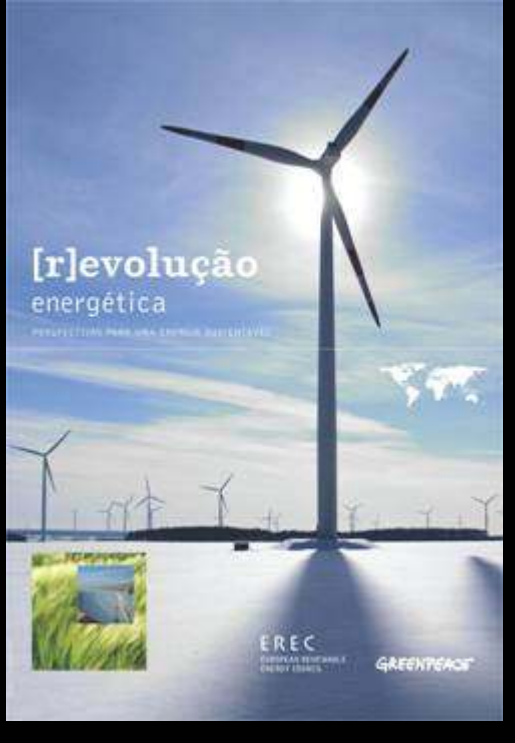
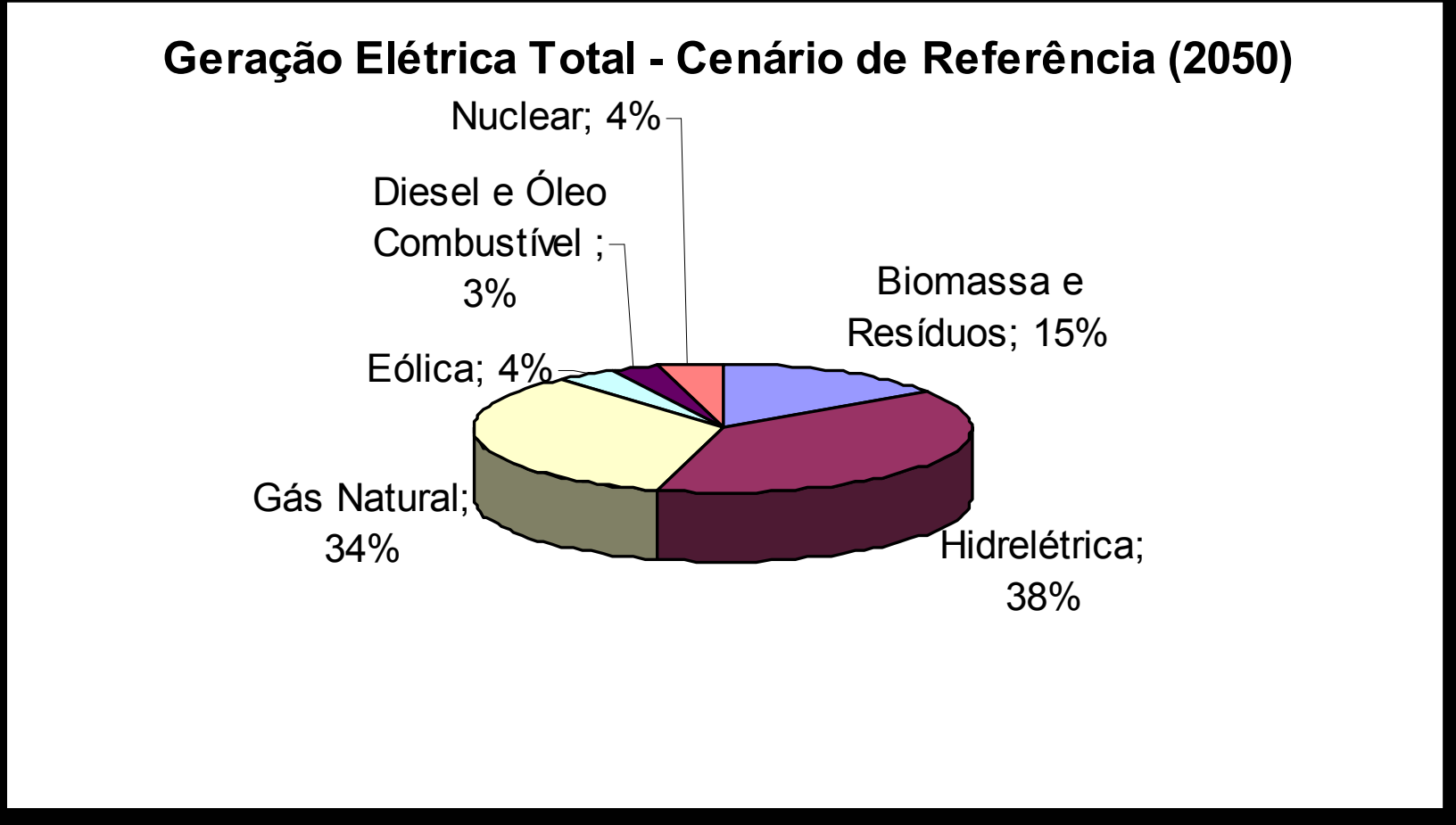
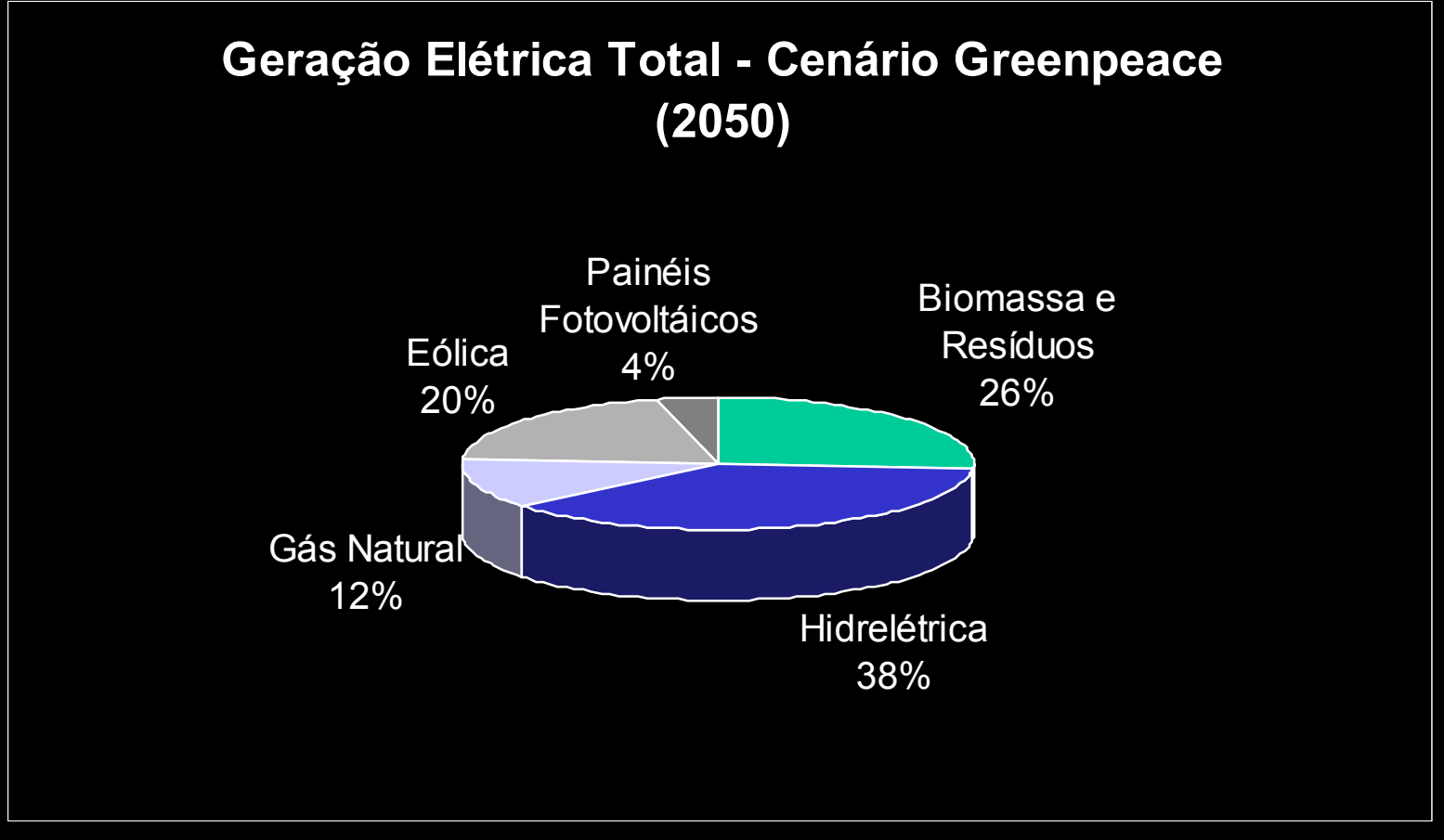
energia limpa para o Brasil e o mundo



Distribuição da Geração Elétrica (2050) Cenário Gov. Federal



Distribuição da Geração Elétrica (2050)
Cenário de [R]evolução Energética



matriz elétrica limpa
caminho da revolução energética

- Biomassa – salvaguardas sócio-ambientais e avanço tecnológico 26%
- Eólica – maior expansão 20%
- Solar fotovoltáico – 4%
- Eficiência energética – 29%
- Hídrica – 38%
- Participação das renováveis 88%

matriz elétrica limpa caminho da revolução energética

- Custo cenário referência 530 bilhões reais em 2050.
- Custo cenário revolução energética 350 bilhões reais em 2050.
- Diferença de 180 bilhões (70 bilhões com eficiência energética e 110 bilhões custo menor)

matriz elétrica limpa
caminho da revolução energética

- Tecnologias renováveis 79GW 2005 para 310 GW em 2050 – 4 vezes em 44 anos
- Políticas públicas de incentivo para energias limpas mais abrangentes e ambiciosos
- Eliminação de combustíveis fósseis e nuclear
- Gás – energia de transição 12% 2050
- Hídrica – crescimento menor 38% 2050


Economize energia.
Troque lâmpadas incandescentes por fluorescentes.
Desligue aparelhos domésticos quando não estiverem em uso.
Deixe o carro na garagem e utilize o transporte coletivo e a bicicleta, quando possível.

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2007
13ª
SEMANA DE TECNOLOGIA
METROFERROVIÁRIA


SAVE OUR PLANET!
GREENPEACE
...SEND BUSH BACK TO HIS!

“… os impactos das mudanças climáticas paralisarão alguns e motivarão outros a agir e contribuir para que a humanidade possa encontrar a luz no fim do túnel”.

ainda a tempo para agir…

AEAMESP

conto com vocês

muito obrigado

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www.greenpeace.org.br