



UNITED NATIONS UNIVERSITY



Coltlex

# **Water Conflicts in Mexico: The Río Bravo between United States of America and Mexico: A Case for Hydro-Diplomacy**

**Úrsula Oswald Spring  
28<sup>th</sup> of July 2006**

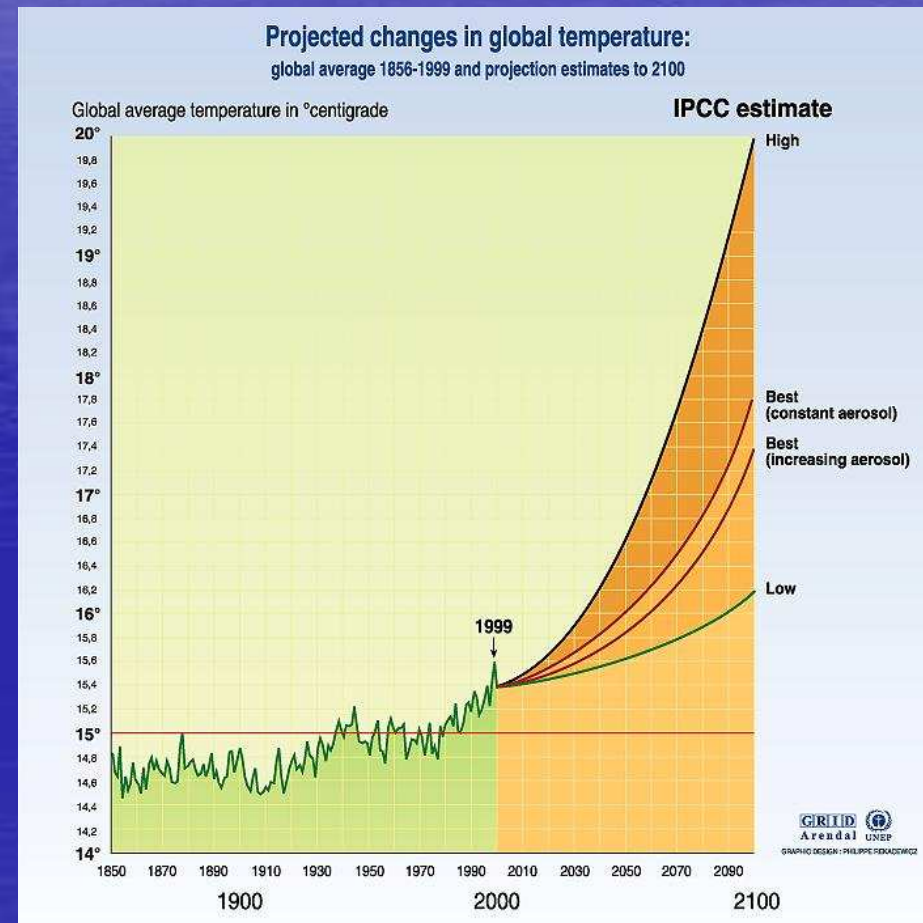
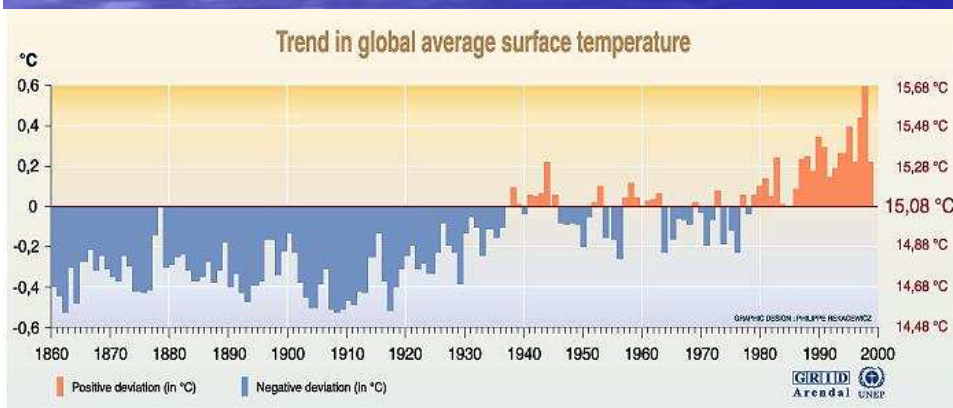
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# 1. Global Climate Change: Temperature Increases & Sea Level Rise

## 2 Climate Change Impacts: Temperature & Sea level Rise

- ❖ Global average temperature rise in 20<sup>th</sup> century: **+ 0.6°C**
  - ❖ Proj. temperature rise: 1990-2100: **+1.4 – 5.8°C**
- Sources: IPCC 1990, 1995, 2001



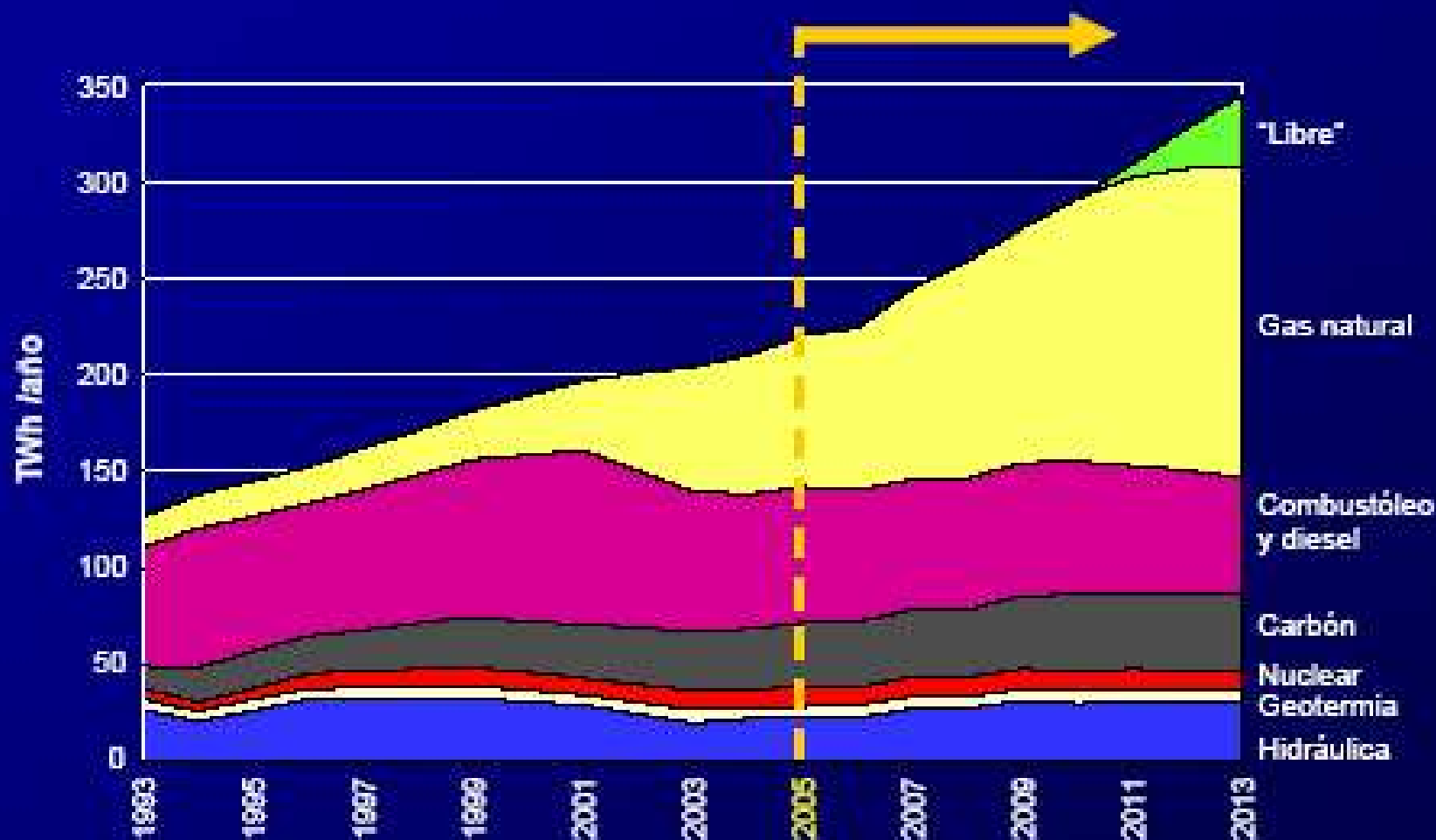
## **2. Climate Change as a New Security Challenge, Social and Physical Vulnerability:**

### **Water Wars: Climate change may spark conflicts**

- **Britain's Defence Secretary, John Reid, pointed to violent collision between a rising world population & shrinking world water resource: global warming. Climate change may spark conflict between nations and British armed forces must be ready to tackle violence.**
- **„We see uncertainty growing ... about the geopolitical and human consequences of climate change. "Impacts such as flooding, melting permafrost & desertification could lead to loss of agricultural land, poisoning of water supplies & destruction of economic infrastructure.**
- **"More than 300 million people in Africa currently lack access to safe water; climate change will worsen this dire situation".**

### 3. Repercussions for Mexico: Use of Energy

- Power sector: A growing dependence on natural gas...

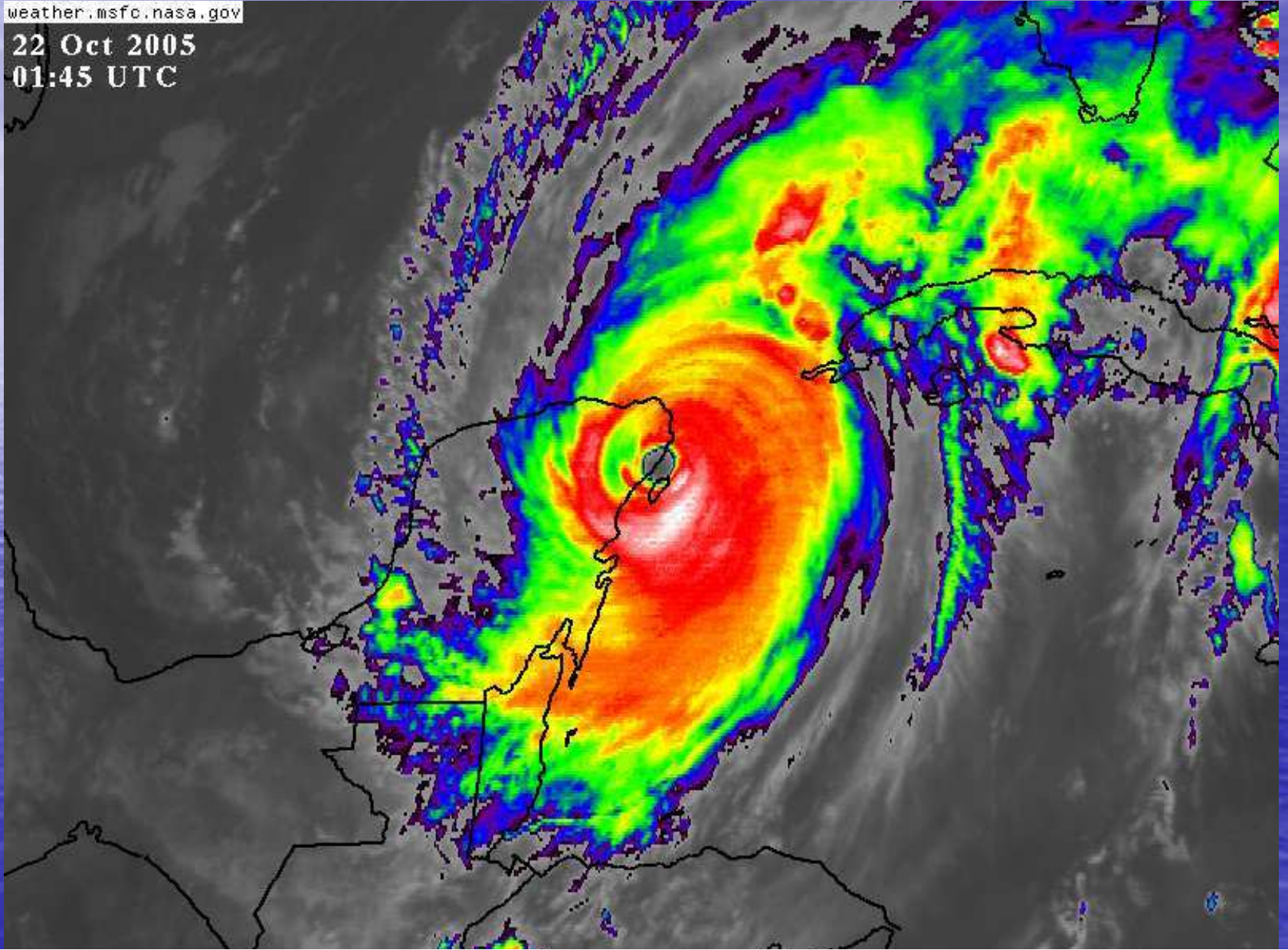


Elaborado a partir de la Prospectiva del Sector Eléctrico 2004-2013

# 3.1. Hurrican Wilma

weather.msfc.nasa.gov

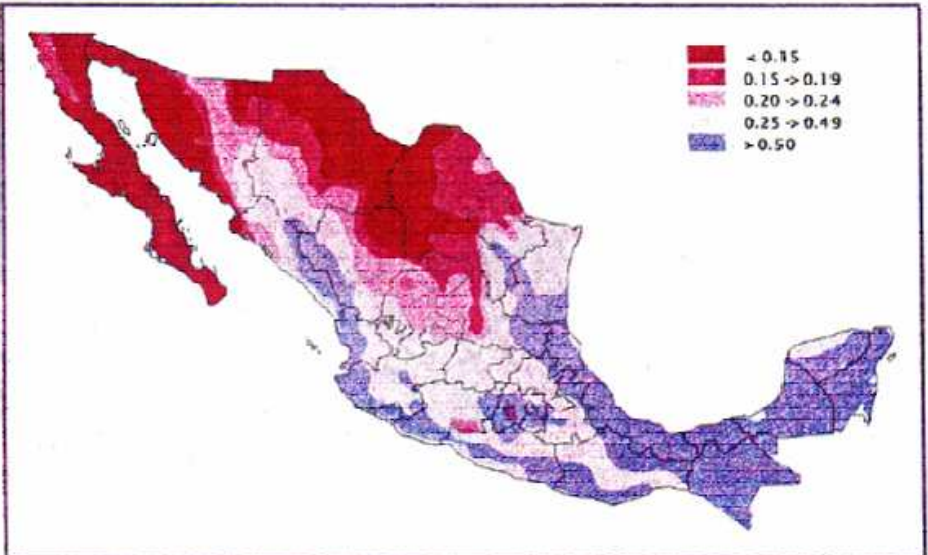
22 Oct 2005  
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# 3.2. Desertification, Migration and Conflict

## – Case of Mexico: Annual Aridity & Precipitation

Index of Aridity

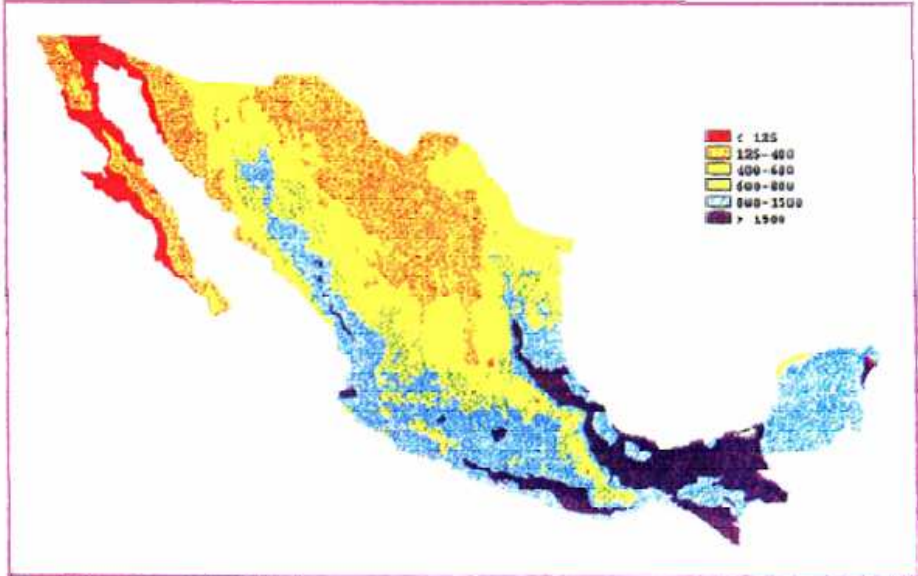


Ratio between annual precipitation and average evaporation

< 0.15	very arid area (desert)
0.15 - 0.20	arid area
0.20 - 0.25	semi arid area
0.25 - 0.50	dry and subhumid area
> 0.50	humid area

Source: Atlas Nacional del Medio Físico de México de INEGI, Mapas Temáticos de INEGI, Atlas Nacional de México de INEGI

Annual Precipitation

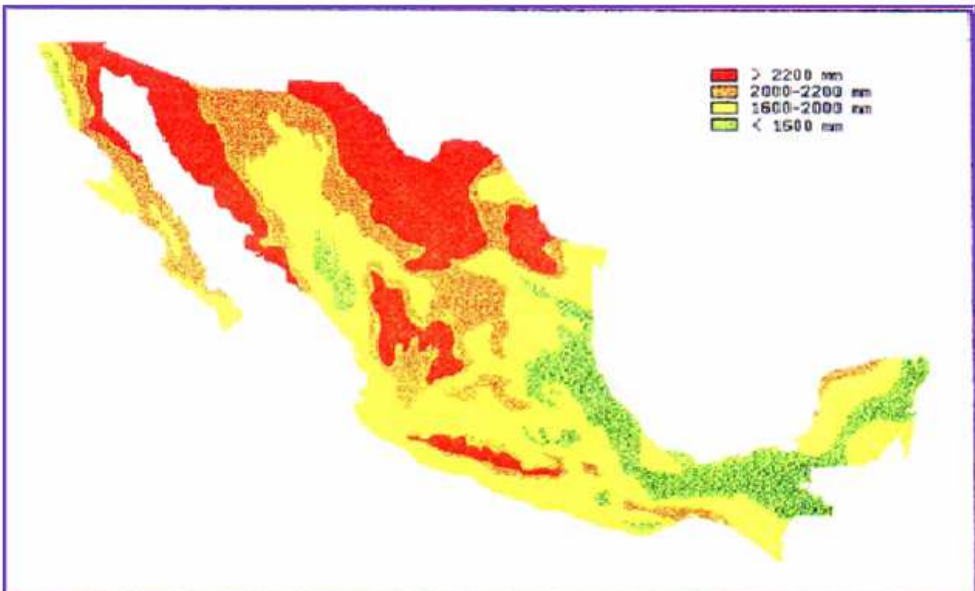


0 - 125 mm	0 - 5 inches
125 - 400 mm	5 - 16 inches
400 - 600 mm	16 - 24 inches
600 - 800 mm	24 - 31 inches
800 - 1500 mm	31 - 59 inches
> 1500 mm	> 59 inches

Source: Atlas Nacional del Medio Físico de México de INEGI, Mapas Temáticos de INEGI, Atlas Nacional de México de INEGI

# 3.3. Dryness and Desertification in Mexico: Annual Evaporation & Dry months per year

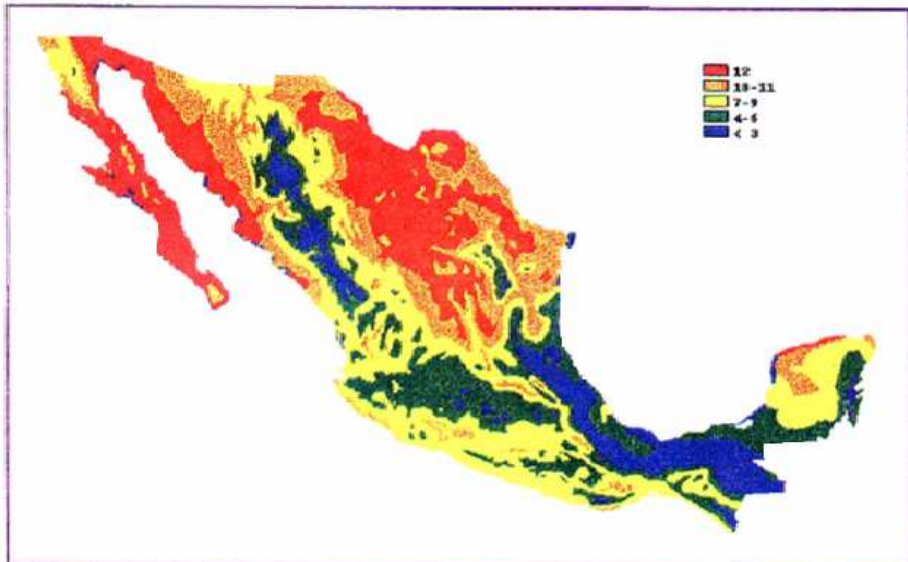
Average Annual Evaporation



> 2200 mm	> 83.6 inches
2200 - 2000 mm	78.7 - 86.5 inches
2000 - 1600 mm	62.9 - 78.6 inches
< 1600 mm	< 62.8 inches

Sources:  
Atlas Nacional del Medio Físico de México de INEGI  
Mapas temáticos de INEGI  
Atlas Nacional de México de UNAM

Average Number of Dry Months Per Year

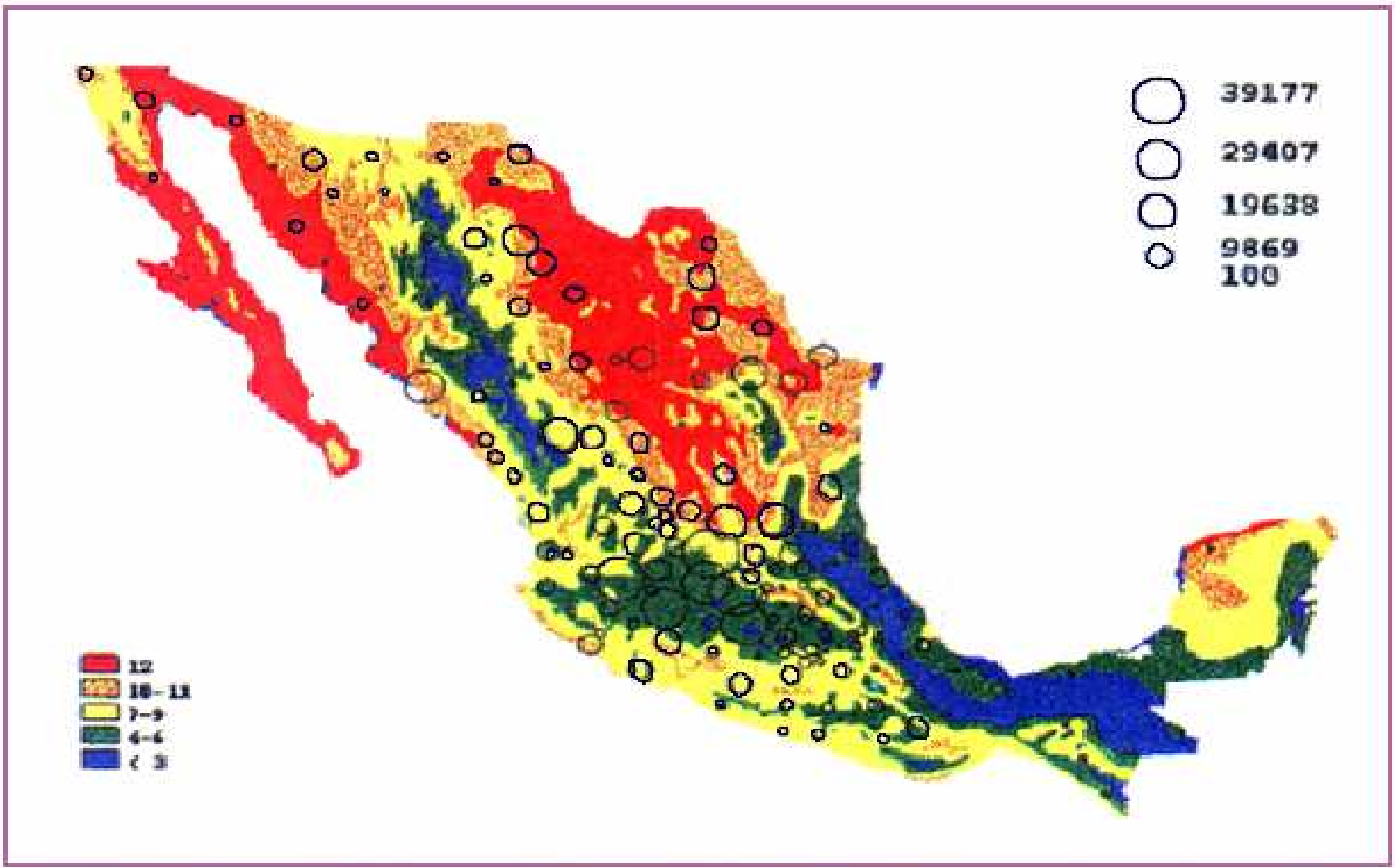


Months:	12	arid area
	10 - 11	semi-arid area
	7 - 9	dry and subhumid areas
	4 - 6	humid area
	< 3	very humid area

Sources:  
Atlas Nacional del Medio Físico de México de INEGI  
Mapas temáticos de INEGI  
Atlas Nacional de México de UNAM



### 3.4. Number of Dry Months and Migration



Number of dry months and flow (estimation for 1993) of Mexican migrants living and working in the US, surveyed on the border on their return to Mexico (spatial distribution according to their region of birth in Mexico, rural and urban localities).

Sources:  
 Survey on Mexican-US migratory flow (COLEF)  
 Atlas Nacional de México de INEGI  
 Sistema de Información Geográfica y Estadística de la  
 Frontera Norte (COLEF-DES-FON)

# 3.5. Social Vulnerability: Internal Inequity in Mexico

<b>Concept</b>	<b>% of Population</b>	<b>% of GDP</b>	<b>% of Financial Savings</b>
<b>Very Rich</b>	<b>0.23</b>	<b>40.3</b>	<b>78.0</b>
<b>Poor</b>	<b>52.7</b>	<b>18.4</b>	<b>10.0</b>

Source: INEGI, 2004 y Bank of Mexico, 2004

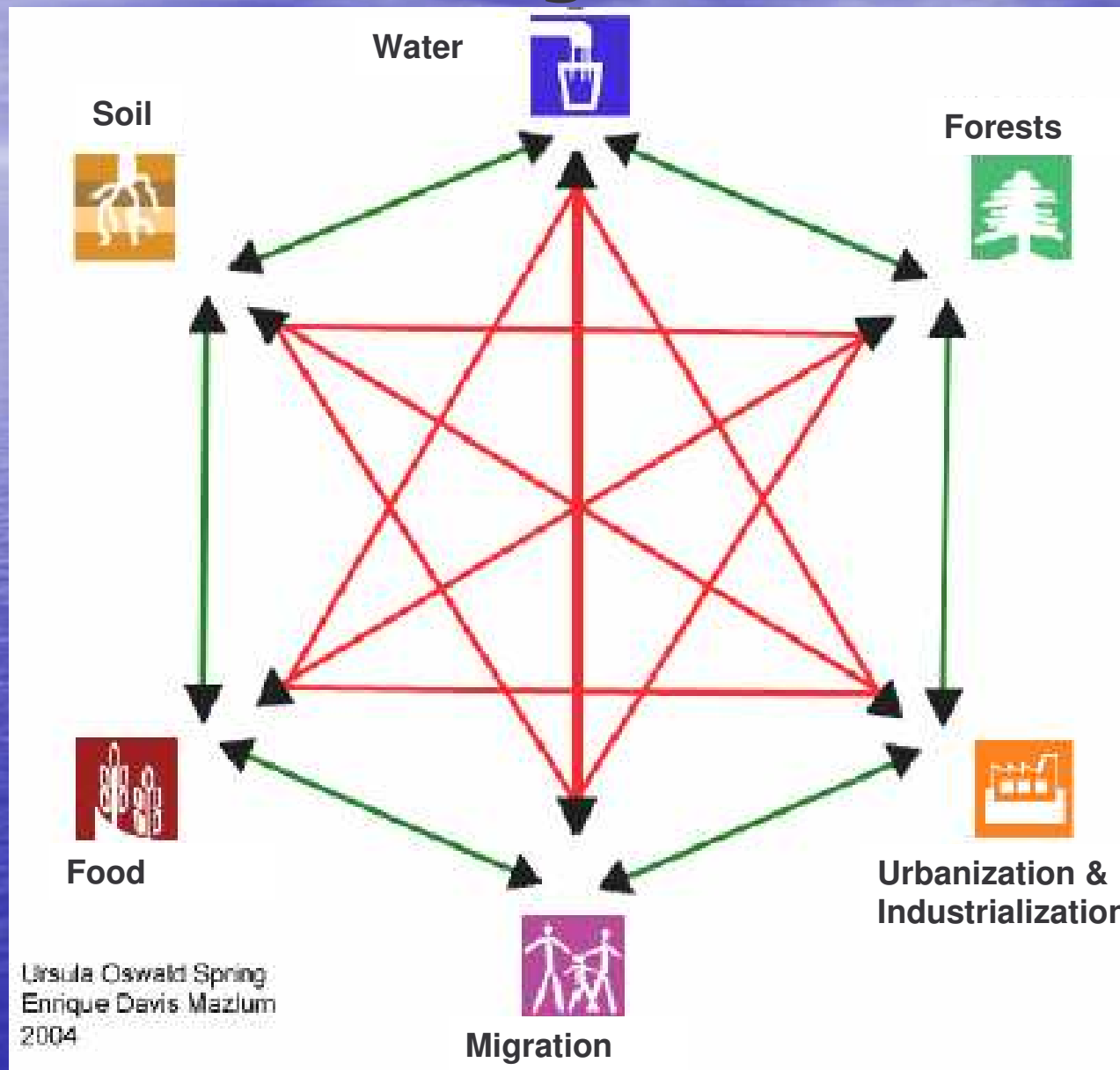
## 4. Border Region of Río Bravo



# 4.1. Localization of Río Bravo or Río Grande

- Source in the State of Colorado
- Length 1,900 miles
- Fifth largest river in USA
- Used by the US States of Colorado, New Mexico and Texas
- The Colorado River Storage Project Act (1956) authorized Glen Canyon dam and Central Arizona Project (1986)
- Used by 5 states and 11 municipalities in Mexico
- Used for domestic, industrial and agricultural purposes in Mexico
- Irrigates the Desert of Chihuahua, one of the most biodiverse deserts in the world

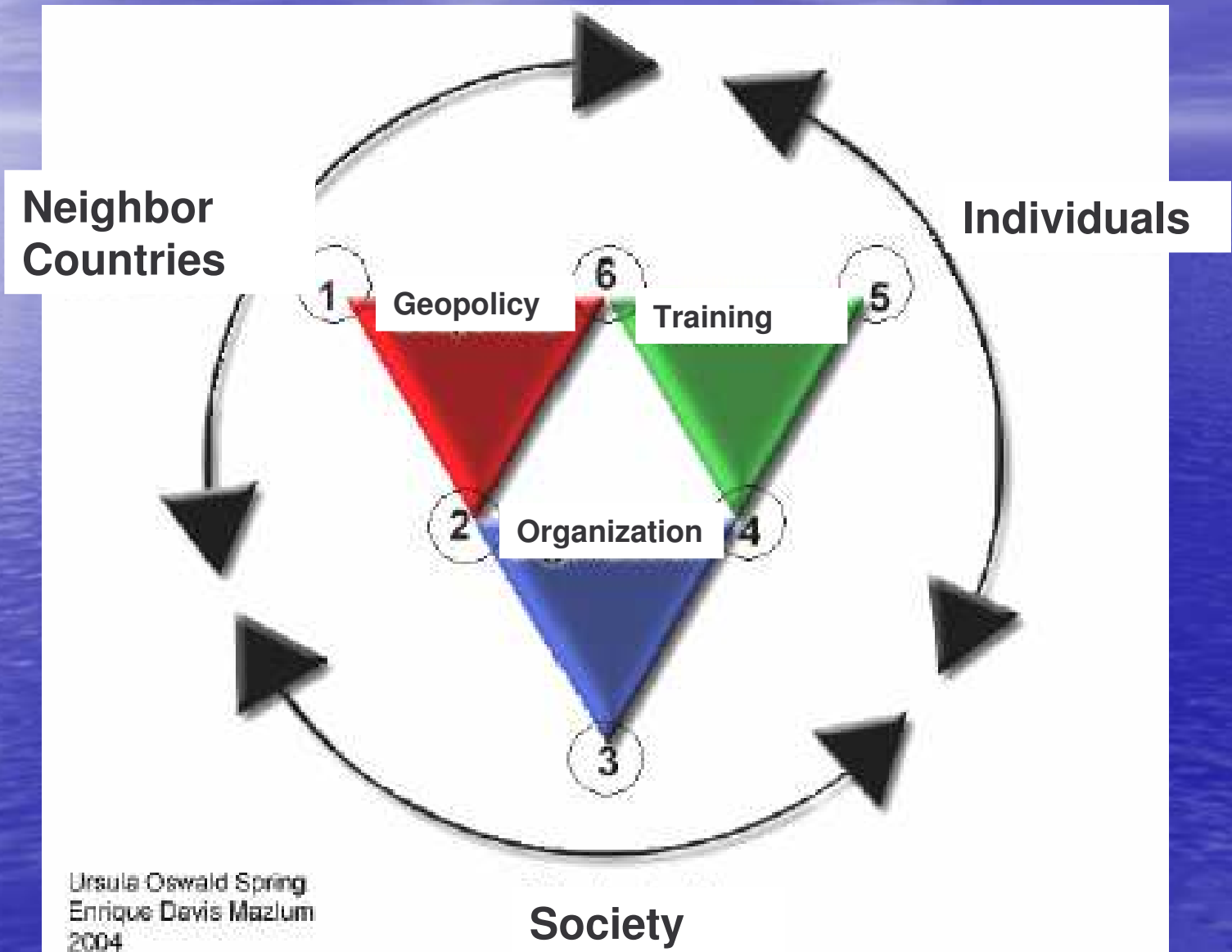
# 5. Growing Conflicts between Neighbors



# 5.1. Socio-Physical Vulnerability in Río Bravo

- International Treaty signed in 1944
- Increase of population to 10 million by migration
- Less precipitation and higher dryness
- Intensification of productive processes:
  - Growth of maquila and other industries
  - Higher demand of agricultural water
- Overexploitation of river for irrigation
- Dry-out of the river and affluents during dry season
- Depleting of aquifers
- High pollution by agrochemical, domestic and industrial waste and waste water without treatment
- Modification of ecosystems
- Destruction of biodiversity in very fragile environment

# 6. Hydro-Diplomacy



## 7. Human, Gender and Environmental Security (HUGE)

<b>Level of expansion</b>	<b>Determination  Which security?</b>	<b>Mode of expansion  Reference object Security of whom?</b>	<b>Value at risk Security of what?</b>	<b>Source(s) of threat Security from whom or what?</b>
<b>Without expansion</b>	National security (political, military dimension)	The State	Sovereignty, territorial integrity	Other States, terrorism, sub-state actors, guerrilla
<b>Increased</b>	Societal security	Nations, social groups	National Unity, national identity	(States), Nations, Migrants, Alien cultures
<b>Radical</b>	<b>Human security</b>	<b>Individuals (Humankind)</b>	<b>Survival, quality of life, cultural integrity</b>	<b>The State, globalization, nature, GEC, poverty, fundamentalism</b>
<b>Ultra-radical</b>	<b>Environmental Security</b>	<b>Ecosystem, urban and agricultural system</b>	<b>Sustainability</b>	<b>Nature Humankind</b>
<b>Trans-radical</b>	<b>Gender security</b>	<b>Gender relations, indigenous, minorities</b>	<b>Equity, identity, social relations</b>	<b>Patriarchy, totalitarian institutions (élites, governments, religions, culture), intolerance</b>



# 7.1. Ethics of Sustainable Peace-Building Security with Cooperation and Solidarity

**GS – Gender Security**

**ES – Environmental Security**

**HS – Human Security**



Multiculturalism  
 Dissipative System  
 Technological Diversity  
 Pleasure, Happiness  
 Creative Efforts  
 Agathos & Kalos  
 Local Self-Sufficiency

Civilizational Process  
 Globalization/Solidarity  
 Nets and Relations  
 Ethics to Care  
 Multiplicity /Plurality  
 Transversal Policy  
 Plural Decision-making

Bottom-up Political Participation  
 Bio-Socio Cultural Collaboration  
 Care for Vulnerable  
 Permanent Evaluation & Adaption  
 Regional Peace Building  
 Global Well-being  
 Healthy and Beautiful Environment



**Thank you for your attention**

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