Climate change impacts on Wildlife: a science-policy perspective from Mexico

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Miami, Florida USA
May 12, 2009

Special Climate Change Program (PECC)
Undersecretary for Planning - SEMARNAT

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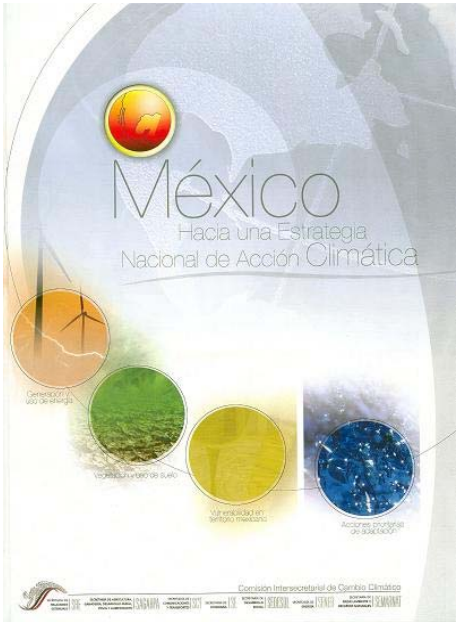
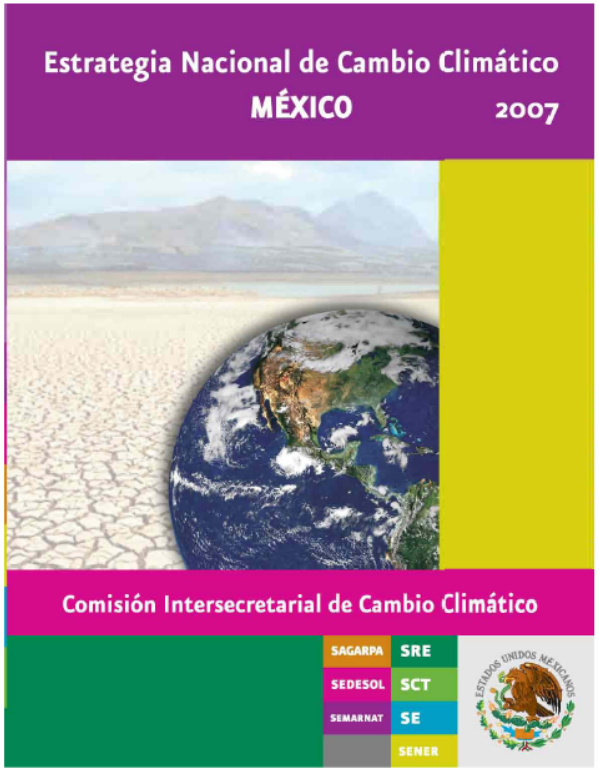


November 2006



May 2007

Special Climate Change Program

5 June 2009

Vivir Mejor

HENAC
2005-2006

ENACC
2007

PECC
2008-2012

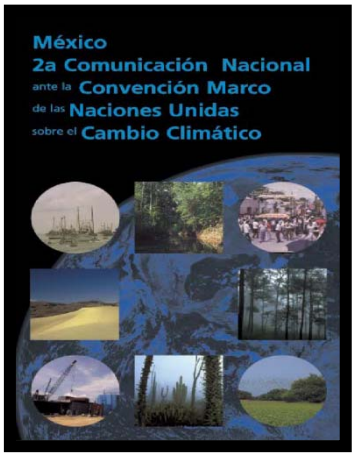
INE is a decentralized body of the Ministry of Environment and Natural Resources: a member of the "SEMARNAT" family.

Mandate: coordination of research that provide inputs for environmental decision-making.

Regarding Climate Change, INE is in charge of:

- Developing National Communications to UNFCCC
- Preparation of National Greenhouse Gas Inventories
- Studies on GHG mitigation options and policies
- **Impacts and Vulnerability assessments by sector**
- **Studies on local and national adaptation options**
- Coordination of State-level climate action plans.
- Support international negotiations
- Provide technical advise for preparation of PECC.

- The Third National Communication was presented in Nairobi in November 2006. It follows the GEF procedures “Guidance on Stocktaking and Stakeholder Consultation”



We are currently preparing the Fourth National Communication to the UNFCCC, which should be ready for Copenhagen in December 2009.

Mexico: Third National Communication to the UNFCCC

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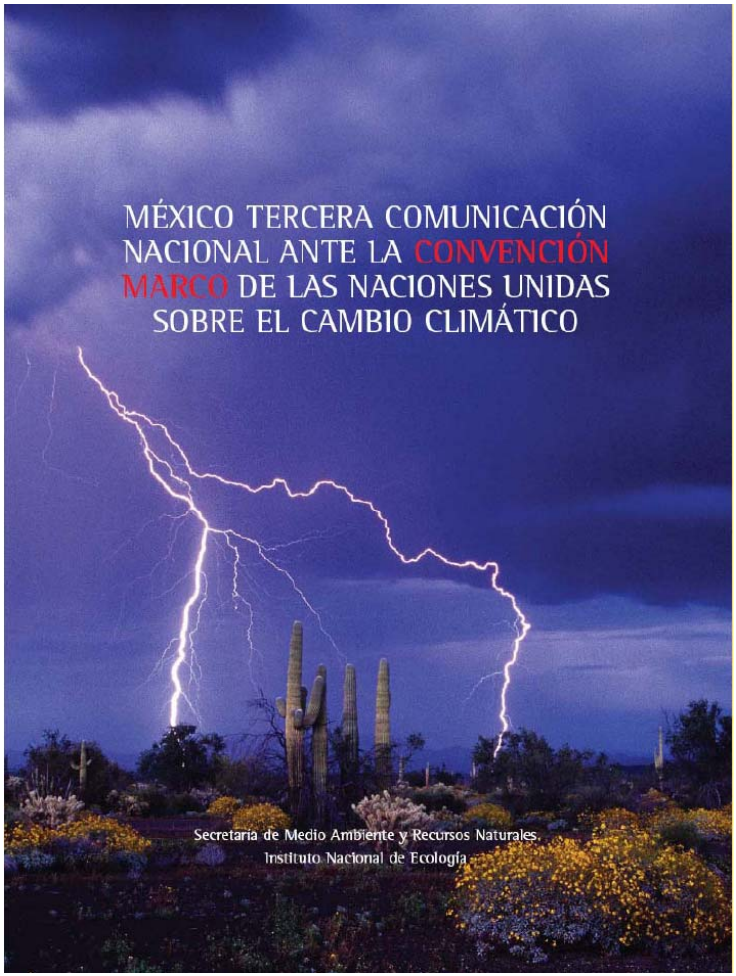


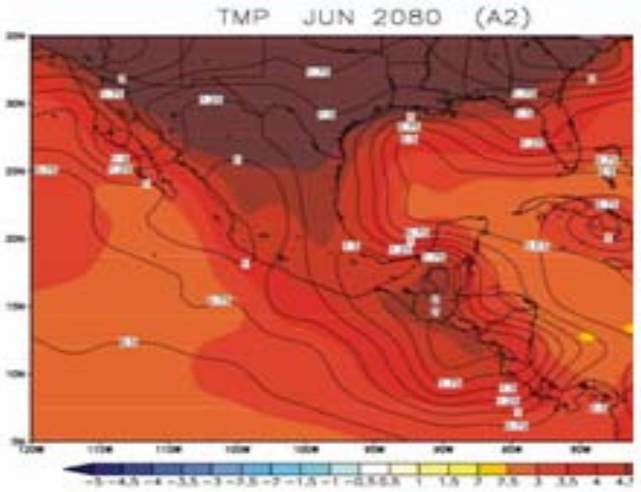
Introduction,
Executive summary (Spanish and English)

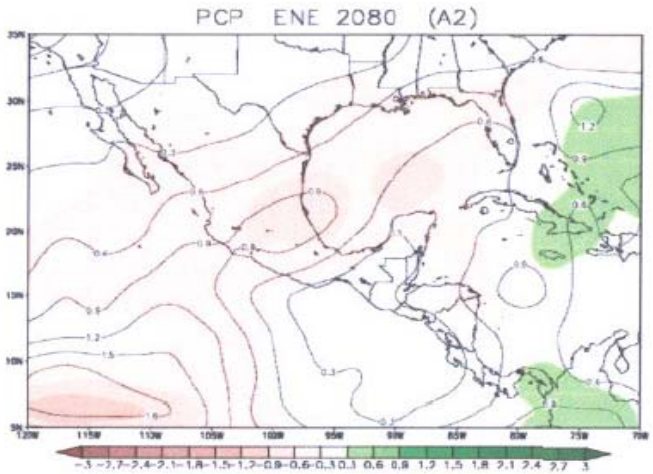
I. **National circumstances.**
II. **National GHG Emission Inventory (1990-2002).**
III. **Institutional arrangements to implement the Convention.**
IV. **Programs and measures to facilitate adequate adaptation to climate change.**
V. **Programmes and measures to mitigate climate change.**
VI. **Other relevant information: Research, systematic observation, education and public awareness, capacity building and technology transfer, international cooperation.**
VII. **Constrains and gaps, and related financial, technical and capacity needs.**
VIII. **References.**

http://www.ine.gob.mx

Scenarios for temperature and precipitation in Mexico

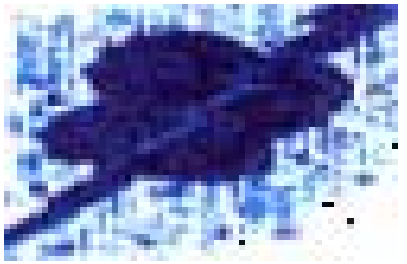
- It is very likely that temperatures will be between 2 and 4°C warmer on average for 2050-2080 (as compared with 2000), with the greatest increase in the North.
- Precipitation during winter will decrease by 15% in the central portion of Mexico, and 5% in the Gulf region.
- During summer, 5% less rain in the central portion of México.
- Rain season will be delayed.

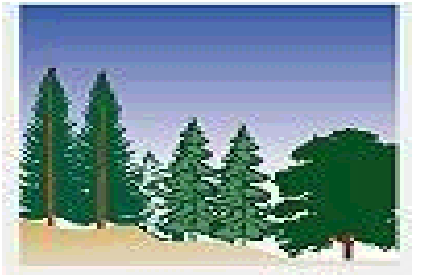




Most important effects of climate change in Mexico

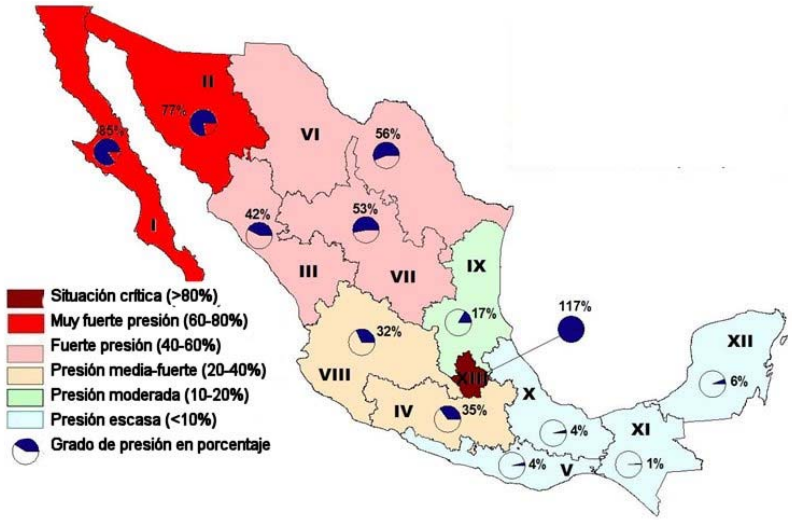
- Growing desertification in the Central and Northern portions of Mexico.
- Reduction of agricultural potential, compromised water supply in several areas.
- Flooding in coastal areas (mainly the Gulf of Mexico and parts of the Yucatán peninsula).
- Increase of extreme events (hydro-meteorological events (more intense hurricanes).
- Impacts on human health
- Forest degradation, increase in number and extension of fires, severe hydrological effects
- **Loss of biodiversity**.



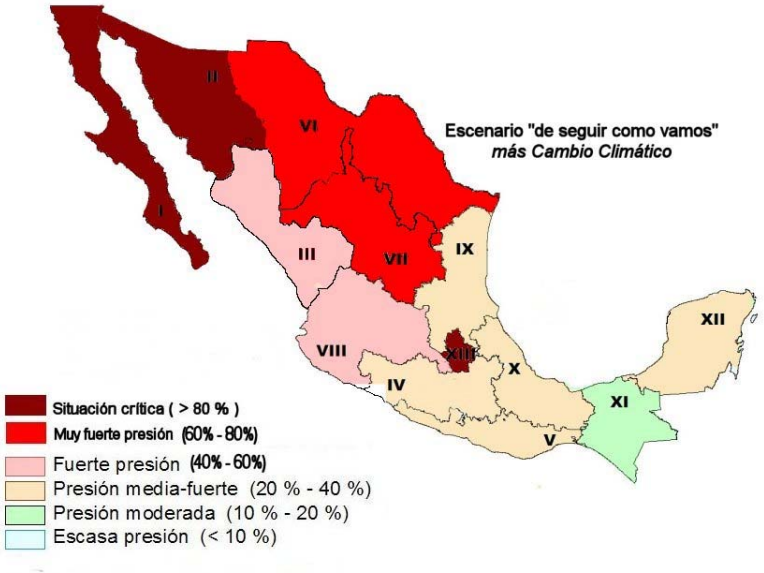


Water availability: projections to 2030

Stress on water as a resource - present day



Stress by 2030



- Increased **stress on water availability** is expected, this is worsen by the pressure already imposed by population growth and wasteful irrigation practices.
- At the national level, a 10% decrease on water availability is expected by 2030, compared to 2000.
- **Baja California and Sonora**, on the Northwest of Mexico, will be facing a critical situation. The South and Southeast of Mexico, including the Yucatan Peninsula, may face a medium to high stress over water availability.

Hydro-meteorological phenomena

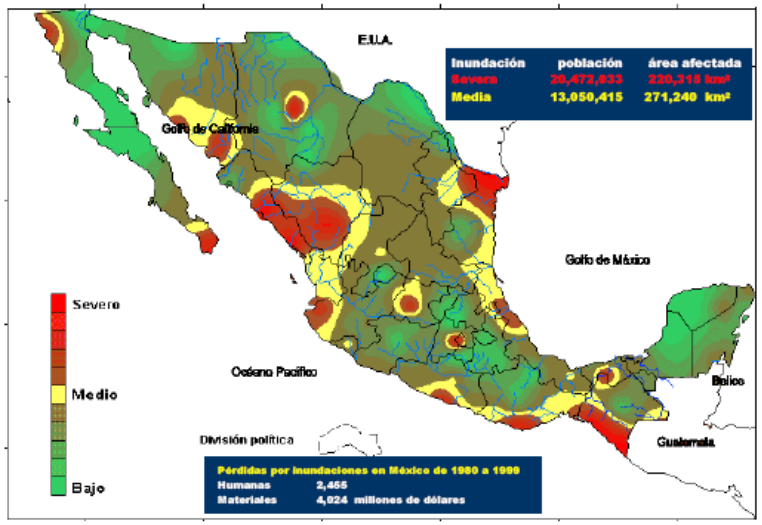
- In average, four high intensity **hurricanes** hit the Mexican territory every year, producing intense rain, floods and landslides.

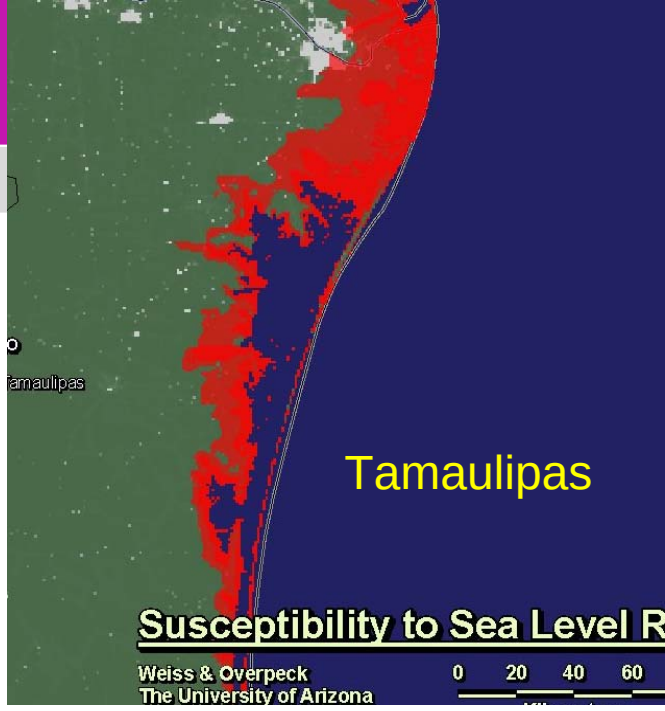
- **Heavy rain** generates intense streams of water in rivers and mudslides that have destroyed infrastructure, such as houses, hospitals, schools and roads.

- **Hailstorms** affect some agricultural land, obstruct sewage systems, and cause damages to structures in urban areas.

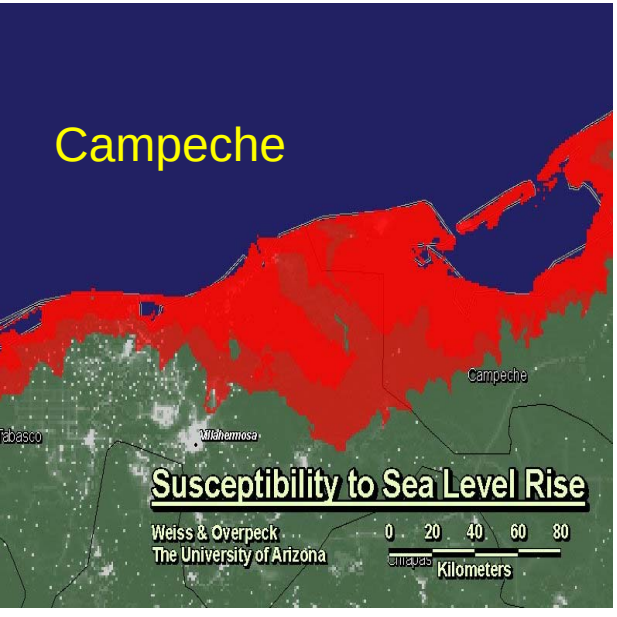
- **Droughts** cause severe economic losses to stockbreeding and agriculture for periods of months to years.

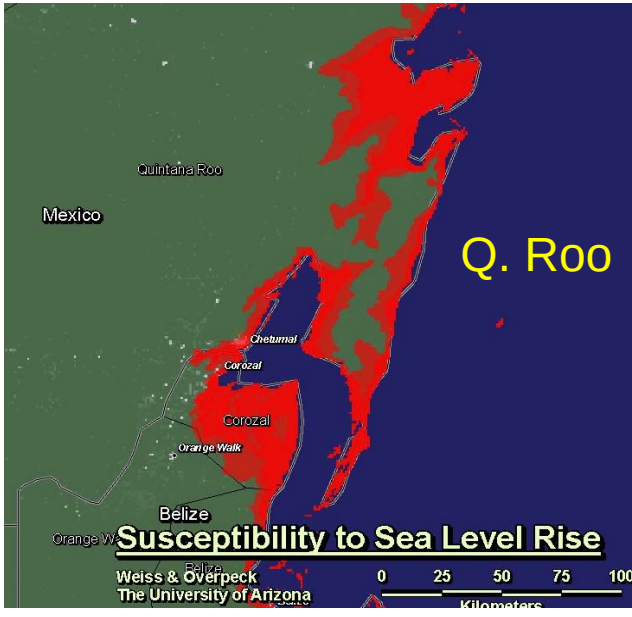
Zones with floods in Mexico





Sea level rise scenarios in different coastal areas





State-level Climate Action Plans

- To strengthen the local capacity to analyze CC impacts and to design and implement policies related to climate change.
- To induce cooperation among institutions in all relevant sectors: local & federal government, NGO, private, general public, I, in order to support policies and actions related to climate change.
- To take advantage of the “local” knowledge of climate change-related issues, and to support capacity building.
- To improve public knowledge and perception about climate change impacts, vulnerability and adaptation at the state and local levels.
- **Veracruz and Nuevo León will be completed in 2009, 18 more States will have a draft Plan by the end of 2010.**
- Funding from UK government, US EPA, IDB. WB, INE, Conacyt, etc.

What is included in the State Plans

- Assessment of greenhouse gas **emissions** (state-level emissions inventory)
- Modeling of climate change impact scenarios at the state-level
- Analysis of the state vulnerability to CC (by regions and by sectors)
- Impacts to agriculture, fisheries, tourism, health, **biodiversity**.
- Analysis of the legal and institutional framework, and of socioeconomic factors
- Design and evaluation of possible climate change mitigation and adaptation measures
- Outreach activities, public presentation, media campaigns

Biodiversity loss in Mexico

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- Megadiverse country with a high level of endemism
- Seriously threatened
  - Changes in land use
  - Pollution
  - Depletion of natural resources
  - Illegal trade of endangered species
  - Invasive species
  - Climate Change

- Ecosystem fragmentation (loss of connectivity)
- Loss of ecological niches
- Shifting of the original distribution of species and ecosystems
- Reduction in the adapting capacity of ecosystems (resilience)
- Already significant habitat reduction in Southern Mexico partially due to climate change

Climate change and conservation

- High priority should be given to endangered and endemic species
- Conservation vision must change from static to dynamic
- There will be differential responses from individual species. Communities unlikely to respond as a unified entity. Some ecosystems will expand but populations balance may change.
- Ecological succession stages may be different from current/known ones.
- The possibility of abrupt climatic changes poses unpredictable challenges to conservation and management of ecosystems
- Need for a different design of natural protected areas
- Maintaining, expanding and creating new conservation corridors will be crucial to save endangered species
- Need for unprecedented coordination and collaboration between existing agencies (join planning and budgeting)

Studies in progress at various agencies:

- Preliminary assessment of the impacts, vulnerability and adaptation of Mexican corn varieties and their wild relatives under climate change
- Characterization and assessment of the priority conservation areas for priority species under climate change
- Climate change and deforestation effects on the spatial distribution of selected species of vertebrates included in NOM-059.
- Biodiversity adaptation to climate change impacts on the coastal wetlands in the Gulf of Mexico
- Rainforests of central Veracruz: ecology and history in times of fragmentation and climate change

Forthcoming 2009-10:

- Climate change impacts assessment on pollinators and their impact on the agriculture in Mexico.
- Pro-arbol as an instrument for conservation under CC impacts
- Synergies between climate change and invasive species.

Some research priorities for Mexico

1. Identify CC signals and indicators in plants and animals (changes in population density, distribution, etc.)
2. Identify and quantify how extreme events (meteorological) affect biodiversity.
3. An assessment of the impacts of CC on the distribution and abundance of endemic and endangered species
4. Identify seasonal biological phenomena that affect biodiversity could also affect agriculture and cattle ranching practices (e.g. pollinators)
5. Assess the capability for dispersion and adaptation of invasive species under CC scenarios as well as implications on biodiversity conservation: physiological and phenological effects.

Some research priorities for Mexico

5. Assess the potential effects of CC on Natural Protected Areas in México trough an analysis of vulnerability, changes in structure, phenology and composition to set priorities in the establishment of biological corridors, the design of new natural protected areas.
6. Identify vulnerable areas to desertification to assess potential impacts on biodiversity.
7. Assess impacts of CC on productivity, distribution and diversity of grasslands.
8. Studies on genetic variability and its importance under climate change scenarios (e.g. wild varieties of corn).
9. Opportunities and needs for assisted migration.

10. In coordination with CONABIO & CONANP, INE is currently sponsoring research projects on Biodiversity and CC and on Invasive Species: Instituto de Biología & Instituto de Ecologia (both at UNAM), Instituto de Ecologia (Xalapa).

Breakout groups

1. **Policy and planning**: put impacts of CC on Biodiversity higher in the policy-making and research agendas. Link with economic and productivity impacts useful (eco-services).
2. **Science needs**: prediction of ecosystem changes and forecasting of adapting potential, identify most vulnerable species
3. **Building resilience** in our management of wildlife and ecosystems (needs good understanding of #2)
4. **Monitoring and assessment**: how to assess change and evaluate effectiveness of management? First to put the necessary monitoring projects in place.
5. **Education, outreach and engagement**: How to educate the public about the challenges. In the short term easier to do regarding mitigation (consumption patterns) than adaptation (of wildlife)
6. **Coordination & cooperation** among agencies. **Proposal: Creation of a Trilateral Committee CC & Wildlife Working Table (cross-cutting, including invasive species)**

THANK YOU

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