

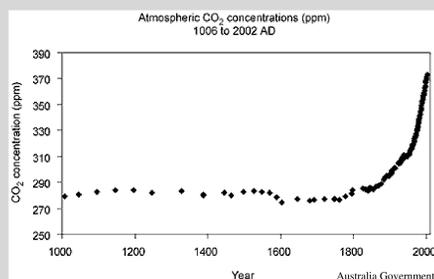
"Protecting Wildlife for Our Children's Future"

Douglas B. Inkley, Ph.D., Senior Science Advisor, National Wildlife Federation

The Existence and Cause of Global Warming are NOT in Debate

"There is now strong evidence that significant global warming is occurring...It is likely that most of the warming in recent decades can be attributed to human activities."— *Joint science academies' statement: Global response to climate change, 6/2005.*

The current concentration of heat-trapping CO₂ in the atmosphere of 379 parts per million is more than 30% higher than the pre-industrial level, and higher than any time in the last 420,000 years.

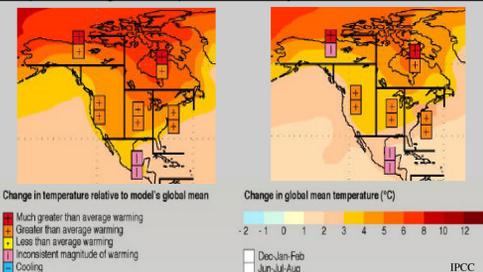


Scientists can trace this excess carbon dioxide directly to extensive burning of fossil fuels and deforestation.



As a result, the average global surface temperature has risen more than 1° F during the past century. With business as usual emissions, the CO₂ concentration could become more than twice the current level by 2100, and temperatures could rise another 2.5-10° F.

Anticipated changes in temperature in 100 years for two climate models.



As the atmosphere heats up, local climate systems are rapidly being altered in ways that directly affect forests, lakes, prairies, rivers, wetlands, and other habitats as well as the fish and wildlife that depend on them.

Fewer, but more intense precipitation events

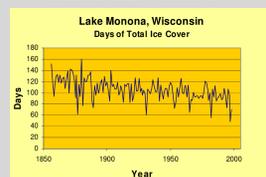


Tropical storms more intense (not more frequent)



RAPID CHANGE

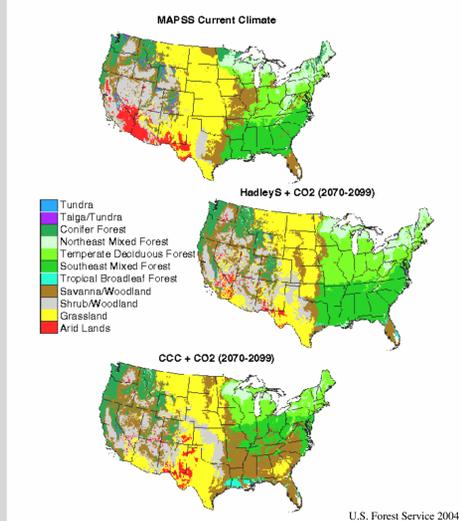
Reduced winter ice cover



RAPID CHANGE

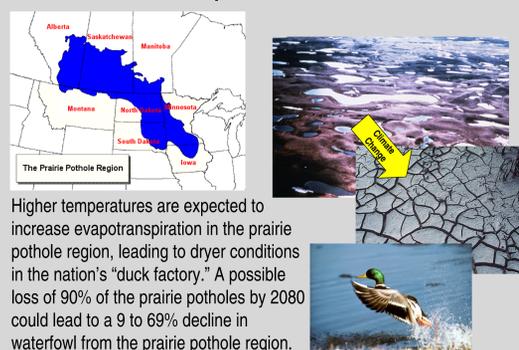
Climate Change Alters Habitats

Anticipated changes in habitats in 100 years for two climate models.



Potential Effects on Wildlife

Potential Waterfowl Population Effects



Endangered Species Especially Vulnerable



The small ranges of endangered species make them especially vulnerable to catastrophic events that could destroy their entire population.

Endangered species often have very specific habitat requirements, making them especially vulnerable to even small potential changes in these habitats caused by global warming.

Migratory Birds

Some migratory birds have already exhibited changes in breeding range and the timing of annual migrations. The differential response of species to climate change risks 'decoupling' of important ecological relationships among species.



Cold Water Fisheries



Certain fish, such as salmon and trout, are very sensitive to water temperatures. As atmospheric temperatures rise, the warming of surface waters could significantly reduce available waters within the required temperature range of cold water fish species.

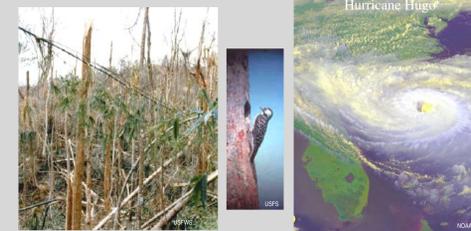
Wildlife Conservation Actions

The effects of climate change on wildlife necessitate that wildlife managers take appropriate actions now to enable wildlife to better endure current and future effects of climate change.

Wildlife managers should:

- Manage for diverse conditions.
- When using historical weather and species data for future projections, take into account climate change.
- Plan for surprises, including extreme events.

Hurricane Hugo devastated the Francis Marion National Forest in 1989, destroying 87% of the cavity trees used by the second largest remaining population of red-cockaded woodpeckers. Rapid response by the USFS to replace destroyed cavities, and the existence of other populations precluded an overall devastating impact on the species.



- Reduce nonclimate stressors on ecosystems, such as pollution, over-utilization, and habitat fragmentation and loss.
- Maintain healthy, connected and genetically diverse populations.
- Translocate individuals to maintain genetic diversity when needed.
- Protect coastal wetlands and accommodate sea level rise.



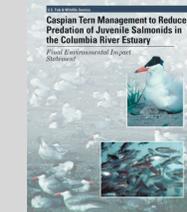
Sea level rise of up to 36 inches by 2100 threatens coastal wetlands and beaches especially on the shallow eastern and Gulf of Mexico coasts.

- Reduce the risk of catastrophic fires, while maintaining normal fire regimes.
- Reduce likelihood of catastrophic events affecting populations by increasing population sizes and distribution.
- Adjust yield and harvest models.

Population fluctuations may require adjustment of harvest levels beyond historical practices to maintain desirable populations.



- Account for known climatic oscillations such as El Niño.
- Conduct medium- and long-range planning.



Wildlife conservation objectives are more likely to be met when planning processes are implemented which account for anticipated climate change.

Wildlife Conservation Actions

- 13) Select and manage conservation areas appropriately (e.g. north/south corridors).
- 14) Ensure ecosystem processes.
- 15) Prevent and control invasive species.
- 16) Look for new opportunities.
- 17) Employ monitoring and adaptive management.

Monitoring is essential for early detection of unexpected environmental changes and implementation of adaptive management.



Protecting Wildlife for Our Children's Future

All wildlife are potentially at risk from climate change. Only through action now can we help protect wildlife for our children's future.

The polar bears of Hudson Bay are already declining. In just 20 years the period of ice coverage has declined by an average of 20 days, contributing to a decline in the local polar bear population of about 20%.



What is their future?

Personal Actions

Personal actions now can help reduce the carbon debt we are creating in the future for wildlife, their habitats and our children's future.



Contact information and Citation

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Inkley, D.B., M.G. Anderson, A.R. Blaustein, V.R. Burkett, B. Felzer, B. Griffith, J. Price, and T.L. Root. 2004. *Global climate change and wildlife in North America*. Wildlife Society Technical Review 04-2. The Wildlife Society