Climate Change

The first thing to know about the causes, is whether we are dealing with an 'act of God' or merely with the consequences of unwise use by (people).

~ Aldo Leopold

Why Care?

- We are all responsible for climate change.
- Future generations depend upon our caretaking of the earth.
- The full consequences of climate change are unknown and unpredictable.
- Animals, plants, insects and other species are affected by climate change.

Significant Implications

We've been hearing about climate change for some time, but only within the last few years have the majority of world scientists agreed that something significant is happening to the world's climate. Most scientists agree that human activities are the probable major cause of the change. Global and local climate change could overwhelm natural resource, wildlife, and habitat trends just discussed and potentially accelerate some trends.

Since the industrial revolution, in the 1700s, carbon dioxide (CO_2) in the earth's atmosphere has increased by about 30%. For a long time scientists argued about whether increased CO_2 and other greenhouse gasses, through their ability to hold more heat from the sun on earth, would impact world climate.

Because of the potential impact of climate change on the state's natural resources, in 1991 the DNR staff began looking into this issue. In that year, the DNR published a report entitled Global Climate Change - Management Strategies for Wisconsin. The report examined the potential impacts of climate change on Wisconsin's natural resources and presented recom-

City of Madison: a Leader in Climate Protection

In our "River Neighborhood" we're lucky to have Madison as a Climate Protection leader. Madison has many programs that conserve energy, natural resources and money, with more being proposed! The list below illustrates the environmental commitment that Madisonians have towards curbing the effects of climate change. For more information see: www.ci.madison.wi.us/environment/default.htm

- **Climate Protection Plan** This plan shows energy saving actions and CO_2 savings - Madison is one of about 70 cities in USA and the 1st in Wisconsin to develop and implement such a plan.

- **Sustainable Lifestyle Campaign** Started March 1999. Eighteen Neighborhood Eco-Teams (~277 people) implement practices that promote energy efficiency, water conservation, waste reduction and alternative transportation. Since its start, Eco-Teams have cut waste by 39%, reduced water usage by 41%, and cut CO_2 emissions by 5,668 lbs/household!

- **Madison Metro Powered by Wind** Kewaunee County wind farm sends 75% of its energy to Madison.

- **Alternative Transportation** Two privately operated bicycle programs provide free rental for city biking. One program has bikes available for short or long term use.

- **Dane County Rideshare** Started in 1974 with 5 vans. Now 1,300 commuters save 12,000 vehicle-miles/week.

- **City Health Department Issues Annual Report Car**d This reports on air and water quality, food safety, animal control, and chemical/physical hazards.

- **Commission on the Environment** Established in 1972 to advise the Mayor and Common Council on environmental matters affecting city.

- **Converting street lights/red stop lights** to energy-efficient light-emitting diodes (LEDs), saving energy and money.

- **Recycling** 97% citizen participation in curbside program.

mendations on actions Wisconsin can take to address climate change. The DNR went on to conduct and publish four detailed studies on Wisconsin's greenhouse gas emissions and how we can reduce them.

In 1994, the DNR established the Wisconsin Climate Change Committee to develop a strategic plan specifying the actions Wisconsin should take to address climate change. The committee had a very diverse membership, including automobile, trade and manufacturing interests, power generating industries, environmental organizations, and wide spectrum of state agencies. The report, entitled "Wisconsin Climate Change Action Plan" was published in 1998.

⛢ A copy of this report is on the DNR web site: www.dnr.state.wi.us/org/aw/air/global/WICCAP.pdf

The weight of evidence regarding climate change is compelling, but there are major unknowns. One crucial unknown, how exactly warming will progress, is related to the complexity of the earth's air, water, land, and biological systems. Another critical unknown is the degree to which people make individual and collective behavioral changes. Will societies reduce the demand for burning fossil fuels, such as oil and gas, and work to reduce the burning and removal of forests in time to prevent accelerated warming of the earth?

These are big unknowns and present difficult challenges because some forces are outside personal control. But some aren't. Through the collective effect of individual choices, each person making changes in their daily actions could have a large impact. The process is similar to how society reduced outdoor littering. Some thought then, habits won't change, people won't stop littering. But looking around neighborhoods and along roadsides, littering has dropped dramatically. Most people became aware that littering was a problem and that they could and should do something about it. Many, if not most people, are not aware of climate change and its challenges, much less what they could do about it.

So we know climate change is underway. What no one knows is - how much warmer will it get and where will it be warmer. Most scientists believe that the earth won't just simply warm up slowly and regularly over the earth. Some areas will get hotter - and surprisingly - some potentially colder. For example, if the Atlantic Ocean currents like the Gulf Stream change position significantly, England, Germany and the rest of northern Europe, because of their latitude, would become colder like Iceland and Greenland.

Some say "there'll be winners and there'll be losers" - and here in Wisconsin we could be a 'winner' with warmer winters. However, current climate scenarios based on computer models indicate how Wisconsin's climate, including the Rock River Basin, could potentially change. Some of the possible changes include: wetter winters and drier summers with longer, hotter and more frequent heat waves; poor air quality and higher concentrations of ground-level ozone; warmer and more shallow river waters; more storms, or storms of greater severity; denser algae blooms and lower oxygen levels in rivers and lakes; more frequent floods, droughts, forest fires and damaging storms; and changes in ecosystems that could affect the forestry industry and wildlife populations.

These potential changes are unsettling to think about. However, a computer model is just that - a model that 'indicates' scenarios based on the best current information. Many of the above scenarios could go completely the other direction. There are still many unknowns about atmospheric, biologic, oceanic, soil, human, and other interactions and components. However, waiting until we know with absolute certainty before taking any action, clearly could put our natural resources and our way of life in jeopardy.

Some changes in our climate have been observed locally. A study conducted at the University of Center of Limnology at the University of Wisconsin-Madison, showed that the number of days per year with ice cover on Lake Mendota has decreased by 22% since the mid-1800s. Unstudied but observed by society, over the last five years, many Wisconsin communities have seen more frequent very large storms sweep across their communities. Also, it has been observed that plants are blooming up to two weeks earlier than they did 60 years ago. Are these facts related to global climate change? We just don't know for sure.

Also, not every change may be detrimental to humans or plants and wildlife. Current research shows for example that ragweed produces increased pollen under increased CO_2 levels. While more ragweed pollen in the air isn't generally good, especially to those with serious allergies, the study shows a positive growth response in one plant species. Certainly, there may be other unexpected positive and negative responses from species.

"Who cares" say some - it'll all balance out - the winning and the losing. This view reflects limited knowledge of the connection of the earth's resource systems (touch the ecological web in one place and the web quivers everywhere) and too, a limited view of the world's economy - or better or worse, we're all connected to the worldwide economic web. It also reflects an under-appreciation of the balancing of food production and that the bulk of people live in cities dependent upon a continuous ample food supply. Significant climate changes will also affect our world neighbors living close to sea level in possibly devastating ways. Many nations and people have no high ground to go to if sea levels rise.

Our biosphere, including us, is in balance with a climate that emerged locally after the last Ice Age, or at least within the last 12,000 years. Now we're facing a potentially large warm-up occurring within 100 years, or perhaps less. Nature can and will adapt, but it's unlikely to adapt in ways that are similar to the current conditions. Climate changes likely will have a profound effect on many creatures - animals, birds and plants. Each person's behavior plays a part in producing CO_2 and other greenhouse gasses and each has a role in controlling it - or not.

The Good News!

Tremendous challenges bring out creativity, energy and leadership in people. In our Basin, we have a home based example to follow. The City of Madison is leading the effort to do its share to protect our climate. In 1998, the City through the joint efforts of city staff from the Department of Engineering and Public Health applied for a grant to the International Council for Local Environmental Initiatives.

As a result, Madison is one of only 70 cities in the nation, participating in the national "Cities for Climatic Protection (CCP) campaign." Madison is developing a local action plan to reduce citywide greenhouse gas emissions, energy use, and water consumption. The plan also calls for a public information campaign to engage city residents in protecting the climate. The CCP is a win-win strategy for city residents. Saving energy protects the environment and taxpayers pocketbooks too!

What You Can Do . . .

- Reduce, Reuse, and Recycle!
- Plant trees on your property. They absorb carbon dioxide, release oxygen and moisture to the air, and help protect your house from sun and wind.
- Turn off unused lights and use fluorescent bulbs where possible.
- Insulate your house and when you build or remodel use 'environmentally friendly' construction materials.
- Buy energy-efficient appliances and cars.
- Drive less! Consider carpooling, biking or walking to work or shopping.
- Urge your government to develop a Climate Change Control program. It helps save our environment and reduces taxes too!

To Learn More . . .

- Climate change overview:
  www.oar.noaa.gov/climate
- The science behind climate change:
  www.nsc.org/ehc.htm
- State specific potential global warming impacts
  Environmental Protection Agency (EPA)
  www.epa.gov/globalwarming
- Energy efficiency and renewable resources
  Midwest Renewable Energy Association
  www.the-mrea.org/
- Wisconsin climate change information:
  WI DNR Bureau of Air Management
  (608)266-7718