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Aug. 21, 2004. 01:00 AM

Severe thaw threatens Arctic

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Flood of warnings on climate change

Inuit way of life in danger, report finds

PETER CALAMAI
SCIENCE REPORTER

OTTAWA—A few final brush strokes are still being added to the definitive and official picture of how climate change will affect the Arctic, and how much it already has.

The result, called the Arctic Climate Impact Assessment, is scheduled for publication in November.

But a summary of the assessment obtained by the Star makes clear that environmental doomsayers were not far off when they warned that severe warming of the Arctic is inevitable, threatens the way of life of the Inuit, will alter the face of the North almost beyond recognition and has potentially disastrous global climate change consequences.

A related danger is the increased ultraviolet radiation passing through the damaged ozone layer in the circumpolar regions: Today's young indigenous people will receive lifetime doses at least 30 per cent higher than any prior generation.

These sombre warnings are the collective judgment of more than 600 scientists and other experts, mostly from Arctic countries, who four years ago began reviewing and weighing the mountain of research studies about climate change in the North. Their assessment was requested by the Arctic Council, made up of Canada, Russia, the U.S. and five other national governments plus six organizations of indigenous peoples.

While the scientific assessment is now being readied for the printers,

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Arctic Council members are still negotiating an even more sensitive document — recommendations for what should be done by governments, industry, indigenous peoples and the general public. These will include policies to adapt to the projected change, mitigate the impacts as much as possible, develop communications and education programs and improve research, monitoring and computer modelling.

All that comes before a ministerial meeting of the Arctic Council at the end of November in Reykjavik, Iceland, to approve the final policy recommendations and ideally commit the members to take action. That meeting could prove a big headache for Canada in particular because the national climate change strategy is in a shambles and the patchwork Northern science program still suffers from large gaps despite some promising recent initiatives.

One initiative that directly addresses many of the assessment's concerns is the first expedition by the CCGS Amundsen, a medium-class icebreaker refurbished as a floating polar research station at a cost of \$30 million. Currently winding up its first 12 months in the Arctic, the Amundsen is the lynchpin of two major multi-year undertakings to understand climate change from the level of microscopic plankton up to the health of Inuit communities.

But the near-final scientific report from the Arctic Climate Impact Assessment makes clear that a much greater research effort will be required from a country whose territory covers almost a third of the total Arctic. These are the 10 key findings:

★The Arctic is already warming much faster than the rest of the world and most computer projections show the increase there in average temperatures over the next 100 years will be at least double the global average. The bulk of the warming is taking place in the winter.

★This polar warming has major implications for the rest of the world. Extra freshwater emptying from the Arctic Ocean because of heavier river runoff, retreating glaciers and melting sea ice could easily disrupt the conveyor belts of deep ocean currents that carry vital warmth north from the tropics. Simultaneously the loss of snow and ice means more dark surfaces to absorb solar heat, accelerating global warming in what could become a run-away cycle.

★Vegetation zones are shifting because of the warming. Forests will replace a significant amount of the tundra and tundra plants will move north into the polar desert, so called because of the minimal precipitation. While this might mean expanded agriculture where soils are suitable, also likely are more frequent forest fires and insect outbreaks.

★The range and distribution of animal species will shift along with the changes in temperature, water and vegetation. This could push some species toward extinction and is especially crucial for polar bears, most seals, caribou and some seabirds.

★Many coastal communities and vital facilities face increased exposure to damaging storms. The extensive reduction in the extent of sea ice combined with rising water levels will let more pounding waves reach shore, increasing erosion. Especially vulnerable are Alaska and Chukotka,

the region of Russia that borders on the Bering Sea.

'To hunt, catch and

share these foods is the essence of Inuit culture.'

Summary of upcoming

Arctic Climate Impact Assessment

★Shipping through the archipelago is almost certain to increase because of shrinking sea ice, which also makes access easier to mineral and other resources. These developments raise major issues of sovereignty, security and safety as well as cultural, social and environmental concerns.

★By contrast, transportation across the surface will be severely disrupted by the accelerated thawing of vast swaths of permafrost. In the next three decades the season for haulage over "ice roads" will plunge from 200 days to about 100. Large investments will be needed in new buildings and roads and the maintenance of existing infrastructure, such as pipelines.

★Indigenous communities will be buffeted by major cultural and economic impacts arising directly from climate change, particularly the poorer prospects for traditional hunting. "To hunt, catch and share these foods is the essence of Inuit culture. A decline in ringed seals and polar bears therefore threatens not only the dietary requirements of Inuit, but their very way of life," says a summary of the assessment.

★People, plants and animals will all be adversely affected by elevated levels of ultraviolet (UV) radiation. Despite bans on ozone-destroying chemicals, the UV-screening ozone layer above the Arctic won't be restored for decades because of the counter-effect of stratospheric warming. Higher doses of UV radiation increase the risk of cancer and immune systems damage in people and can cause mutations during the early life stages of fish and amphibians.

The adverse impacts from climate change will be magnified by other environmental effects now pummeling the Arctic, such as long-range chemical pollution, overfishing, population growth, changes in land use and habitat fragmentation.

In many cases, warns the report, the total impact is greater than the sum of its parts.

The scientific assessment is already being cited by the indigenous peoples groups to buttress their long-standing concerns about the threats to their lifestyle and culture caused by the burning of fossil fuels in cities far from the Arctic.

And the Bush administration is also already objecting to the timetable for the policy recommendations, a move seen by other observers as another instance of U.S. foot-dragging on climate change.

But the real test for the Arctic Climate Impact Assessment will be whether it suffers the same fate as the regular jeremiads about global

climate from the Intergovernmental Panel on Climate Change. The IPCC's pronouncements grab headlines and produce promises of action from governments but so far the upshot has been only the ill-fated Kyoto Protocol.

Yet the IPCC case continues to strengthen scientifically.

A workshop in Paris last month of the world's top climate modellers came the closest yet to consensus on what's known as climate sensitivity — how much the average global temperature will rise with a doubling in atmospheric carbon dioxide.

For decades the best that modellers could manage was a range from 1.5 degrees to 4.5 degrees Celsius.

But now most climate modellers are zeroing in on 3 degrees as the most probable climate sensitivity.

If they're right, then the comparable increases in Arctic average temperatures would be at least 6 degrees before the end of this century, even if Kyoto went into effect.

This last brush stroke creates a much darker picture for the impact of climate change on the Arctic.

Additional articles by Peter Calamai

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