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Water cycle instability is here to stay posing major political and economic risks

Adaptation to new risks: A vital necessity for development policies

Date: April 4, 2016

Source: United Nations University

Summary: The current instability and unpredictability of the world water cycle is here to stay, making society's adaptation to new risks a vital necessity when formulating development policies, a UN expert warns. He says long-term water cycle stability 'won't return in the lifetime of anyone alive today.'

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The current instability and unpredictability of the world water cycle is here to stay, making society's adaptation to new risks a vital necessity when formulating development policies, a UN water expert warns.

Robert Sandford, the EPCOR Chair for Water and Climate Security at the United Nations University's Canadian-based Institute for Water, Environment and Health (UNU-INWEH), says long-term water cycle stability "won't return in the lifetime of anyone alive today."

"What we haven't understood until now is the extent to which the fundamental stability of our political structures and global economy are predicated on relative stability and predictability of the water cycle -- that is, how much water becomes available in what part of the year. As a result of these new water-climate patterns, political stability and the stability of economies in most regions of the world are now at risk."

Ontario Lieutenant-Governor Elizabeth Dowdeswell, a former Executive Director of the UN Environment Programme, and UN Under Secretary-General David Malone, Rector of UN University, are among several expert speakers joining Sandford in Ottawa Tuesday April 5 at UNU-INWEH's day-long 20th anniversary public seminar, "Water: The Nexus of Sustainable Development and Climate Change."

The seminar will focus on national policy changes needed worldwide to achieve global water security -- a pre-requisite for reaching the new global Sustainable Development Goals, or SDGs, agreed upon by world leaders in September 2015.

"Water is the most precious and increasingly scarce resource of many developing countries, including several of the largest among them," says Dr. Malone. "Their growing populations can't do without it, indeed need more of it all the time, while climate change has made supply even more unpredictable and unreliable than in the past. The issue of water supply and quality is existential for much of the developing world, and touches on most of the Sustainable Development Goals agreed last year at the UN."

Commented Ms. Dowdeswell: "Canada has contributed an impressive number of ideas and individuals to the resolution of global environmental challenges. UNU-INWEH continues to mobilize thought leaders to turn ideals and agreements into action. Our common vulnerability must be met with courage and boldness."

"Our research," adds Zafar Adeel, Director of UNU-INWEH, "shows that achieving the water-related SDGs represents an expeditious and cost effective way to arrive at sustainable development and societies that are resilient to climate change impacts."

Blown the fuse?

"Rising mean temperatures have begun to change a vast array of visible and invisible parameters that define the very foundation of the world as we know it," says Sandford.

"For generations, global water cycle stationarity has allowed us to confidently predict and manage the effects of weather and climate on our energy systems, cities and food systems. Engineers and others working in construction and development planning also rely on this predictability to define infrastructure safety standards."

"Its loss -- and the consequences of extreme droughts and floods that result -- require us to anticipate profound adjustments to the way we do business over the coming decades, and to make adaptation central to global policy making. This new focus on adaptation will transform policy, political, economic and social systems."

"It is a very real fear among experts," Sandford says, "that we have blown the natural systems fuse that controls planetary land and sea-surface temperatures -- that we are now likely passing over an invisible threshold into a new global hydro-climatic state. In other words, climate change may have already gotten away on us."

Human migration associated in part with climate change is one of the major shifts already underway, with enormous political, economic and social implications.

By one estimate, for example, 3.5 million middle class citizens have left drought stricken California since 1993, in part because of water restrictions and increasing property damage due to wildfires. They are being replaced by large numbers of Latin American citizens, themselves fleeing a range of challenges.

"Yet we are witnessing only the tip of the iceberg," says Sandford.

The water / food / energy / climate change nexus

Sandford, also senior water advisor to the Interaction Council, an association of over 30 former world leaders chaired by former Canadian Prime Minister Jean Chretien, says water, food, energy and climate "form a nexus -- a change in any one part of the nexus affects all the others and compounds the effects."

"Our ability to feed growing populations, reduce poverty and sustain prosperity will depend on a greater realization and appreciation of the important interconnected nexus formed by water, climate, food and energy -- managing them as a whole, not as separate elements unrelated to one another."

Adds Sandford, "we now have to start thinking the unthinkable: that extreme events might reverse development, even here in North America. In fact, climate related de-development is already happening in Canada; we just don't see it that way yet."

Figures from the Insurance Bureau of Canada, for example, show the costs of storm-related disaster relief averaged \$36 million dollars annually in the 1970s but now amount to over \$1 billion a year.

These numbers partly reflect aging infrastructure across the country, says Sandford, but they also reveal more frequent and intense flood events. In many cases, infrastructure is sound but not designed to handle the new intensity of storms.

The projected lengthening of the growing season will allow northern expansion of warm weather crops, as long as soil and water conditions are suitable and supporting infrastructure can be developed economically.

On the other hand, climate change is affecting regions from which Canada imports its foods, meaning the country must increase local production to compensate and achieve future food security.

At higher altitudes, such as in the Canadian Rockies, the glaciers that provide critical flows in summer months are expected largely to disappear before the end of the century. Winter snowfall will be replaced gradually by rains flowing through reservoirs in spring, leaving much less water for the critical food-producing summer months. Conflicts will arise between those who wish to retain water flows in rivers streams for food fish and those who wish to exploit flows to irrigate crops.

The hydrologic changes will also affect electricity generation by hydro dams and energy production might be reduced in mid to late summer, the very time when power demands for air-conditioning and for pumping both surface and groundwater are at their highest.

World policy options

Sustainable Development Goal 6 relates specifically to water: Achieve universal and equitable access to safe and affordable water and sanitation, and improve water quality by reducing pollution, halving the portion of untreated wastewater and substantially increasing recycling and safe reuse."

"Timing is critical. We must act urgently to implement the SDGs," says Adeel, noting that the Paris Agreement in December 2015 starts to provide necessary policy tools and financial resources.

"If we don't regain momentum in achieving water goals," says Adeel, "we face stalled or even reversed development, more people in poverty and greater national insecurity with the potential to create more international tension and conflict."

Among a large suite of policy options relevant worldwide:

- End subsidies that produce cheap fossil fuels and provide low-cost water, leading to enhanced conservation
- Regulations for the oil and gas industry, some form of financial levy on carbon emissions, and further development of carbon capture and sequestration technology
- Reduce food waste (estimated at up to 50% in Canada), which squanders huge volumes of water and energy used to produce it in the first place
- Astute soil conservation, which worldwide could sequester billions of tons of carbon out of the atmosphere into Earth's soils, reducing atmospheric carbon dioxide concentrations by an estimated 3 ppm each year
- Review floodplains and the security of buildings in them
- Accelerate the restoration of natural wetlands
- Build a better bridge between science and public policy

Story Source:

The above post is reprinted from materials provided by **United Nations University**. *Note: Materials may be edited for content and length.*

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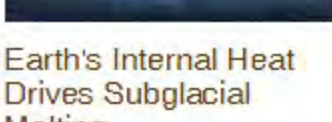
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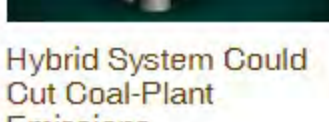
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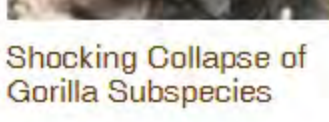
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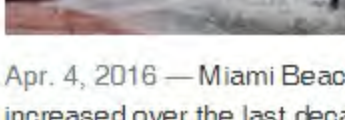
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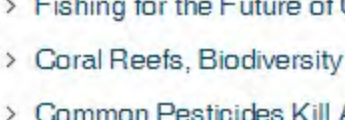
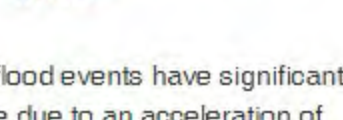
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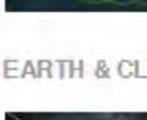
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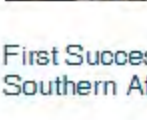
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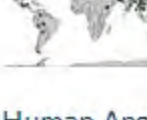
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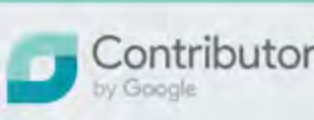
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