

Press release issued by the International Geosphere-Biosphere Programme on behalf of the International Nitrogen Initiative, the Scientific Committee on Problems of the Environment (SCOPE) and the Centre for Ecology & Hydrology

IMMEDIATE RELEASE

SCIENTISTS AT CLIMATE TALKS SAY MAJOR CHANGES TO THE NITROGEN CYCLE CANNOT BE IGNORED

**“The nitrogen cycle is changing faster than that of any other element.” United Nations Environment Programme.**

An international group of scientists say there is an immediate need for a global assessment of the nitrogen cycle and its impact on climate.

On a planetary scale, human activities, especially fertiliser application, have more than doubled the amount of reactive nitrogen in circulation. This massive alteration of the nitrogen cycle affects climate, food security, energy security, human health and ecosystem health. The long-term consequences of these changes are yet to be fully realised, but the human impact on the nitrogen cycle has so far been largely missed in international environmental assessments.

Nitrogen's role in climate change will be highlighted at an event on 7 December at the COP-15 United Nations Climate Change Conference in Copenhagen. Event organisers will be calling for a new assessment of nitrogen and climate, which will identify innovative nitrogen management strategies for global climate change mitigation and associated co-benefits to society.

Dr Cheryl Palm, the chair of the International Nitrogen Initiative, which is organising the event, said “Nitrogen and climate interactions are not yet adequately included in the Intergovernmental Panel on Climate Change assessment process. There is an urgent need to assess the possibilities of nitrogen management for climate abatement and at the same time increase food security, while minimising environmental and human health impacts.”

Dr Palm added, “We believe that in tackling nitrogen new opportunities for climate abatement will be created.”

Professor Jan Willem Erisman from the Energy Research Centre of the Netherlands, who will speak at the event said: “An internationally-coordinated global nitrogen assessment is urgently required. A special report on nitrogen and climate is the natural first step”.

Kilaparti Ramakrishna, Senior Advisor on Environmental Law and Conventions at UNEP who will give the opening address at the side event said, “The nitrogen cycle is changing faster than that of any other element. In addition, the effects of reactive nitrogen are not limited to a single medium. A single molecule of reactive nitrogen may transition through many forms - ammonia, nitrogen oxide, nitric acid, nitrate and organic nitrogen – and may successively lead to a number of environmental, health and social impacts, including contributing to higher levels of ozone in the lower atmosphere. Over the last decade a number of global, regional and national initiatives have identified and addressed the issue of nutrient enrichment to the coastal zone. However, programmes are dispersed and fragmented and there is no single place to go for an overview of available information tools and mechanisms.”

The INI team believes that it is essential to untangle the complexity of the nitrogen and carbon cycle, identify the advantages of nitrogen management for climate abatement and investigate the costs and barriers to be overcome. Such an assessment needs to distinguish between developed areas where there is already an excess of nitrogen and the developing parts of the world where nitrogen management can help increase food security. Improved Nitrogen management will help limit fertilizer use, increase its efficiency and increase carbon sequestration in soils, decrease N<sub>2</sub>O emissions, while limiting other environmental and human health impacts.

The side event "Options for Including Nitrogen Management in Climate Policy Development" will be held in the US centre (Hall C5) from 6pm local time. The event will be followed by a networking reception supported by the Centre for Ecology & Hydrology (CEH), United Kingdom The organisers of

the side event are the INI, CEH, the Ministry of Housing and Spatial Planning and Environment (VROM) of The Netherlands, the United Nations Environment Programme - Global Partnership on Nutrient Management (UNEP/GPNM), the David and Lucile Packard Foundation, SCOPE, the International Geosphere-Biosphere Programme, COST and the European Science Foundation Nitrogen in Europe Research Networking Programme (NinE-ESF).

### **Supporting quotes**

Professor Pat Nuttall, Centre for Ecology & Hydrology, UK and Chair of the Partnership for European Environmental Research (PEER), said, "The message to our leaders in Copenhagen is that we must develop more joined up approaches. We must recognize the importance of both carbon and nitrogen cycles and learn to manage their interactions. This will be even more important in future as projected rates of reactive nitrogen production increase, putting even more pressure on nitrogen saturated regions of the world, with uncertain climate consequences."

Dr Mark Sutton, Centre for Ecology & Hydrology, UK, Director of the European Centre of INI, and Co-Chair of the UN-ECE Task Force on Reactive Nitrogen, which is currently completing the first European Nitrogen Assessment (ENA), said, "Nitrogen is causing a web of interactions that affects all global change threats. In the ENA we have made the first steps to linking these issues. The next stage must be a global nitrogen assessment that addresses each of the climate, pollution and biodiversity challenges. "

Alan Townsend, University of Colorado, and Director of the North American Centre of INI, said, "A comprehensive assessment of how the global nitrogen cycle is changing, what the consequences are for human well being and the environment, and what our options may be for more efficient use of nitrogen, is essential for developing a more sustainable relationship between people and a resource on which we all depend."

Eric Davidson, Woods Hole Research Centre, who will speak at the INI event, said, "It will not be possible to understand biotic feedbacks to climate change without including linkages between carbon and nitrogen cycling in terrestrial and aquatic ecosystems. Whether forests, soils, and sediments gain or lose carbon in a warmer world with more CO<sub>2</sub> will depend largely on the nitrogen cycles of those ecosystems."

INI is a scientifically independent global organisation of scientists linked to the Scientific Committee on Problems of the Environment (SCOPE) and the International Geosphere-Biosphere Programme (IGBP) with regional centres in five continents.

### Editors notes

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The nitrogen side event at COP-15 has been organised by the International Nitrogen Initiative and the UK's Centre for Ecology & Hydrology. It will take place on 7 December from 18.00 to 20.00 at the U.S.

Center, Hall C5, Bella Centre, Copenhagen.

Many of the scientists quoted above are involved in United Nations processes to manage nitrogen in agriculture more effectively so environmental threats such as climate change and biodiversity loss can be reduced.

The INI is a joint project of the IGBP and SCOPE. [www.initrogen.org](http://www.initrogen.org).

### **International Geosphere-Biosphere Programme**

The International Council for Science (ICSU) formed the International Geosphere-Biosphere Programme (IGBP) in 1987 in recognition that climate change is one part of a much larger challenge: global change. IGBP's vision is to provide scientific knowledge to improve the sustainability of the living Earth. IGBP involves researchers from 74 nations and is based at the Royal Swedish Academy of Sciences in Stockholm. IGBP is a co-sponsor of the International Nitrogen Initiative. Professor Jan Willem Erisman from INI is on the IGBP Scientific Committee. [www.igbp.net](http://www.igbp.net)

The Scientific Committee on Problems of the Environment (SCOPE) is the scientific committee on problems of the environment, a body of the International Council of Scientific Unions

The Ministry of Housing and Spatial Planning and Environment (VROM) of The Netherlands is a government Department.

The United Nations Environment Programme - Global Partnership on Nutrient Management (UNEP/GPNM) is a new initiative established under the Commission on Sustainable Development.

The David and Lucile Packard Foundation is a charitable foundation.

The Nitrogen in Europe (NinE) programme of the European Science Foundation addresses the links between nine environmental threats related to nitrogen: aquatic, coastal and terrestrial eutrophication, acidification, stratospheric ozone depletion, climate change, photochemical ozone pollution, urban air quality and particulate matter in the atmosphere. With the Task Force on Reactive Nitrogen, the NinE programme is currently preparing the first European Nitrogen Assessment report, for publication during 2011. The Task Force on Reactive Nitrogen (TFRN) is a body under the UN-ECE Convention on Long Range Transboundary Air Pollution

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