Dear Colleagues,

I hope this finds you and your loved ones safe and well at this difficult time. I think Covid-19 has surprised us all at how much it has disrupted the lifestyle we had become so accustomed to.

There seems to be winners and losers in all aspects of life and for the environment as well, with reduced human activity meaning that bird song came into the foreground for the first time in decades, accompanied by clean air and water benefits for many.
This issue shows how the literature is starting to report how Covid-19 interacts with nitrogen in the environment as well, for example, nitrogen dioxide levels as a contributing factor to coronavirus fatalities (Ogen, 2020), levels of some air pollutants are linked to COVID-19 cases and adverse outcomes (Travaglio et al. 2020) and there has been amplified ozone pollution in cities during the COVID-19 lockdown (Sicard et al. 2020). The research community has also been affected by the restrictions on travel, no more so than our own with postponement until 2021 of INI’s 8th Global Nitrogen Conference that was scheduled to be held in Berlin, Germany, in May this year. We report on the holding of the successful virtual curtain raiser event on the internet on 4th May, complete with a poster session. We also feature a paper featuring the efforts of previous INI global conferences in cutting the nitrogen footprint of meetings and how there is now a Cercedilla Manifesto to promote more sustainable meetings in the future.

Our main feature in this issue returns to a key nitrogen issue for Europe that continues to play out in the Netherlands right now, which brings into sharp focus the relationship between nature and the economy through the lens of nitrogen or Stikstof as it is known in the Netherlands. We have an interview with Dr Albert Bleeker of RIVM on how Netherlands is struggling to control excess nitrogen in the environment. This interview was conducted by a new member to our team, SEI’s internet roving communications specialist, Frances Dixon, a warm welcome to her.

We hope you enjoy this addition and our usual mixture of features, news, publications and forthcoming meetings in the nitrogen world. And, we wish you good health and look forward to meeting up again in a world where the threat of Covid-19 is reduced and perhaps we may have learnt new ways of doing things for the common good.

Please keep your contributions and feedback coming and here’s wishing you all a fantastic Autumn.

Best wishes

Kevin

Dr Kevin Hicks (INI Europe Centre Director)
Q: What is the problem with nitrogen in the Netherlands?

A: Well, first it's important to make a distinction between the different nitrogen issues. We have nitrogen pollution from agriculture and the combustion of fuels in industry and transport. This causes different issues of concern, for example, excess nitrogen in ground and surface water and excess nitrogen in the air (as particles or as gases) can impact on human health.

Then we have excess emissions of ammonia from agriculture, leading to nitrogen deposition. The biggest issue we are facing in the Netherlands at the moment, is the damage that nitrogen deposition is causing to nature areas in the context of the EU Habitats Directive.

Q: What is happening with the EU Habitats Directive?

A: Last year, on 29 May 2019, following an earlier ruling from the European Court of Justice (ECJ), the Dutch Council of State ruled that the way the Netherlands has implemented the Habitats Directive and its approach, did not meet the legal requirements of the Directive. That meant the whole system that had been built up since 2015 to manage nitrogen, including the issuing of permits for activities that emit nitrogen, became invalid. The permits had to be taken back. This has led to all kinds of trouble.

Q: What was the impact of this?

A: All new activities including farming, the building of houses and roads - everything that caused nitrogen emissions and deposition since 2015 - more or less, became illegal. In many cases this related to agriculture, especially here in the Netherlands, where nearly half of nitrogen deposition originates from Dutch agricultural activities.

Q: How did the Government respond?

A: Well obviously the Ministers had to take action to address the issue. They implemented measures to address the concerns of the ECJ. One of the biggest issues was how the Netherlands had interpreted the Habitats Directive. Anticipating a national downward trend in total nitrogen emissions allowed new nitrogen emitting activities to take place. But, the problem is, you can't be sure that the nitrogen emissions will go down - the Dutch Council of State
is, you can’t be sure that the nitrogen emissions will go down — the Dutch Council of State decreed that there should be proof with scientific confidence that nitrogen emissions would indeed decrease. Until a reduction in nitrogen emissions could be proved, all nitrogen producing industries had to pause and ways had to be found to allow economic activity related to nitrogen emissions to proceed.

Q: What did this mean for the economy?

A: The building of houses for instance, was not possible, because it would produce additional nitrogen. A measure was even introduced to bring the motorway speed down from 130km to 100km. The nitrogen saved through this enables the building of 75,000 houses in the Netherlands.

Q: It sounds like the motorway measure was quite effective?

A: Well, in total we need another 750,000 houses, so we have a long way to go. On average, there has only been a reduction in nitrogen deposition of about 1.2 moles (14 grams) per hectare, per year. But in the Netherlands we currently have an average of about 1600 moles of nitrogen per hectare, per year. In order to prevent exceeding the critical load, we need an additional reduction of 600 moles per hectare, per year, to reach this. And this is just on average!

The problem is, there needs to be no exceedance of the critical loads of nitrogen deposition across the whole Natura 2000 area of protected sites in the Netherlands, under the Habitats Directive. But even if it were possible to have zero emissions in the Netherlands, you would still get exceedance caused by nitrogen pollution from other countries. That is a big challenge.

Q: What other measures were put in place?

A: Ministers from relevant departments introduced a list of measures to reduce nitrogen emissions, to provide another means of building houses and other activities. One of the measures for agriculture was buying up the production rights of about 400 pig farms and taking them out of production. This is a voluntary measure and there is €350 million to compensate the sector, so this measure has not been so controversial.

But there is another measure, to reduce the amount of protein in dairy feed, which is compulsory. Like for the pig farms, farmers want this on a voluntary basis, which is not possible as there needs to be certainty in emission reductions, to comply with the Habitats Directive. Farmers argue that low protein can damage animal welfare and their livelihoods.

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Q: This has not been received well by the agriculture sector and has led to protests. Can you tell us more?

A: There are different sentiments leading towards the demonstrations taking place now. The
The agriculture sector has the feeling that they have been made responsible for solving the problems for the rest of the Netherlands. They have to implement measures to reduce nitrogen, so that other sectors, like the building of housing and roads, can continue. In addition, their view is that the reduction in nitrogen emissions from agriculture should be put back into developing the agricultural sector.

The sector has also contested the validity of RIVMs data, which shows the agriculture sector contributes to 46% of nitrogen deposition. The effect on nitrogen deposition of reducing the amount of protein allowed in feed has also been estimated by RIVM, and so this has become another contentious issue, causing demonstrations to be targeted at RIVM.

Because of the dispute over how nitrogen emissions and deposition are estimated, the Ministry of Agricultural established an expert committee to assess the computation of nitrogen fluxes in the Netherlands. This showed RIVM’s numbers are valid. But, because the report also said the estimates could be improved, the numbers are still disputed and there is still a feeling that farmers are being treated unfairly. So, there is an issue around communication too.

Q: So, how do you think the future looks for the Netherlands?

A: As I said before, this is a European wide problem, as nitrogen emissions from one country can be transported in the air and deposited on neighbouring countries. The Netherlands receives about 30% of its nitrogen pollution from outside its borders, so the ultimate solution has to take this into account. This problem is at the heart of regional cooperation under the Convention on Long-Range Transboundary Air Pollution signed in 1979 and the EU National Emission Ceilings Directive, where countries are required to cap their emissions.

In the end, it comes down to a question of nature versus economy. Looking out to 2050, we need to think carefully how to solve this puzzle, if we are to protect nature effectively. For me, the solution has to show that there is something in it for everyone and that certain sectors need to feel that they are not being unfairly burdened with protecting the common good.

The role of RIVM’s in monitoring Nitrogen.

The Dutch National Institute for Public Health and the Environment (RIVM) is responsible for continuously monitoring concentrations of nitrogen oxides and ammonia in the air and precipitation. Together with site managers, RIVM also monitors the ammonia concentration in more than 80 nature reserves. In addition to the concentration, they also measure the emission and deposition of ammonia, using various measuring systems. Model calculations are carried out to explain the measured levels of ammonia and to map the nitrogen deposition in nature.

Based on this data, RIVM provides the Dutch Ministry of Infrastructure and Water Management and the Ministry of Agriculture, Nature and Food Quality with advice and information on nitrogen deposition.

RIVM also develops and manages the set of instruments called AERIUS, that can be used by permit issuers to calculate the emission and deposition of nitrogen on Natura 2000 sites. For more information, visit the AERIUS website.

Feature

The future of research meetings?

The impact that COVID-19 has had on physical attendance at meetings has demonstrated that significant time, cost savings and importantly lower emissions can be achieved using video-conferencing and interactive platforms such as Zoom, TEAMS, GotoMeeting and Google Hangouts. Post COVID-19, there might possibly be a gradual return to physical meetings but,
even so, the opportunity exists for them to become more sustainable.

A recent article in *Nature Food* (Sanz-Cobena, et al 2020) has proposed how scientific meetings could be organised in the future by considering the impacts from a consumption and production perspective, including prioritising plant-based meals in order to reduce nitrogen loss. This has evolved into the call for the Cercedilla Manifesto to be adopted through a European wide petition. [Follow this link to read petition.](https://twitter.com/SanzCobena/status/1251170226131087360?s=20)

The manifesto proposed by Adrian Leip, of the European Commission’s, Joint Research Centre (JRC) sets out a checklist for sustainable meetings (see figure above - click for higher resolution version). It provides options to consider for both organisers and attendees:

**Organisers** should consider whether a physical meeting is actually necessary or if remote participation is available, which in turn could possibly open up attendance to a wider and more inclusive audience. The location of a physical meeting is important in terms of accessibility, e.g. distance from major transport hubs and availability of low-emission transport services for transport to and from the venue. The choice of venues should consider energy, water, food sources and waste management.

**Attendees** should assess whether their attendance is necessary and if they could participate remotely. If they attend, what is their own personal contribution towards reducing energy and resources use including their selection of travel and accommodation.

Read the article:


Related Tweets from Alberto:


Here are some examples of events held during lockdown:
Cool Farm Alliance (CFA) - Annual Meeting 2nd April 2020

The CFA 2020 Annual Meeting, took place virtually with 470 attendees joining online to hear about members’ activities and projects designed to deliver more sustainable agriculture at scale.

Watch the webinar recording on YouTube.

The Cool Farm Alliance is a global community of organizations working together to develop and promote a harmonized set of metrics for agricultural sustainability. Membership consists of food retailers, manufacturers, input suppliers, service providers, NGOs, universities and consultancies. Its online Cool Farm Tool has over 10,000 users.

International Nitrogen Initiative (INI) Global Conference INI2020

The conference was due to be held in Berlin however, due to COVID-19 a curtain raiser event for 2021 was held online.

Watch the conference video

Keynote Presentations (PDF)

- Prof. Xin Zhang (University of Maryland, USA) on “The current state of nitrogen around the world”
- Prof. Mark Sutton (Center for Ecology and Hydrology, UK) on “International policy developments on nitrogen”

Read the summary of the key conference speeches (pdfs)

View the Virtual Poster Session

News

Prestigious award for Dutch Nitrogen expert
Congratulations, on behalf of INI Europe, to Professor Wim de Vries who has been nominated for the prestigious 2020 Huibregtsen award for his work on “integral analyses of nitrogen effects for an effective policy”. The jury paid recognition to his ‘outstanding work, through which he positions the Netherlands distinctively on the international stage.’

Professor de Vries is professor in the discipline of environmental systems analysis at Wageningen University. His chair focuses on “Integrated nitrogen impact analysis” but his research domain is broader than nitrogen alone.

The Huibregtsen prize is a prestigious one and is awarded only to research that combines scientific excellence and innovation. In addition, the research project must demonstrate exceptional societal value and outreach, above and beyond what might be expected of a researcher in this position.

**Agronomy Journal. Call for papers.**

Special Issue will focus on “Innovation in Green Manure Management in Field Crop Systems.”

The journal welcomes novel research, reviews, and opinion pieces covering all related topics including the different types of green manure, nutrient management in conventional and organic crop production, N and P cycling, soil fertility, diseases and weed control, innovative solutions, modelling, case-studies and policy positions.

The editor for this special issue is: Prof. Claudia M d S Cordovil (School of Agriculture, University of Lisbon, CEF, Portugal). Further details for authors are available by registering and logging in to the website ([www.mdpi.com](http://www.mdpi.com)).

Deadline for manuscript submissions: 10 November 2021.
Kevin Hicks, INI Europe Director contributed to the July issue of Air Quality News newsletter talking about the importance of Nitrogen. In the article, “The crucial link between air pollution and biodiversity loss”, he highlighted the importance of ammonia emissions that come from agriculture, through the spreading of manures, slurries and fertilisers.

Kevin explained: ‘Let’s say you have a pig; the pig produces manure, which produces ammonia. That ammonia can then go straight up in the air and damage the woodland next door.

‘Or the ammonia could go up into the atmosphere and be reduced to an ammonium ion, it could then combine with some oxidised nitrogen from the back of a car and form ammonium nitrate, and that could fall onto a bog and cause a competition effect between the plants there.

‘That same molecule could then leave the ecosystem through a stream, and it could travel right down into the sea, causing ocean dead-zones, and from there it can be transformed back into nitrogen and go back into the atmosphere ready to start again.’

Read the full article here.
International Nitrogen Management System (INMS) report to be published.

The International Nitrogen Management System (INMS) has finalised a report entitled “Global-scale modelling of flows and impacts of nitrogen use: modelling approaches, linkages and scenarios” to be published as the first official INMS report. It sets out the approach to a global integrated nitrogen assessment model chain which allows the evaluation of the consequences of different socio-economic drivers (scenarios) and N mitigation management, in terms of: (i) benefits, including food, feed, fibre (wood) and energy production and (ii) threats, including pollutant and greenhouse gas emissions, affecting the quality of air, soil and water and related climate, human health and biodiversity impacts.

The document is currently under review EC Long-range Transport of Air Pollution (LRTAP) Task Force on Reactive Nitrogen (TFRN) Integrated Assessment document going to Working Group on Strategies and Review (WGSR) before being published

http://www.clrtap-tfrn.org/

Publications

Covid-19 related


Impacts of nitrogen fertilization on soil acidification


Impacts of nitrogen fertilization on the exchange of greenhouse gases


Modelling impacts of nitrogen inputs and required changes in nitrogen use efficiencies


Other


Infographic

Interesting data visualisation from Information Is Beautiful website showing the global sources of methane. Data is taken from Global Carbon Project, NASA and Climate and Clean Air Coalition. Click the image to see the full version.

Read how nitrogen links to methane on the LRTAP website.
Animation

Check out this great animation from Deutsche Umwelthilfe - *From nutrient to environmental issue – why less nitrogen in our environment can solve many problems*.

[Image of the animation]

Data Protection Notice

You may have noticed that the INI Alert newsletter is now provided through a different service. Instead of Mailchimp, it is sent using Mailjet. We have transferred your contact details used for the newsletter to this system and have removed them from Mailchimp. The terms of holding your data are exactly the same. We will only use your email address for sending out the newsletter and will not pass on details to a third party. This data is stored on the Mailjet servers in Europe (read here for further details).

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