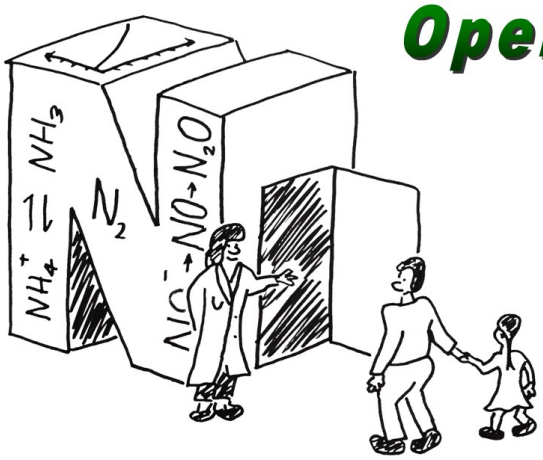

Opening Nitrogen Science to the People

Madrid, Spain, 6-10 Oct 2008

EUROPEAN SCIENCE FOUNDATION
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Abstract

Currently public awareness and involvement in the science linking different forms of nitrogen and their effects on the environment is low. To improve this situation a workshop for 25 scientists to develop tools and methods to engage the public with current nitrogen science was organised through the NitroEurope Young Scientists' Forum. This workshop took place in Madrid in October 2008 over five days and consisted of invited speakers, group work and relevant excursions.

Workshop Objectives

- An increase in the participants' understanding of effective methods to engage the public with scientific research;
- A discussion of how these methods could be applied to nitrogen research and whether certain techniques would succeed or fail. This discussion should also give rise to novel methods of public engagement that can be developed further;
- The group work will produce 'prototype' tools and techniques for various target audiences, which can be refined following the workshop. These are referred to as prototypes in the acknowledgement that resources (both time and materials) will be limited during the event. These prototypes will be reported to the group in the plenary session to get feedback in the ideas presented. It is expected that the ideas presented will be further developed and applied following the workshop;
- An increase in the participants' understanding of practical applications of science communication through the excursions on Day 5.
- A workshop report will be produced following the event giving details of the discussions and the ideas developed during the event. The experiences of the participants and the tools and techniques that are developed can also be presented at relevant forums

Workshop Summary

Day 1:

- Workshop inauguration by the vice-rectorate of the Technical University of Madrid and the General Secretary of the Spanish Ministry of Science and Innovation
- Presentation by Mark Theobald “Nitrogen Science and the Communication Challenge”
- Invited speakers with background in science communication (contributions from British Association for the Advancement of Science, CarboSchools, Science&Media, Schwäbisch Gmünd University of Education and the Energy Research Centre of the Netherlands)

Day 2:

- Audience targeting - How can we engage different audiences? (Discussion)
    - A long list of potential audiences was produced and discussed but this list was distilled into 3 target groups:
        - Interested adults
        - Education (teachers, schoolchildren)
        - Policy makers, NGOs
    - Different key messages were discussed for each target group. The key messages were:
        - What is Nitrogen
        - Nitrogen is important to everyone
        - We need nitrogen but…
        - Good/Bad nitrogen
        - Eat less meat, it’s healthier
        - Healthcare costs would be lower
        - Nitrogen need to be managed in an integrated way
        - Could save farmers money

- Potential project ideas (Brainstorming)
    - In addition to the potential projects suggested prior to the workshop, each participant was encouraged to write down their ideas and read them out to the group. This resulted in a list of about 30 projects. These projects were then grouped into themes to make it easier for the attendees to decide which group they would like to work with. The chosen themes were:
        1. Website explaining nitrogen science
        2. Information/activities to raise awareness and discuss the issues with policy makers, NGOs etc.
        3. Activities for a “Nitrogen-day”
        4. Films/Adverts/Books/Comics etc.
        5. School activities (ages 7-11)
        6. School activities (ages 11-16)
        7. Nitrogen at home (information/activities for shopping centres, supermarkets, hospitals etc)

Group projects

Attendees grouped themselves into these themes. Theme 3 (Activities for a "Nitrogen-day") was not chosen by anybody. The remaining time was devoted to working on these themes and presenting them to plenary on the afternoon of Day 4.

Theme 1: Website explaining nitrogen science

The aim of the group was to design a website as a first point of call for the public for information on nitrogen, its effects and possible solutions. The website design contains three sections:

1) General information (What is nitrogen?, N-cycle, environmental impacts, solutions, FAQs etc)
2) Information on current nitrogen research (links to project web sites, scientific abstracts in 'normal' language etc.)
3) Nitrogen communication platform (containing information on science communication strategies and a restricted area for the development of communication strategies)

Preliminary URL: www.nitrogen&thepeople.org

Theme 2: Information/activities for policy makers, NGOs etc.

The aim of the group was to develop information (flyers, presentations etc) that could attract the attention of policy makers and NGOs. The outputs of this group were:

1) A draft leaflet entitled "The World's Nitrogen Challenge" highlighting the rise of nitrogen related problems and promoting the research into the issues (with references to NitroEurope, INI, ESF-Nine etc.
2) A dramatic presentation showing the environmental impacts of nitrogen and what's causing them. This presentation highlights the role that excess food production has on the nitrogen cycle and the benefits of lower meat consumption. The group also highlighted the need to find a fashionable role-model to lead a campaign.

Theme 4: Films/Adverts/Books/Comics etc.

This group looked at how to raise awareness of the issues through attention grabbing media. The main output of the group was two short films highlighting the dangers too much reactive nitrogen. The first film showed images of the environmental impacts to the soundtrack of "Live and let Die", whilst the second film also highlighted the dangers but in a more light-hearted 'burlesque' style.

Theme 5: School activities (ages 7-11)

The approach taken by the group to inform and educate young school children about the issues was to develop personalities around each form of nitrogen. For example nitrogen gas was portrayed as very sensible and a bit boring, whilst ammonia was a smelly character who lived on a farm and was sometimes good (helped to grow crops) and sometimes bad (made some plants disappear). The characters were introduced in a short video and then the idea was followed through to a group therapy session where the different forms of nitrogen were seeking solutions to their own (environmental) problems. As an introduction to the project, a short poem about nitrogen was written. The project has

also been adapted for use as a museum exhibition for children. A 'bagatelle' demonstration was also developed which simulates the fate of nitrogen fertiliser by a cascade a balls. Some of the 'nitrogen balls' end up in the food or back in the atmosphere as nitrogen gas but the majority end up as ammonia, nitrous oxide or nitrate. This demonstration could be developed into a nitrogen pinball game where the objective is to get as many balls in the 'food' or 'nitrogen gas' targets.

Theme 6: School activities (ages 11-16)

The group aiming at slightly older children developed a lesson programme introducing each form of nitrogen a lesson at a time. During each lesson simple experiments are conducted on the chosen form of nitrogen along with games and information on the environmental impacts. In addition to the classroom activities a wall chart was developed which builds up the nitrogen cycle stage by stage as the children learn about the different forms. An outdoor game was also developed where the children hunt for the different forms of nitrogen in the forest. This is designed to teach the children where the different forms of nitrogen can be found (e.g. in the air, soil, plants etc).

Theme 7: Nitrogen at home

The aim of the group was to reach households in order to:

1) Reduce nitrogen emissions without compromising life quality
2) Improving life quality in a sustainable manner

To do this the group designed a range of resources to educate and entertain. These resources ranged from rulers/screensavers/posters highlighting the nitrogen cycle, through a fun nitrogen cycle for children, a board game based on the nitrogen cycle and even a nitrogen 'rap' song.

Future development

Following the group presentations, action plans were devised to develop these prototype ideas.

Date	Action
As soon as possible	Find a host for the website and put videos on Youtube
January 2009	Showcase the results of the workshop at the Gothenburg NitroEurope annual meeting
2010	Follow-up workshop with feedback from tested ideas and invited public
2011	The launch of the European Nitrogen Assessment. This could be combined with a 'European day of Nitrogen' for example, with various events being held throughout the member states.