



European Nitrogen Assessment

Introduction

Mark Sutton



ENA-1 Wageningen
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What's the big idea?

- Human produced reactive nitrogen a hidden force having multiple effects on society
- Without it half the world's population would not be alive
- Nitrogen leading to a web of environmental effects with many synergies and trade offs.
- We need to understand the system better to develop more integrated solutions.

Global Nr and the International Nitrogen Initiative (INI)

Human Nr Production:

(Tg yr⁻¹)

1860: 15

1995: 156

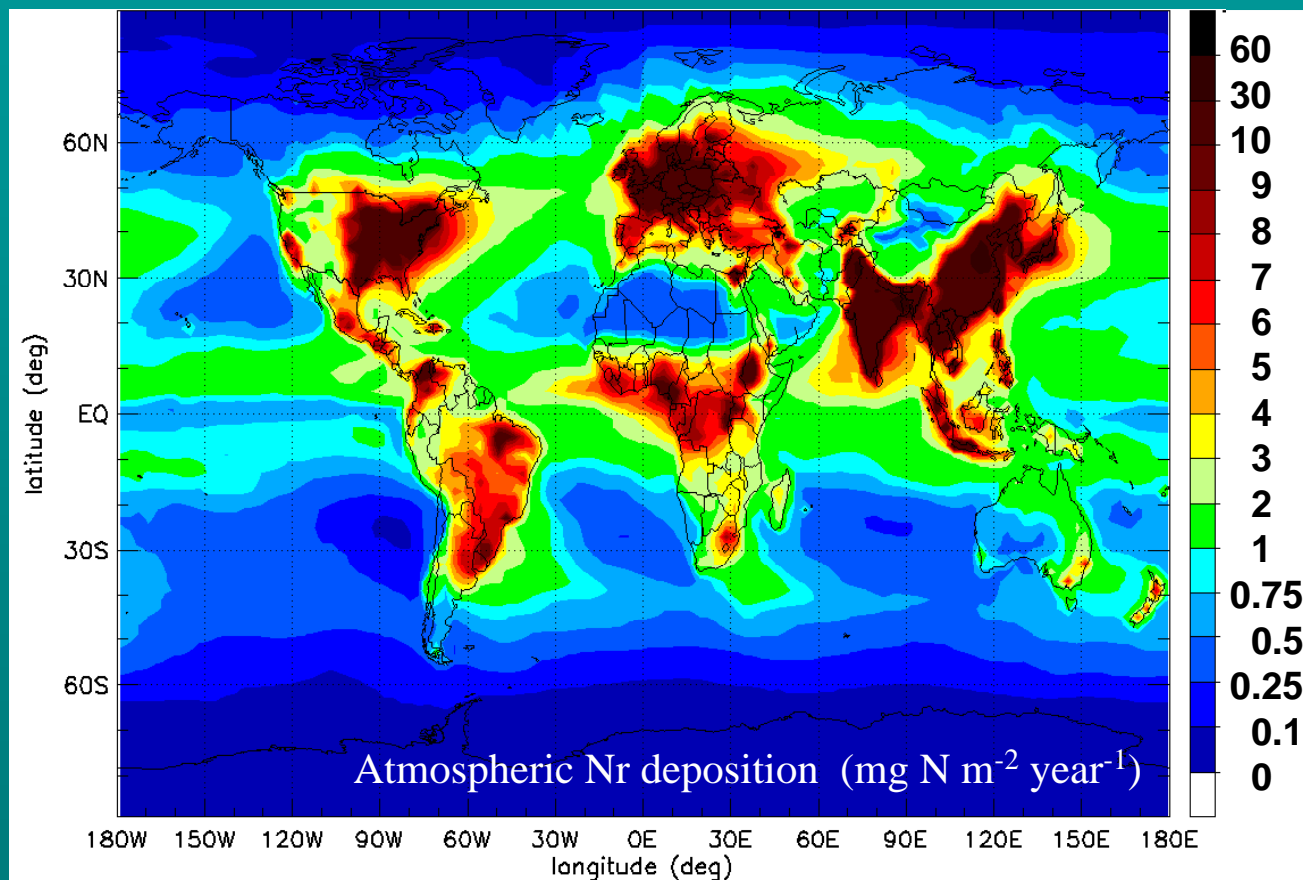
2005: 191

2005 sources:

Haber Bosch: 121

Biol N fixn: 45

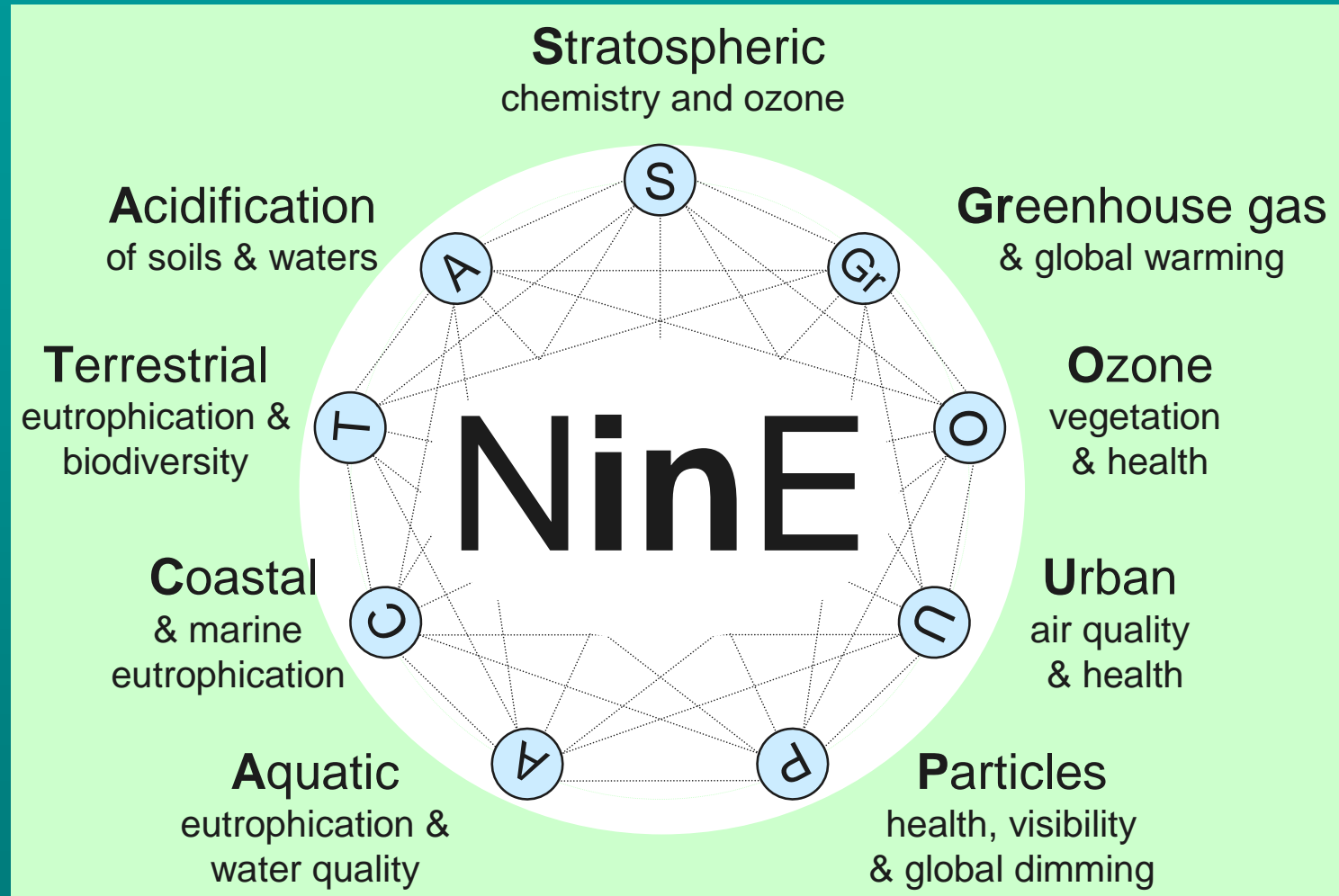
NO_x emission: 25



Galloway et al. *Science* (16 May 2008)

INI steering committee with input NinE and COST 729

ESF programme: Nitrogen in Europe



The nine link issues provide the mnemonic: **ACT AS GROUP**

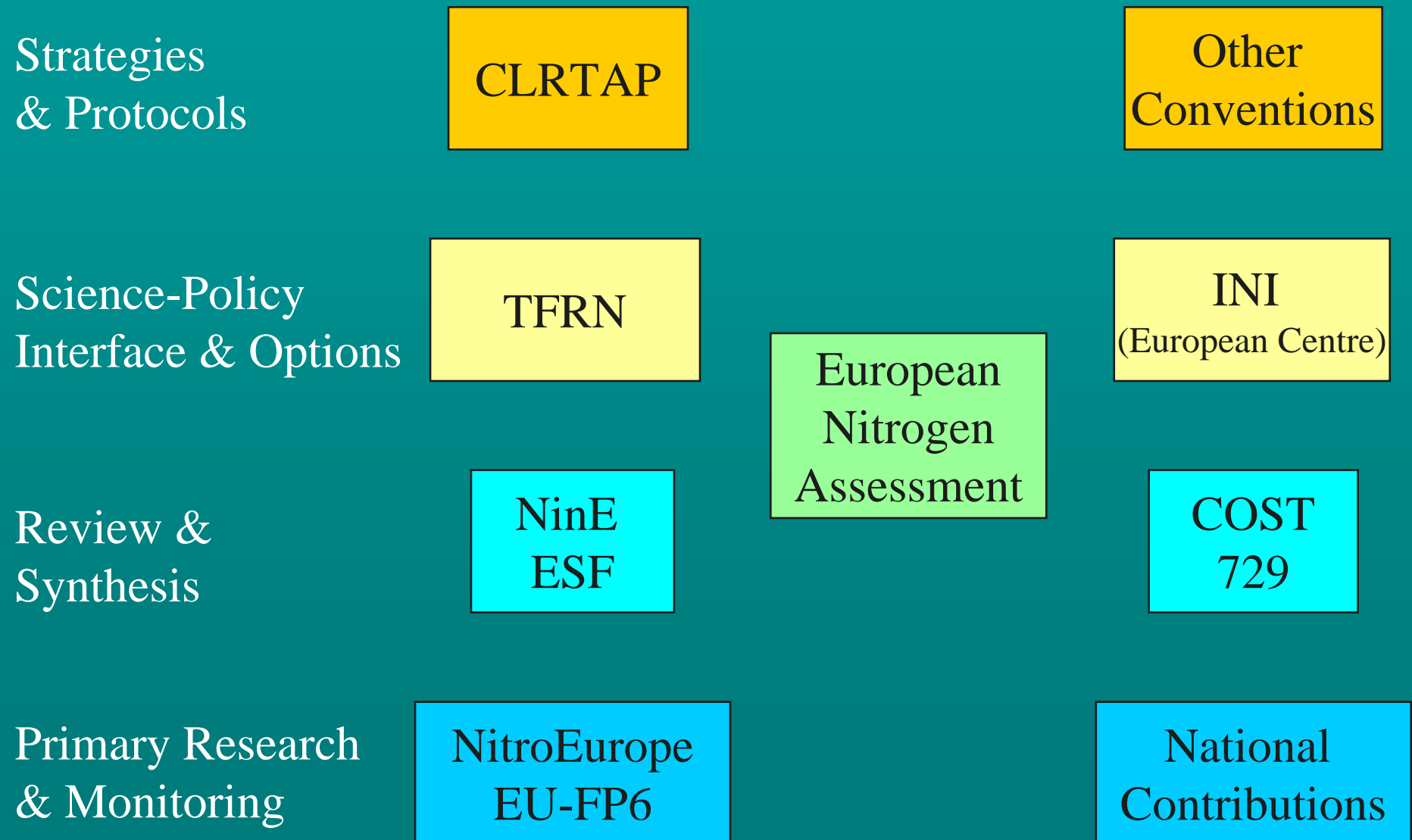
European Nitrogen Assessment (ENA)



- **Major Sponsor:** ESF Nitrogen in Europe (NinE)
- **Information Sources:** NEU and other European research
- **Contribution to:** International Nitrogen Initiative (INI)
- **Reported to:** International Conventions on climate, air, water, biodiversity through the UNECE Task Force on Reactive Nitrogen (TFRN)
- **Timing:** Workshops & chapters 2008-09. Delivery 2010.
- **ENA-1:** 22-23 May 08, Wageningen prior to TFRN-1
- **Product:** Book in discussion with Cambridge University Press.



The building blocks of action



Objectives of the European Nitrogen Assessment

- To review current scientific understanding of nitrogen sources, impacts and interactions across Europe,
- Taking account of current policies and the economic costs and benefits, as a basis to
- Inform the development of future policies at local to global scales.

Overall structure of the ENA

1. Introduction, Scope & Objectives (coordination team)

A. Nitrogen in Europe: the present position.

2. European N problem in global perspective (Erisman)
3. N in current European policies (Oenema)
4. Challenge to integrated N science & policies

B. Nitrogen processing in the biosphere

5. N processes & effects in terrestrial ecosystems (Gunderson & Butterbach Bahl)
6. N processes & effects in aquatic ecosystems (Durand & Breuer)
7. N processes & effects in coastal/marine ecosystems (Voss)
8. N processes & effects in the atmosphere (Hertel)

Overall structure of the ENA

C. Dispersion, budgets & impacts of nitrogen on different scales

9. Rural landscapes (Cellier)
10. Urban landscapes (*Svirejeva Hopkins*)
11. Regional watersheds (inc. coastal & marine) (Billen)
12. Atmos transport & deposition over Europe (Simpson)
13. Integrating N fluxes at European scale
(de Vries & Leip)

Overall structure of the ENA

D. Managing nitrogen in relation to key societal issues

Workshop Summer 2009, Sweden. Need to establish authors!

- Benefits of reactive nitrogen for food, fibre and industrial production
- Prioritizing the 5 key threats of reactive nitrogen
- N and GHG balance
- N and Air quality (esp. PM and ozone)
- N and Terrestrial biodiversity
- N and European water quality
- N and Soil fertility/soil quality (*Velthof*)

Overall structure of the ENA

E. European N policies and future challenges

Workshop Sweden Summer 09, Netherlands. Need authors!

19. Future scenarios
20. Costing nitrogen in the environment (van Grinsven & Klimont)
21. Integrated approaches to better N management
22. Streamlining European nitrogen management between international conventions
23. Societal choice and the European N challenge
24. Communication and dissemination

ENA Relation to TFRN and Workshops

- ENA a key contribution to the work of TFRN
- Next workshops
 - Crieff, Scotland 18-20 June : N Processes
 - Paris, 4-6 Nov: Upscaling N from landscapes to Europe
 - Sweden, May-June 09: Key societal benefits and threats of reactive nitrogen
 - Contact points...