science for global insight

Component 5

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Overall objective of C5:

Make findings of ECLAIRE relevant

for (today's) response strategies

WP18: Quantification of economic benefits of ecosystems

Mike Holland / Rob Maas

- Different valuation methods (willingness-to-pay, restoration costs, quantifying co-benefits with bird&habitat directive) lead to a monetized biodiversity benefit for European Natura2000 areas of > €8 bn/yr

- However, these benefits are not significantly higher than mitigation costs (in contrast to B/C ratio for health)

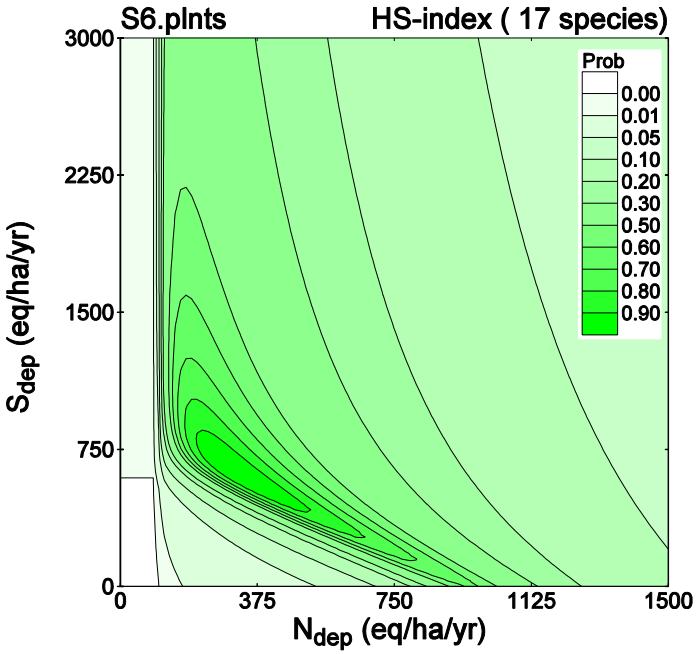
- Do these values support additional NH_3-reduction?

WP19: Integration of climate change effects into impact assessment

Jean-Paul Hettelingh / Max Posch

Habitat Suitability Index:

- Probability for appearance of species
- Function, i.a., of climate (temperature, water availability), S/N deposition, etc.



- GAINS uses S/N depositions to characterize probability of species appearance, for a given set of other factors
- Alternative S/N sets for climate change conditions

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WP20: Implications of/for mitigation and adaptation strategies

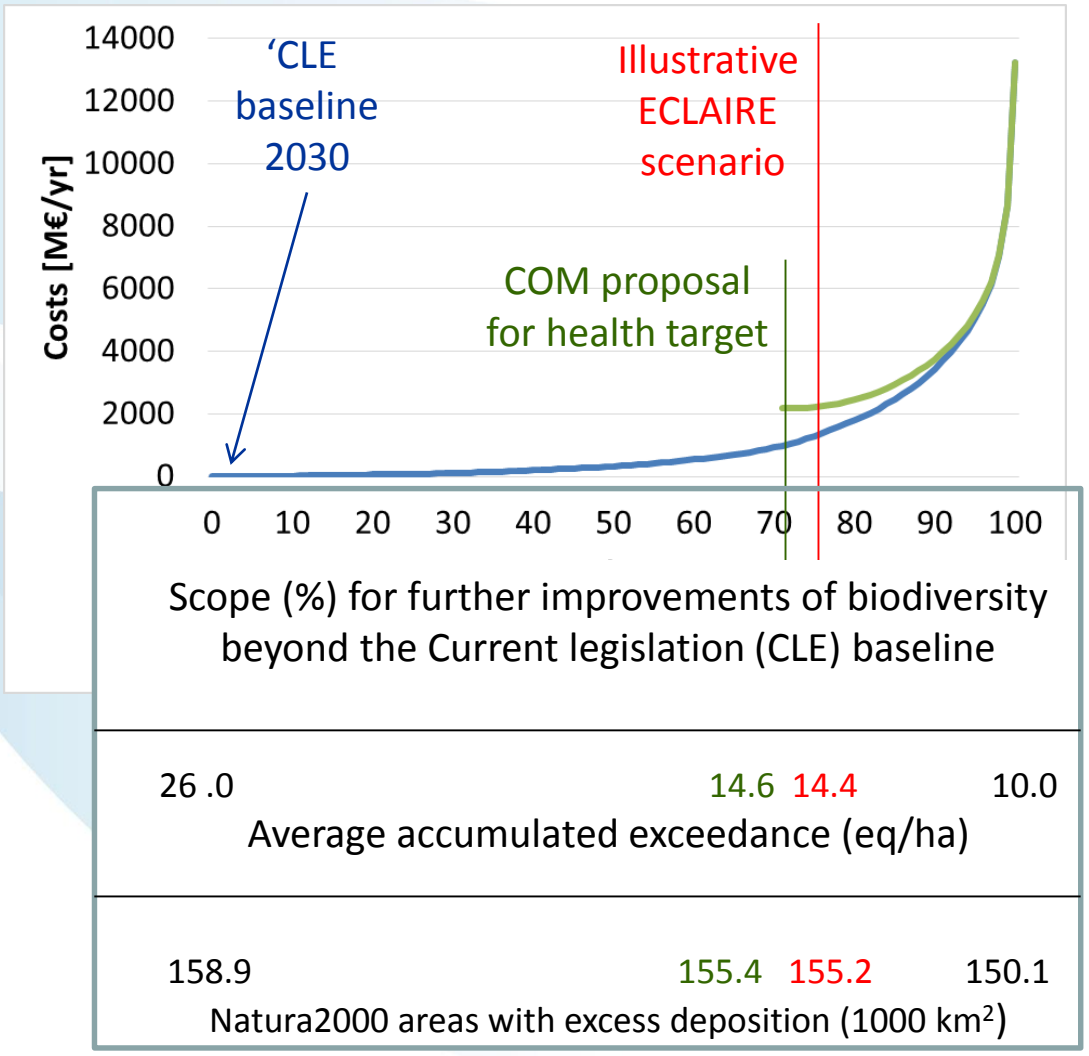
Wilfried Winiwarter / Markus Amann

1. Costs and benefits of improved protection of biodiversity against atmospheric deposition

2. How would climate change affect measures to achieve targets for biodiversity?

3. Scope for policy interventions to reduce ozone damage to vegetation

Costs for improving protection of biodiversity in Natura2000 areas



GAINS optimization for 2030:

- corresponding to scenarios discussed by COM/Council/ Parliament as of April 2015

Illustrative ECLAIRE scenario (relative to COM proposal):

- -0.6 eq/ha less average excess deposition (-4%)
- +193 km² more Natura2000 area protected (+0.12%)
- Mitigation costs +23 mio €/yr (+1%)
- Monetized benefits?

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How much would it cost to compensate climate change impacts on biodiversity via (1) increased vulnerability to air pollution, (2) increased NH_3 emissions

	Central case, Current climate 2030		With biodiversity indicators under climate change**)			With higher NH_3 emissions due to climate change ***)		
	HS indicator (eq/ha)	Costs *)	HS indicator (eq/ha)	Additional costs to return to central case *)		HS indicator (eq/ha)	Additional costs to return to central case *)	
CLE	26.0	0	30.9	+95	0.11%	26.7	+26	0.03%
COM proposal	14.6	2189	17.7	+889	1.03%	14.9	+236	0.27%
ECLAIRE scenario	14.0	2212	16.3	+1333	1.54%	14.4	+386	0.33%

*) million €/yr, on top of current legislation /% of CLE costs

**) for 2050 climate scenario (+1 degree relative to today)

***) ~4% higher total NH_3 emissions in EU-28

Could reduced air pollution compensate climate change impacts on biodiversity? At what costs?

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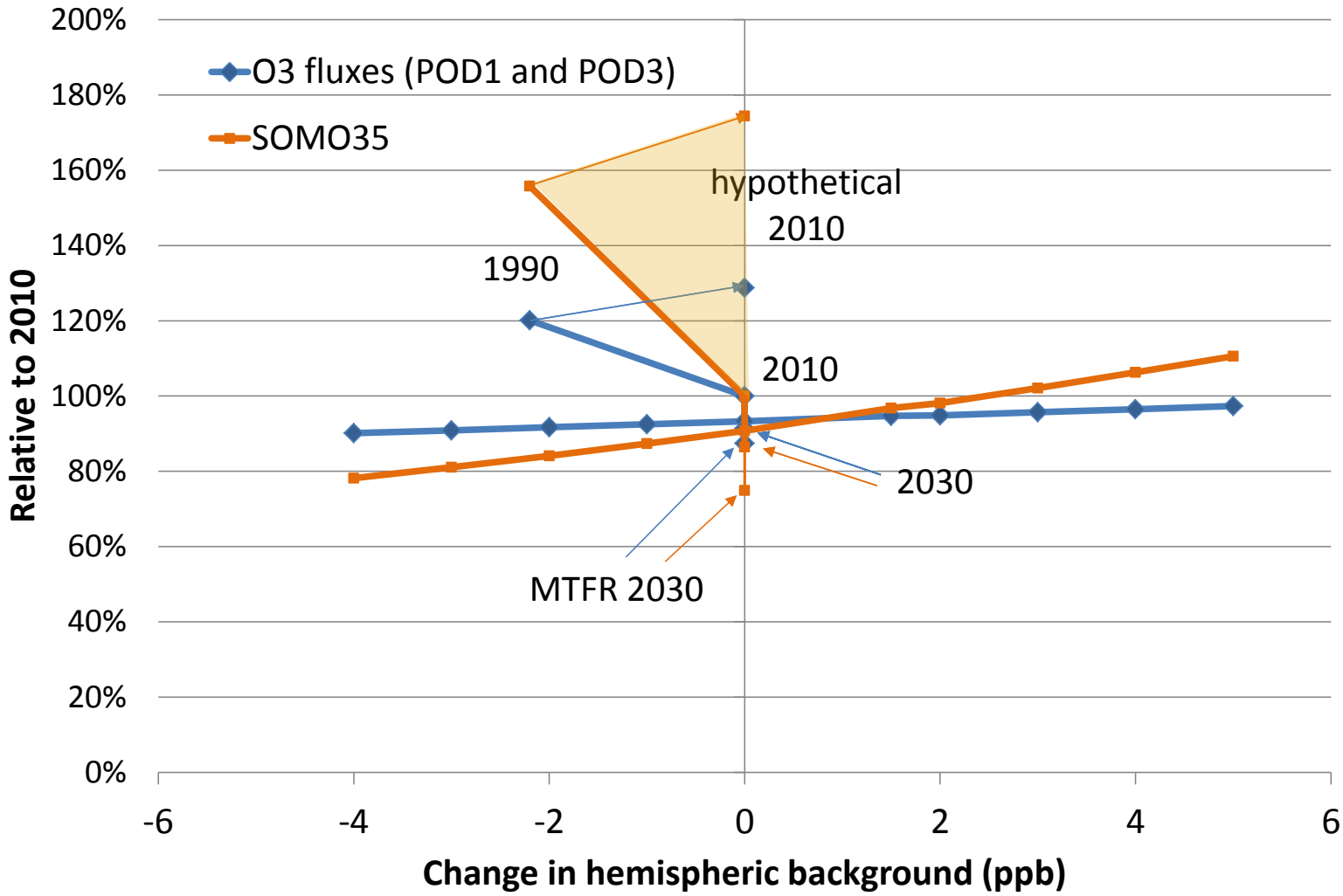
Scope for further reducing O_3 damage to vegetation and health



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Tentative conclusions

- ECLAIRE has developed an indicator and monetization for biodiversity losses.
- There is rather little scope for further improvements of the current HS biodiversity indicator value beyond what would result from the TSAP proposal (by 3-5%, even with MTFR).
- Climate change is expected to enhance stress on biodiversity via higher vulnerability and NH3 emissions. For 2030, compensation of increased vulnerability would increase pollution control costs by up to 60%; temperature-related increase of NH_3 has less impact.
- Current models suggest that O_3 fluxes have declined by 20% since 1990; there seems to be rather little scope for further reductions through European and even hemispheric measures beyond CLE. What about impacts?