

Provisional ranges of ecosystem benefits

Workshop valuation of ecosystem benefits of air pollution abatement

Lieven De Smet, Arcadis Ecolas

Outline

- Overview of estimates for different ecosystem services
- Decreased costs of nature management
- Issues concerning the usefulness of existing studies
- Provisional ranges of ecosystem benefits – key questions

Marine ecosystems - eutrophication

	<i>Method</i>	<i>Spatial horizon</i>	<i>Reduction</i>	<i>€ Million/year</i>	<i>Benefits</i>
1	CVM	Baltic sea - Swedes	50%	1241	TEV minus commercial fishing
	Several CVMs	Baltic sea - entire basin	-	3712	-
2	TCM	Baltic sea - Swedes	50%	28 - 64	Recreation
	TCM	Laholm bay	50%	1 - 4	Recreation
3	CVM	Stockholm archipelago	30%	59 - 98	TEV
4	TCM	Stockholm archipelago	30%	9 - 30	Recreation
5	CVM	Laholm Bay	50%	88	-

1. (Gren et al., 1997); 2. (Sandström, 1996); 3. (Söderqvist et al., 2000); 4. (Soutukorva, 2005); 5. (Fyckblom, 1998)

Marine ecosystems - eutrophication

	<i>Method</i>	<i>Spatial horizon</i>	<i>Reduction</i>	<i>€ Million/year</i>	<i>Benefits</i>
6	DCM	Chesapeake bay	CAAA	336 - 1253	Recreation and commercial fishing
		Long Island Sound		25 - 98	
		Tampa Bay		11 - 66	

6. (USEPA, 1999)

Forests – ground-level ozone

	<i>Method</i>	<i>Spatial horizon</i>	<i>Reduction</i>	<i>€ Million/year</i>	<i>Benefits</i>
1	MPM	Sweden	Damage assessment	56	Forest production
		EU25		319	
2	MPM	United States	50 %	14 - 39	Timber

1. (Karlsson et al., 2005); 2. (USEPA, 1999)

Forests - acidification

	<i>Method</i>	<i>Spatial horizon</i>	<i>Reduction</i>	<i>€ Million/year</i>	<i>Benefits</i>
1	MPM	Europe	Damage assessment – UK coal fired power plant	12	Timber
2	MPM	United States	Damage assessment 5 to 15 % decrease	498 - 747	Commercial timber

1. (Gregory et al., 1996); 2. (Callaway et al., 1986)

Freshwater - acidification

	<i>Method</i>	<i>Spatial horizon</i>	<i>Reduction</i>	<i>€ Million/year</i>	<i>Benefits</i>
1	CVM	Norway	Second Sulphur Protocol	82 – 164	Fish stocks
2	-	lakes in the Adirondacks	CAAA (critical pH 5.0)	15 - 60	Recreational fishing
			CAAA (critical pH 5.4)	101 - 108	
3	TCM	lakes in the Adirondacks	Damage assessment	1 - 18	Recreational fishing
4	TCM	lakes in the Adirondacks	Damage assessment	2	Recreational fishing

1. (Navrud, 2002); 2. (USEPA, 1999); 3. (Callaway et al., 1986); 4. (Mullen et al., 1985)

Complex of different ecosystems - acidification

	<i>Method</i>	<i>Spatial horizon</i>	<i>Reduction</i>	<i>€ Million/year</i>	<i>Benefits</i>
1	CVM	Adirondacks	Future policies	286 - 935	TEV
2	CVM	Nature in the Netherlands	Healthy situation by 2030	221	Non-use and recreational perception

1. (Banzhaf et al., 2004); 2. (Ruijgrok et al., 2002)

Decreased costs of nature management

	<i>Spatial horizon</i>	<i>Ecosystem</i>	<i>Reduction</i>	<i>€ Million/year</i>	<i>Benefits</i>
1	The Netherlands	Heathland	-	1,46	Less turfing
2	The Netherlands	-	Gothenburg protocol	0 – 1,3	Increase in well field life
3	Norway	Freshwater bodies	No need to lime any longer	14,75	No liming

1. (Wamelinck et al., 2003); 2. (Van der Velde et al., 2005) ; 3. (Sandøy et al., 1995)

Issues concerning the usefulness of existing studies

- If already specified, the reduction scenarios often lack policy relevance.
The results can therefore, at best, only be used as an indication.
- The number of studies is limited. Limited geographical coverage, # ecosystem types and # ecosystem services
- The scientific underpinning of the ecological effects was often of minor importance.
- Many dose-effect relations are still quite uncertain
- Many studies are old
- Known difficulties with stated preference methods

Provisional ranges of ecosystem benefits – key questions

- Is it desirable to have ranges, indicating the likely lower and upper bound monetary estimates of ecosystem benefits, based on the existing studies?
- If so, should one also attempt to transfer these benefits in order to get a more complete geographical coverage?
- Is it possible to apply benefits transfer from existing valuation studies in other areas (e.g. climate change policy, land use policy,...) to the impacts of air pollution on ecosystems?