

Für Mensch & Umwelt

Umwelt 
Bundesamt

Reporting and Quality Standard for Environmental Economic Valuation

Berichts- und Qualitätsstandards für die Umweltökonomische Bewertung

Jan Philipp Schägner

Luke Brander

Andrea Ghermandi

Fernando Rodríguez López

Kateřina Kaprová

Giovanni Signorello

Colino-Rabanal VJ

Dolf de Groot

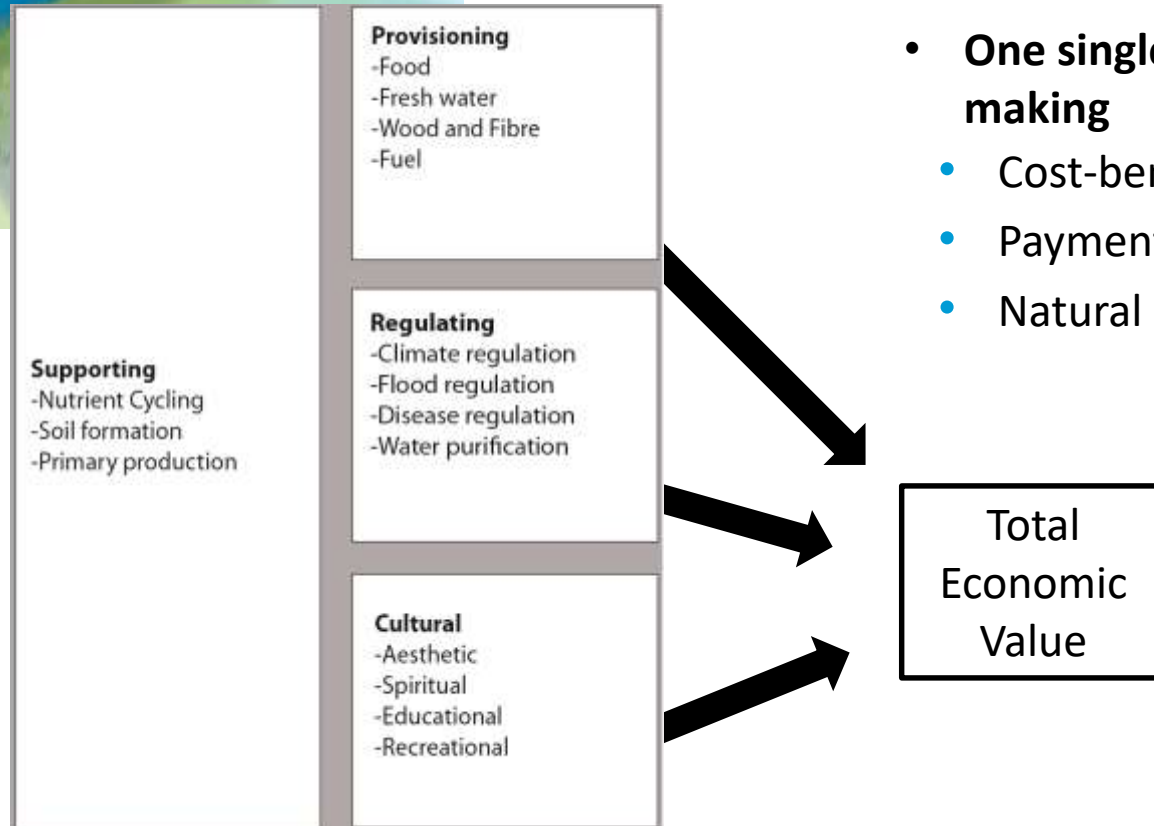
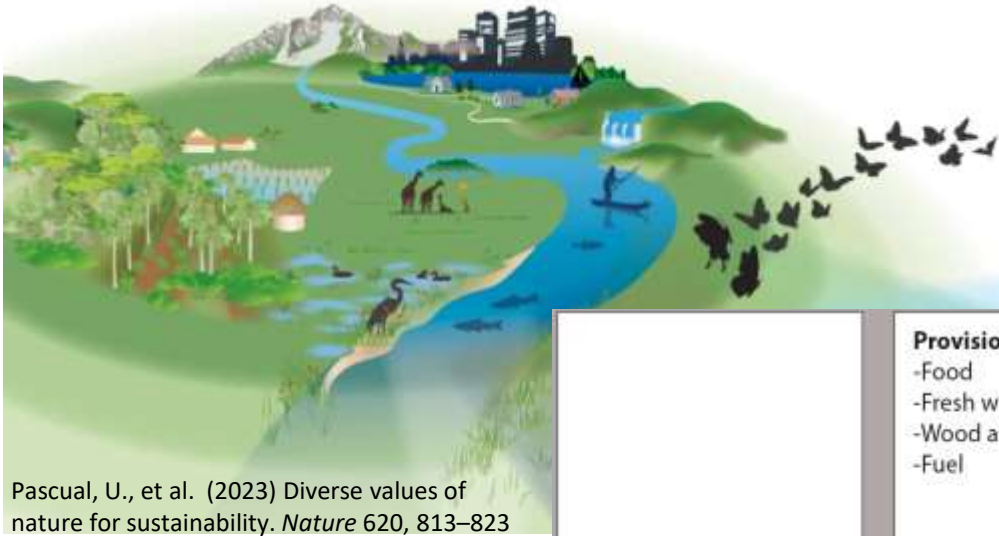
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The background features a collage of two nature scenes. The top-left scene shows a tropical island with palm trees and a blue ocean under a cloudy sky. The bottom-right scene shows a savanna landscape with a rhinoceros in the foreground and acacia trees in the background. The text 'Why to value?' is centered in a blue font over a white background.

Why to value?

Why to value nature?



- **Multidimensional impacts of ecosystem interventions**
- **Valuation to reduce complexity**
- **Decisions support**
- **One single dimension as basis for decision making**
 - Cost-benefit analysis
 - Payments for ecosystem services
 - Natural capital accounting

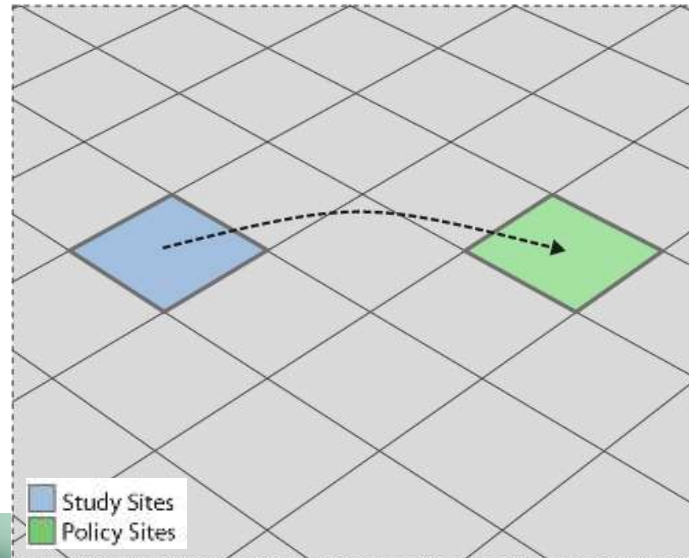


Benefit Transfer

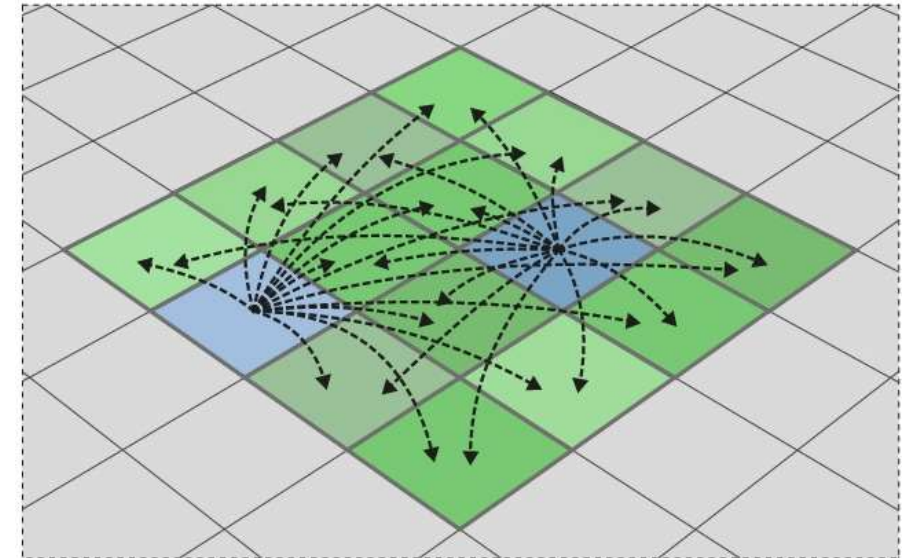
Benefit / value transfer

- Primary valuation cost - & time consuming
- Transfer values from a study to policy site
- Benefit / value transfer
- **Requirement: primary valuation data**

Unit Value Transfer



Meta-Analytic Value Transfer



Methodological Convention 3.1 for the
Assessment of Environmental Costs

Value Factors

Version 12/2020

$$EV = \alpha + \beta_{St} X_{St} + \beta_{Si} X_{Si} + \beta_{Co} X_{Co}$$

The equation is presented with three variables in rounded boxes above them: 'Study Variables' (blue), 'Spatial Site Variables' (green), and 'Spatial Context Variables' (green).



Ecosystem Service Valuation Database (ESVD)

ESVD web functionalities

- Biggest open-access valuation database
- Freely accessible
- ESVD.info

Search Results →

The screenshot shows the ESVD web interface with the following components:

- Navigation:** Home, Database, Suggest a Study, and a user profile 'lukebrander'.
- GET STARTED:** A section with instructions on how to use the filters and actions.
- Filters:** A sidebar on the right with dropdown menus for 'Inland wetlands', 'Country', 'Continent', 'Protection Status', 'TEEB ES services', and 'CICES'. It includes 'Get valuations' and 'Clear filters' buttons.
- Search Results:** A table with 738 rows. The visible columns are StudyID, Location Name, Countries, Biomes, Ecosystems, and TEEB EE. The first few rows show data for Ribeirão São Jerônimo in Brazil.
- Actions:** A sidebar on the right with buttons for 'Show summary statistics', 'Download valuations as CSV', 'Suggest a Study', and 'Get full ESVD as CSV'.

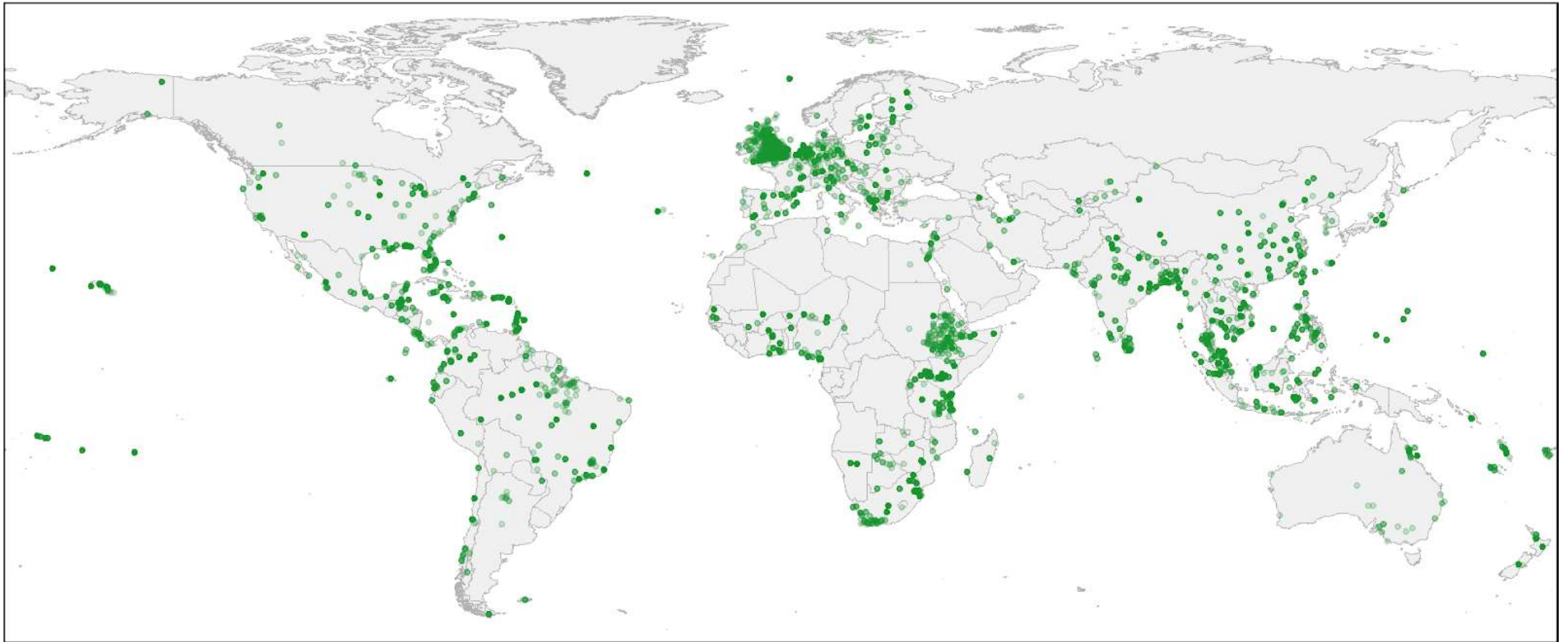
← Search Filters

← Summary statistics

← Download Data

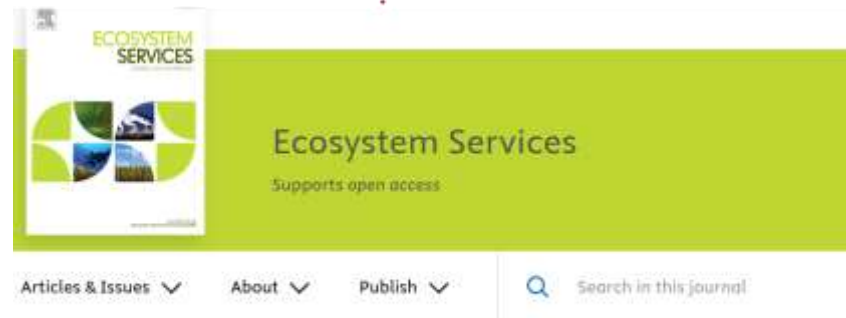
Ecosystem Service Valuation Data Base (ESVD)

- **Covering all biomes, ecosystem services & regions**
- **Currently working on German up-date**

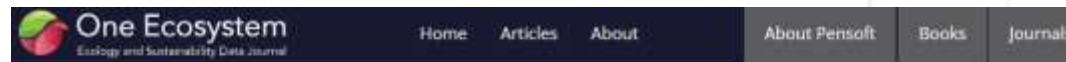


Ecosystem Service Valuation Data Base (ESVD)

- Substantial growth in data points
- ESVD Germany early next year



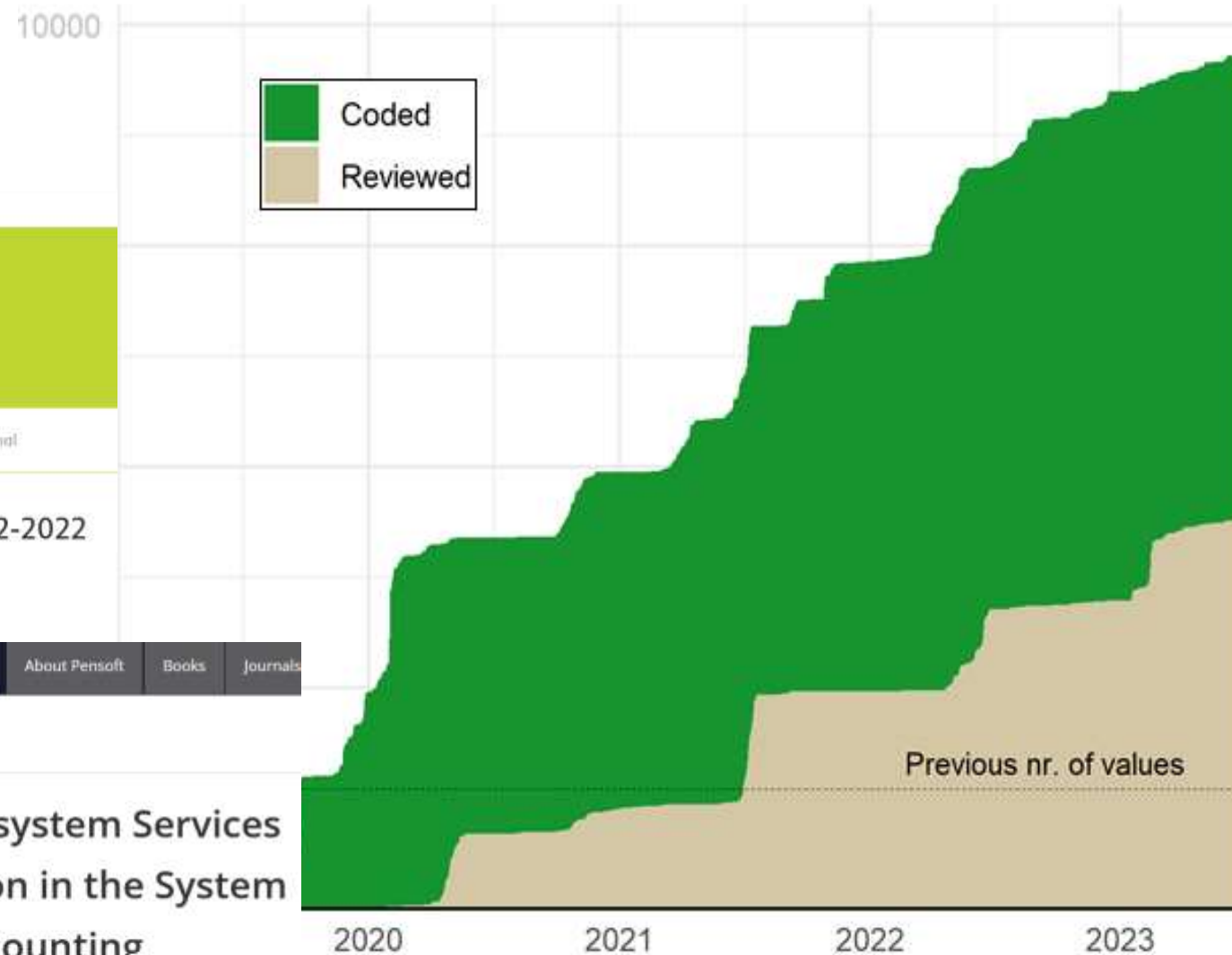
A decade of ecosystem service research: 2012-2022



Research Article One Ecosystem 7: e85085
<https://doi.org/10.3897/oneeco.7.e85085> (03 Nov 2022)

On the potential use of the Ecosystem Services Valuation Database for valuation in the System of Environmental Economic Accounting

↳ Luke M. Brander, Jan Philipp Schägner, Rudolf de Groot



Structure of the ESVD

ValueID	StudyID	Biome	Ecosystem	Ecosystem Service (incl. of TEES)	TEES Ecosystem Service	TEES ES Subservice	CRIS V5.1 Code	Country	Scale of study site	Site Area in Hectares	Valuation Method	Value	Currency ISO Code	Value Year	Spatial Unit	Temporal Unit	Beneficiary Unit	int\$/ha/year
1	2	Coastal systems	Mangrove fringe	Fisheries	1	11	1.1.6.1	Mexico	Sub-national	5000	PF	17500	USD	2005	hectare	year	total	74885.66715
5	4	Coastal reefs	Barrier	Fisheries	1, 19	11, 194	1.1.6.1, 1.3.3.8	Australia	National	725340	ID	139000000	AUD	2007	total area	year	total	160.4805623
6	4	Coastal reefs	Barrier	Tourism value	19	192	1.1.1.1, 3.1.1.2	Australia	National	725340	ID	5117000000	AUD	2007	total area	year	total	5987.744453
7	4	Coastal reefs	Barrier	Recreational value	19	191	1.1.1.1, 3.1.1.2	Australia	National	725340	FI	153000000	AUD	2007	total area	year	total	
8	4	Coastal reefs	Barrier	Fisheries	1, 19	11, 194	1.1.6.1, 1.3.3.8	Australia	National	725340	ID	130000000	AUD	2006	total area	year	total	157.6111877
9	4	Coastal reefs	Barrier	Tourism value	19	192	1.1.1.1, 3.1.1.2	Australia	National	725340	ID	476000000	AUD	2006	total area	year	total	5775.843812
10	4	Coastal reefs	Barrier	Recreational value	19	191	1.1.1.1, 3.1.1.2	Australia	National	725340	FI	143000000	AUD	2006	total area	year	total	
11	4	Coastal reefs	Barrier	Fisheries	1, 19	11, 194	1.1.6.1, 1.3.3.8	Australia	National	725340	ID	135000000	AUD	2005	total area	year	total	172.0078954
12	4	Coastal reefs	Barrier	Tourism value	19	192	1.1.1.1, 3.1.1.2	Australia	National	725340	ID	427000000	AUD	2005	total area	year	total	5446.910887
13	4	Coastal reefs	Barrier	Recreational value	19	191	1.1.1.1, 3.1.1.2	Australia	National	725340	FI	134000000	AUD	2005	total area	year	total	
14	5	Inland wetlands; Rivers an	Floodplains; Rivers	Ground water recharge (a) 2; 50				Nigeria, Federal Republic of	Local	41300	PF	2566	NGN	1996	hectare	year	total	301.759222
15	5	Inland wetlands; Rivers an	Floodplains; Rivers	Ground water recharge (h) 2; 10				Nigeria, Federal Republic of	Local	41300	PF	1146588	NGN	1996	total area	day	total	
16	5	Inland wetlands; Rivers an	Floodplains; Rivers	Ground water recharge (w) 2; 10				Nigeria, Federal Republic of	Local	230000	PF	62	USD	1996	hectare	year	total	711.5460879
17	5	Inland wetlands; Rivers an	Floodplains; Rivers	Ground water recharge (a) 2; 10; 18; 20				Nigeria, Federal Republic of	Local	230000	PF	4	USD	1996	hectare	year	total	45.90619922
18	6	Inland wetlands	Floodplains	Flood protection	9			France, French Republic	Local	6500	BC	396000000	FRF	1996	total area	year	total	80335.20484
19	6	Inland wetlands	Floodplains	Flood protection	9			France, French Republic	Local	1037	BC	230000000	FRF	1996	total area	year	total	2935566.641
20	6	Inland wetlands	Floodplains	Flood protection	9			France, French Republic	Local	15000	BC	330000000	FRF	1996	total area	year	total	29118.20841
21	6	Inland wetlands	Floodplains	Flood protection	9			France, French Republic	Local	2934	BC	200	FRF	1996	hectare	year	total	264.711531
22	6	Inland wetlands	Floodplains	Nutrient sink	19			France, French Republic	Local	560	BC	560	FRF	1996	total area	year	person	
23	6	Inland wetlands	Floodplains	Nutrient sink and pesticide	19; 10			France, French Republic	Local	1000000	BC	51000000	FRF	1996	total area	year	total	67.50144341
24	6	Inland wetlands	Floodplains	Nutrient sink and pesticide	19; 10			France, French Republic	Local	6500	BC	81000000	FRF	1996	total area	year	total	18526.80737
25	6	Inland wetlands	Floodplains	Groundwater aquifer recharge	10			France, French Republic	Local	5000	BC	175000000	FRF	1996	total area	year	total	48324.51781
26	7	Tropical forest	Tropical rain forest	Existence Value	23	231	3.2.2.1	Brazil, Federative Republic of	Local	31000	CV	2113548	USD	2005	total area	year	total	163.1116974
27	7	Tropical forest	Tropical rain forest	Existence Value	23	231	3.2.2.1	Brazil, Federative Republic of	Local	348574	CV	3003463	USD	2005	total area	year	total	23.20727766
29	8	Coastal systems	Mangrove	Fuel wood	3	55	1.1.1.3	Sri Lanka	Local	431	MP	218000	LKR	2003	total area	year	total	31.4890945
30	9	Inland wetlands; Rivers an	Floodplains; Rivers	Cropping (Value of water 2)	3	100		South Africa, Republic of	Local	100	FI	1072	USD	2006	total area	year	household	68472.11375
31	9	Inland wetlands; Rivers an	Floodplains; Rivers	Edible Plant Collection + R 3	3	100		South Africa, Republic of	Local	100	FI	365	USD	2006	total area	year	household	16526.80873
32	9	Inland wetlands; Rivers an	Floodplains; Rivers	Fuel Wood	3	100		South Africa, Republic of	Local	100	FI	667	USD	2006	total area	year	household	42605.45137
33	9	Inland wetlands; Rivers an	Floodplains; Rivers	Hunting & Fishing	1	100		South Africa, Republic of	Local	100	FI	61	USD	2006	total area	year	household	3866.267667
34	10	Coastal systems	Mangrove	Fisheries	1	11	1.1.6.1	Pakistan, Islamic Republic of	Local	3431.96	FI	1287	USD	2005	hectare	year	total	4291.86665
35	11	Rivers and lakes	Lakes, freshwater	Use value (recreation)	1; 2; 11; 19	15; 21; 114; 191; 192; 19	1.1.5.1, 1.1.6.1, 4.2.1.1.2	Iran, Islamic Republic of	Local	CV	31050	IRR	2010	total area	year	person		
36	11	Rivers and lakes	Lakes, freshwater	Use value (recreation)	18; 17	171; 181	1.1.2.4, 2.2.3.3	Iran, Islamic Republic of	Local	CV	30950	IRR	2010	total area	year	person		
37	11	Rivers and lakes	Lakes, freshwater	Use value (recreation)	1; 2; 11; 19	15; 21; 114; 191; 192; 19	1.1.5.1, 1.1.6.1, 4.2.1.1.2	Iran, Islamic Republic of	Local	CV	41400	IRR	2010	total area	year	person		

- Values are standardised to int\$/ha/year
- 106 variables
- Data collection is time consuming **due to insufficient reporting**

Consequences of Insufficient Reporting

- **GENERAL:**
 - Loss of knowledge
 - Limited reproducibility
 - Limited quality assessment
- **META-ANALYSIS**
 - Small sample sizes
 - Inconsistent environmental goods
 - Missing covariates
 - Simplistic factorial variables
 - Lengthy study coding process

The background features a collage of nature scenes. On the left, a tropical island with palm trees and a beach is visible. On the right, a savanna landscape with a rhinoceros in the foreground and acacia trees in the background is shown. The scenes are separated by white, wavy, organic shapes.

Reporting and Quality Standard

Reporting and Quality Standard / Protocol

- **Ease and improve the review process**
- **Ease the quality assessment of valuation studies**
- **Improve quality of valuation studies**
- **Enhance reproducibility of valuation studies**
- **Ease their use for meta-analysis and benefit transfer**
- **Improve meta-analytic value transfer for decision-making**
- **Supporting the advancement in environmental valuation**

Reporting and Quality Standard III

- **Environmental commodity**

- Biophysical capital
- Man-made capital
- Scope & scale

- **Context of environmental commodity**

- Biophysical capital
- Man-made capital
- Human capital

- **Valuation methodology**

- Often strong explanatory power
- Valuation methodology specific (Survey type, response rate, summary stats, substitutes etc.)

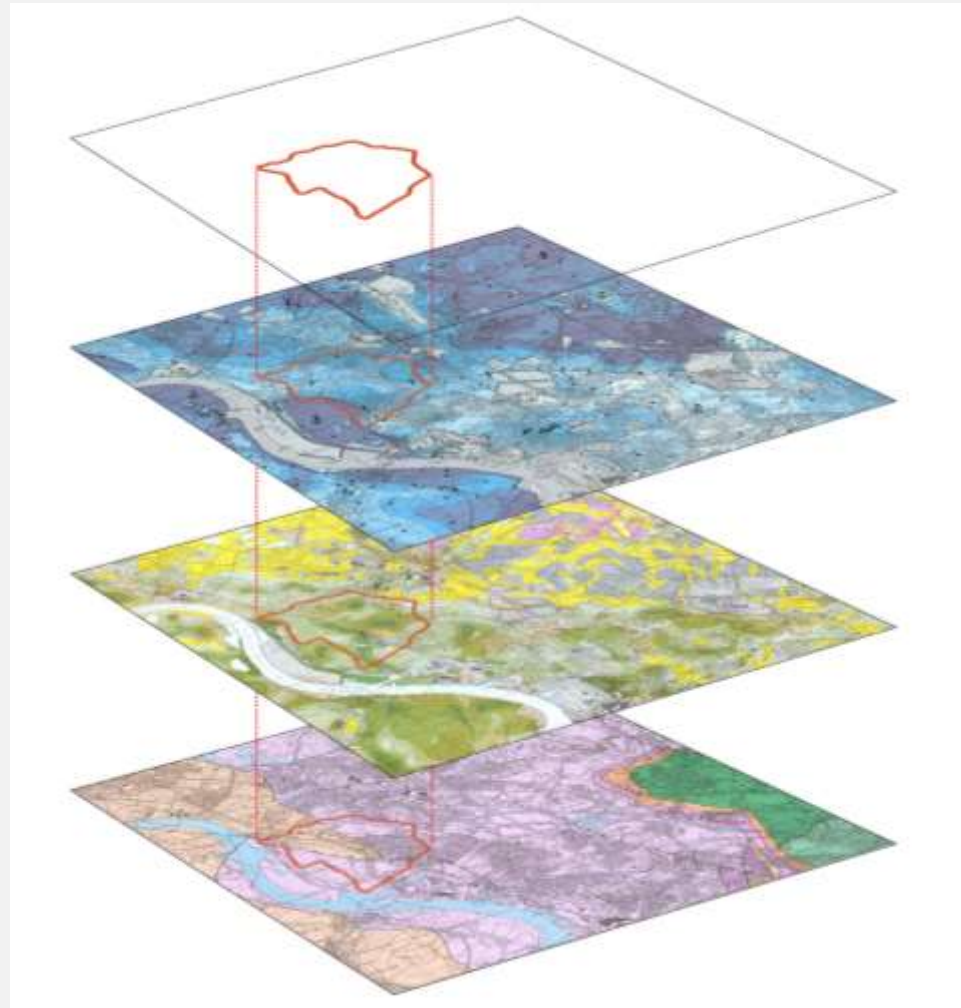
- **Value metrics**

- CSP, WTP, TC, market prices, marginal or average values, as total values or per hectare, per household or individual, absolute or relative changes, ...

	F	G	H	I	
on	Ecosystem				
tion	Ecosystem (text description from study)	Biome	Ecosystem	Comments	Ec (t
015	Mangrove	3 Coastal systems (incl wetlands)	3.4 Mangroves		Ti
015	Mangrove	3 Coastal systems (incl wetlands)	3.4 Mangroves		Fi
015	Mangrove	3 Coastal systems (incl wetlands)	3.4 Mangroves		Pr
			14.8 Other (cultivatec		
			15.1 Urban Parks & Fi		
			15.2 Lawns, sports fie		
			15.3 Urban lakes, por		
			15.4 Cultivated areas		
			15.5 (Street) Trees &		
			15.6 Other (urban gre		
			16 Other		

GIS & the Study Area Location

- Study areas' locations often poorly described
- GIS technologies allow ex-post site & context characterisation
 - Comprehensive
 - Objective



Conclusion

Conclusion

- **Benefit transfer of great relevance for natural capital accounting.**
- **Valuation data is crucial for successful benefit transfer.**
- **ESVD is a main valuation data provider and continuously growing.**
- **Data gathering is hampered by insufficient reporting in primary valuation studies.**
- **Our proposed reporting standard may:**
 1. Ease the reviewing process
 2. Improve the quality of valuation studies
 3. Ease the use of studies for benefit transfer and secondary research (e.g. meta-analysis)
 4. Improve decision-making