

The Common International Classification of Ecosystem Services (CICES)

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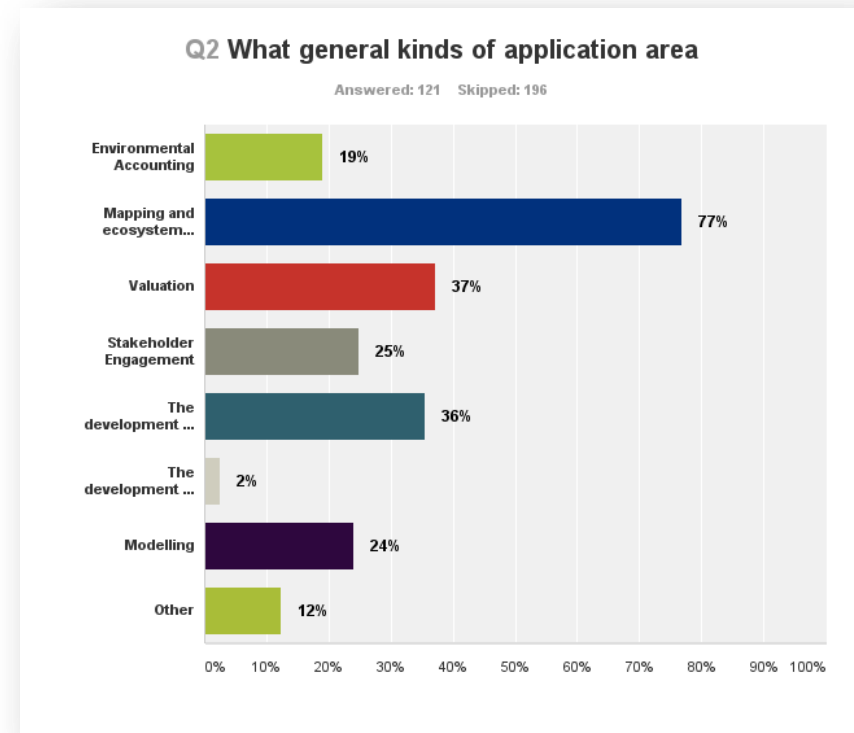
UNSD Expert Group Meeting "Towards a
Standard International Classification on
Ecosystem Services", New York, 20-21 June.

Overview

- Purpose and nature of CICES
- Scope and coverage of CICES
- Structure of the classification
- Principles used in constructing the classification
- Concepts of 'ecosystem services' used in the classification
- Current status and developments

Purpose and nature of CICES

- To provide a way of systematically describing the contributions that *living systems* (“biodiversity”) make to human well-being.
- Originally designed in the context of land accounting and the revision of SEEA in 2009.
- Now used for a variety of purposes (**see** recent User Survey)



Purpose and nature of CICES

- It is an operational system....
- There is a strong user base in Europe and elsewhere...
 - Significant number of EU research projects and peer review publications that use CICES
 - It forms the basis of work on mapping and assessing ecosystems and their services under Action 5 of the EU Biodiversity Strategy to 2020, in the [EU MAES Process](#)
- Used in EU KIP INCA project to design ecosystem service accounts for the EU
- Used by a number of EU Member States for national level work on ES accounts

Scope and coverage of CICES

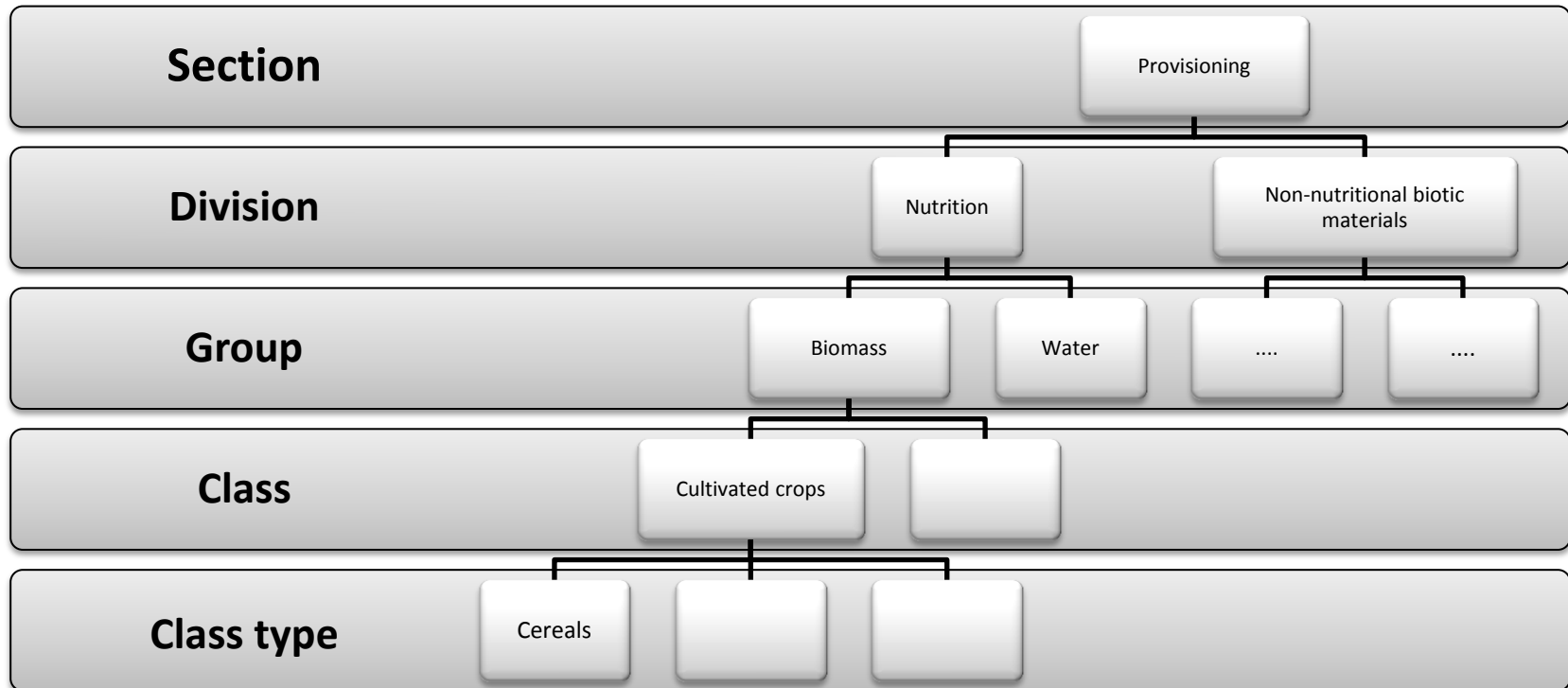
- Designed to have a resonance with the way people are working on 'ecosystem services'
 - Hence focus on biotic outputs from ecosystems
 - This is not to say abiotic outputs are not important, but that they need to be handled differently
 - Hence the structure based on an adaptation of the original framing of the Millennium Ecosystem Assessment (MA):
 - Provisioning, Regulating, Cultural and ~~(Supporting)~~

Scope and coverage of CICES

- Provisioning: the nutritional, material and energetic contributions of living systems to essential human needs & economic activity
- Regulation and maintenance: the ways in which living organisms can mediate or moderate the ambient environment that affects human quality of life, safety and production systems
- Cultural: the non-material, and normally non-consumptive, outputs of ecosystems that affect the physical and mental well being of people

Structure of CICES

Version 4.3



Structure of CICES

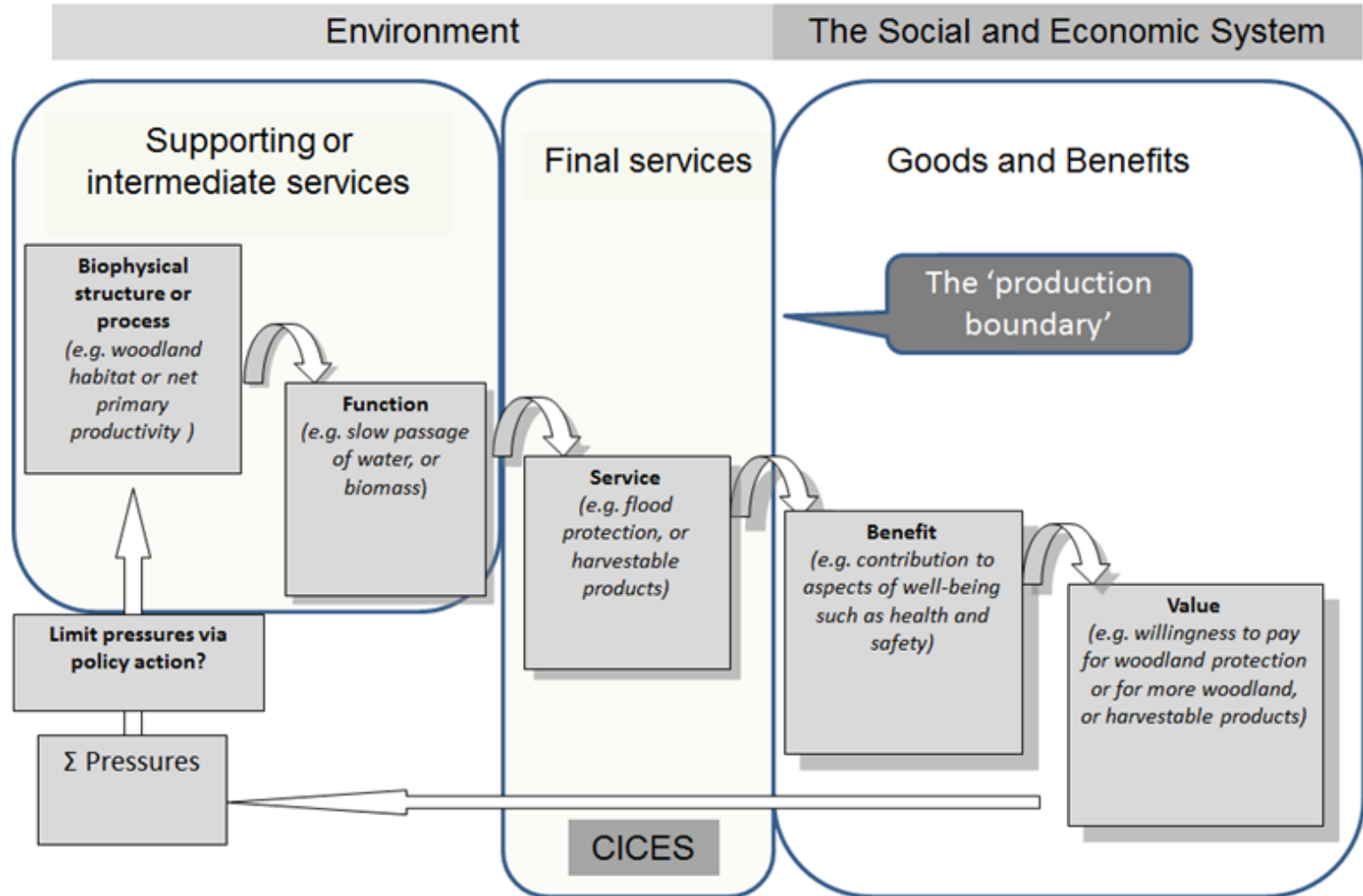
CICES V4.3					
Section	Division	Group	Class	Code	
1. Provisioning	1. Nutrition	1. Biomass	1. Cultivated crops	1.1.1.1	
			2. Reared animals and their outputs	1.1.1.2	
			3. Wild plants, algae and their outputs	1.1.1.3	
			4. Wild animals and their outputs	1.1.1.4	
			5. Plants and algae from in-situ aquaculture	1.1.1.5	
			6. Animals from in-situ aquaculture	1.1.1.6	
	2. Water		1. Surface water for drinking	1.1.2.1	
			2. Ground water for drinking	1.1.2.2	
	2. Materials	1. Biomass	1. Fibres and other materials from plants, algae and animals for direct use or processing	1.2.1.1	
			2. Materials from plants, algae and animals for agricultural use	1.2.1.2	
			3. Genetic materials from all biota	1.2.1.3	
		2. Water		1. Surface water for non-drinking purposes	1.2.2.1
				2. Ground water for non-drinking purposes	1.2.2.2
	3. Energy	1. Biomass-based energy sources	1. Plant-based resources	1.3.1.1	
2. Animal-based resources			1.3.1.2		
2. Mechanical energy		1. Animal-based energy	1.3.2.1		



CICES V4.3
Section
Processing
Regulation & Maintenance
Cultural

Intellectual and representative interactions	Scientific Educational Heritage, cultural Entertainment Aesthetics	Knowledge systems and educational values, cultural diversity, aesthetic values	Inspiration for culture, art and design, aesthetic information
Spiritual, symbolic and other interactions with biota, ecosystems, and land/landscapes	Spiritual and/or emblematic Symbols Sacred and/or religious Other cultural outputs	Spiritual and religious values	Information and cognitive development
	Existence Request		

Principles used in constructing of CICES



Key aspects to consider

- The notion of a 'final service'
- Coverage of abiotic ecosystem outputs
- The distinction between services, and goods and benefits
- The importance of understanding ecosystem function (>>implications for capacity condition accounts)
- Getting to grips with 'double counting....'

Concept of 'ecosystem services' used in CICES

CICES services are '**final**' in the sense that the ecosystem outputs or characteristics that contribute to well being are still *connected to* or *dependent upon* the ecological structures, processes and functions that underpin them.

Boyd and Banzhaf (2007) ES are the directly consumed ecological components of ecosystems

NESCS:the *direct* contributions made by nature to human production processes or to human well-being.

But ecosystem services can be delivered by natural, semi-natural and artificial ecosystems

Key aspects to consider

- The notion of a ‘final service’
 - CICES lists ‘potential’ final services.... Context matters
 - Reflects comment by C. Obst:
“Classification...[CICES] should reflect a listing of all ecosystem service types (provisioning, regulating, cultural) irrespective of whether the services are consumed by final users (i.e. economic units) or by other ecosystem assets (intermediate services)”

Key aspects to consider

- The notion of a 'final service'
- The distinction between services, and goods and benefits
- The importance of understanding ecosystem function (>>implications for capacity condition accounts)
- Getting to grips with 'double counting....'
- CICES supports development of indicator frameworks

Capacity and flow indicators...

Table 1

Overview of selected ES, ES indicators and characteristics (section, division, class after CICES 4.3). For indicator choice see Section 2.5.

Section	Division	Class	ES specification	Capacity indicator	Flow indicator	Rivalry
Provisioning	Nutrition	Wild animals and their outputs	Moose hunting	# recruitment $\text{km}^{-2} \text{yr}^{-1}$	# hunted $\text{km}^{-2} \text{yr}^{-1}$	Yes
		Reared animals and their outputs	Sheep grazing	# released $\text{km}^{-2} \text{yr}^{-1}$	# recaptured $\text{km}^{-2} \text{yr}^{-1}$	Yes
	Materials	Fibres and other materials from plants, algae and animals for direct use or processing	Timber harvest	Regrowth $\text{m}^3 \text{ha}^{-1} \text{yr}^{-1}$	Harvest $\text{m}^3 \text{ha}^{-1} \text{yr}^{-1}$	Yes
Regulation and maintenance	Maintenance of physical, chemical, biological conditions	Global climate regulation by reduction of greenhouse gas concentrations	Forest carbon sequestration and storage	Sequ. $\text{Mg C ha}^{-1} \text{yr}^{-1}$ Stored Mg C ha^{-1}	Equals capacity (see Section 2.5/4.2)	Yes
	Mediation of flows	Mass stabilisation and control of erosion rates	Snow slide prevention	Presence of forest land cover on release areas	Presence of forest land cover on release areas if infrastructure in propagation areas present	No

and
land-/seascapes

environmental
settings
Physical use of
land-/seascapes in

Recreational hiking

Density of hiking paths
 km km^{-2}

Density of hiking paths
weighted by users

No

'Sub-classes'

Presence of areas
without technical
interference

Areas > 1 km from
larger infrastructure as
defined by INON

Equals capacity (see
Section 2.5/4.2)

No

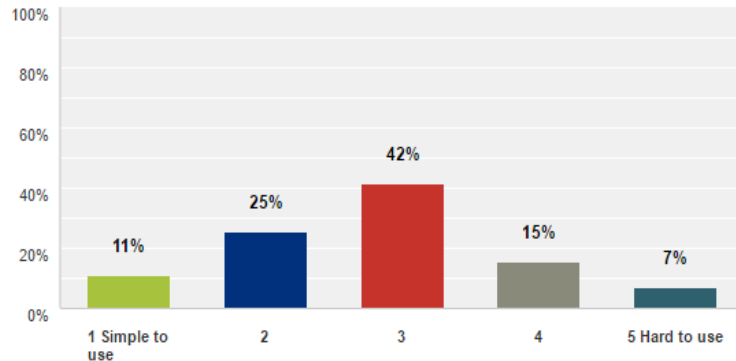
biota,
and
land-/seascapes

The 2016 User Survey

- 222 useable responses (6 weeks up to 1/4/2016)
 - 59% recoded that they were CICES users, and
 - 41% that they were not

Did you find CICES simple or hard to use in your work? Please rate on a scale 1 to 5, where 1 is simple and 5 is hard.

Answered: 118 Skipped: 209



Positive features

- Logical structure
- Hierarchy
- A Standard
- Coverage

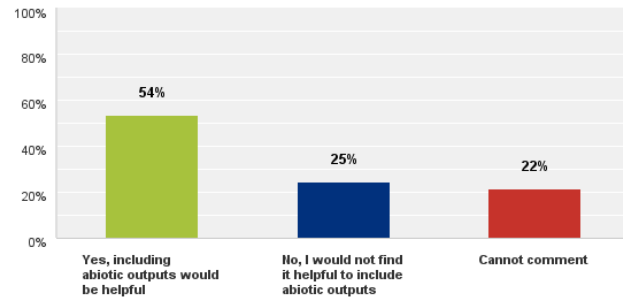
Negative features

- Complexity
- Framing of cultural services
- Clarify terminology

The recent user survey

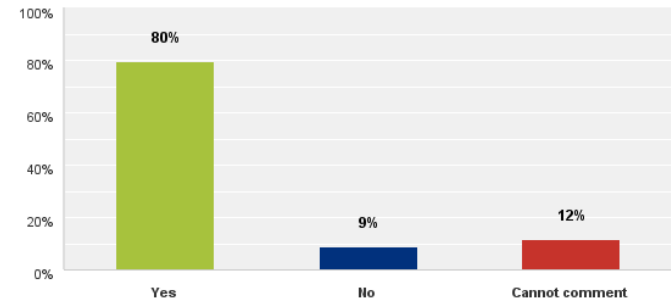
Q13 A number of people have suggested that one way to develop CICES is to include an equivalent classification of the abiotic outputs from ecosystems - to cover such things as wind, hydropower, salt, etc. Do you agree?

Answered: 162 Skipped: 165



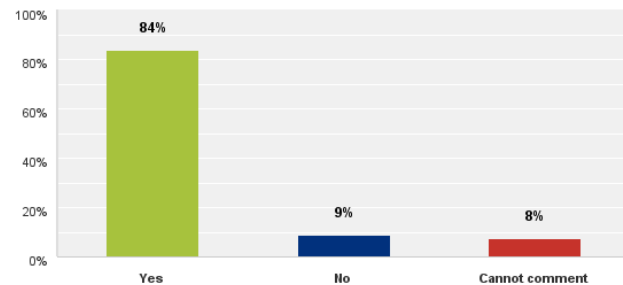
Q14 Should the CICES framework be extended to include examples of ecosystem services in each class type and how they have been measured?

Answered: 161 Skipped: 166



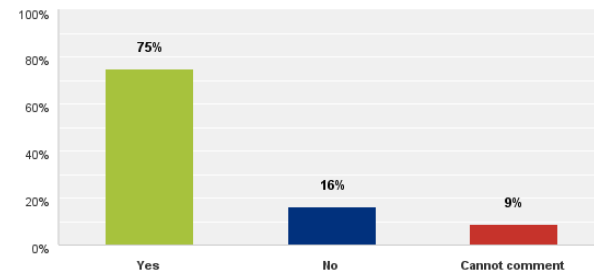
Q15 Should the CICES framework be extended to illustrate the kinds of goods and benefits that services might support?

Answered: 158 Skipped: 169



Q16 Should CICES be developed so that the links between ecosystem services and different types of beneficiary can be identified?

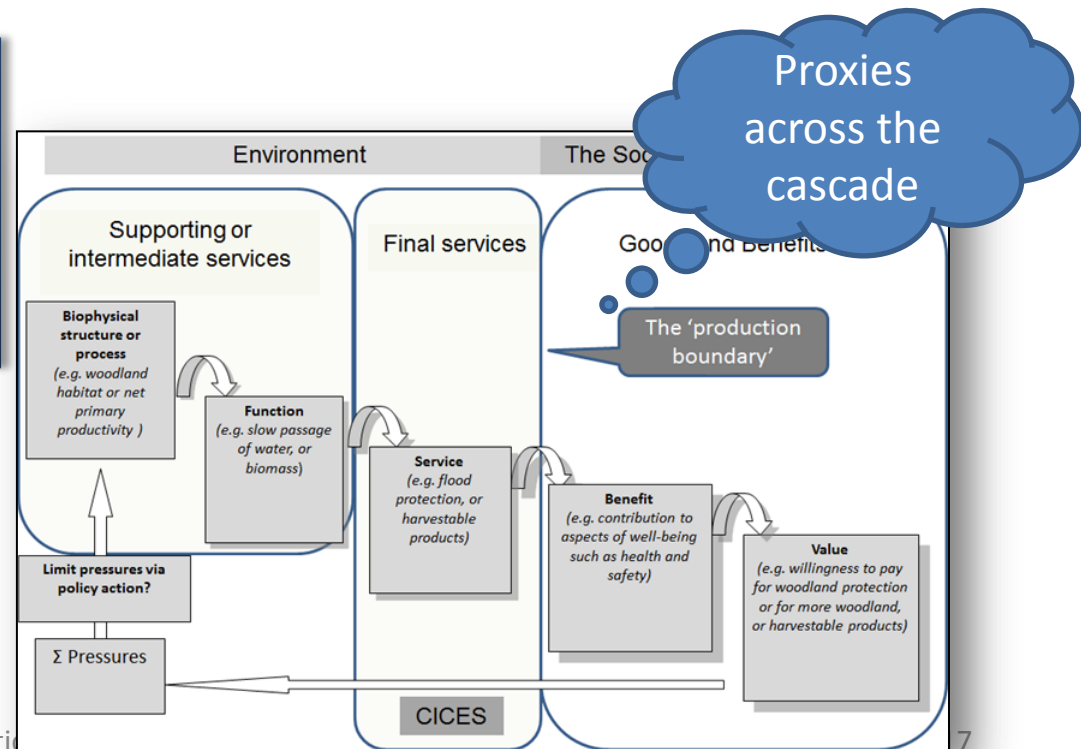
Answered: 158 Skipped: 169



Current status and developments

- Future development:
 - Revision of V4.3 for purpose of ecosystem accounting
 - Guidance (examples and indicator libraries)

EU Funded ESMEALDA Project: Work is currently underway to build a library of CICES consistent indicators



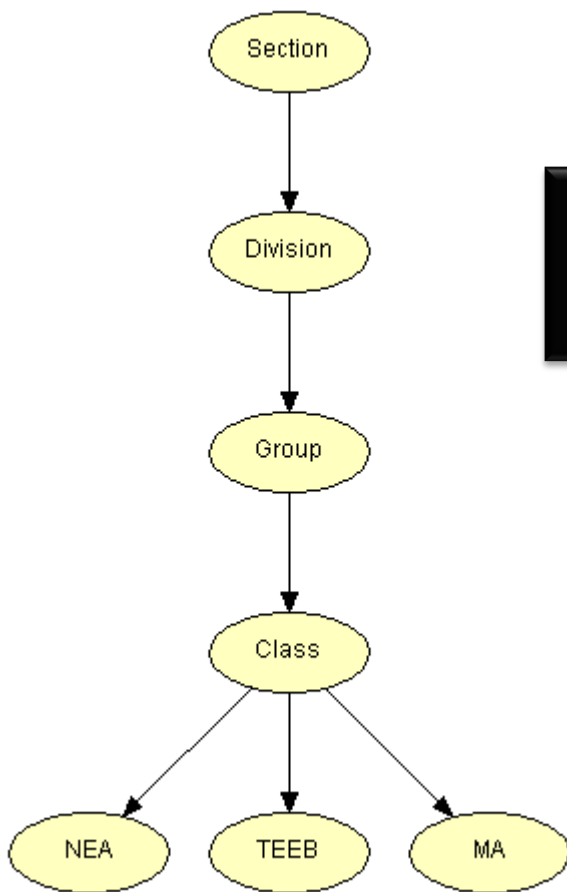
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EU Funded ESMERALDA Project: Work is currently underway to build a library of CICES consistent indicators

- Customisation by ecosystem type/application type
- Links to classifications of benefits and beneficiaries
- Guidance on handling abiotic outputs
- Translator tool now available

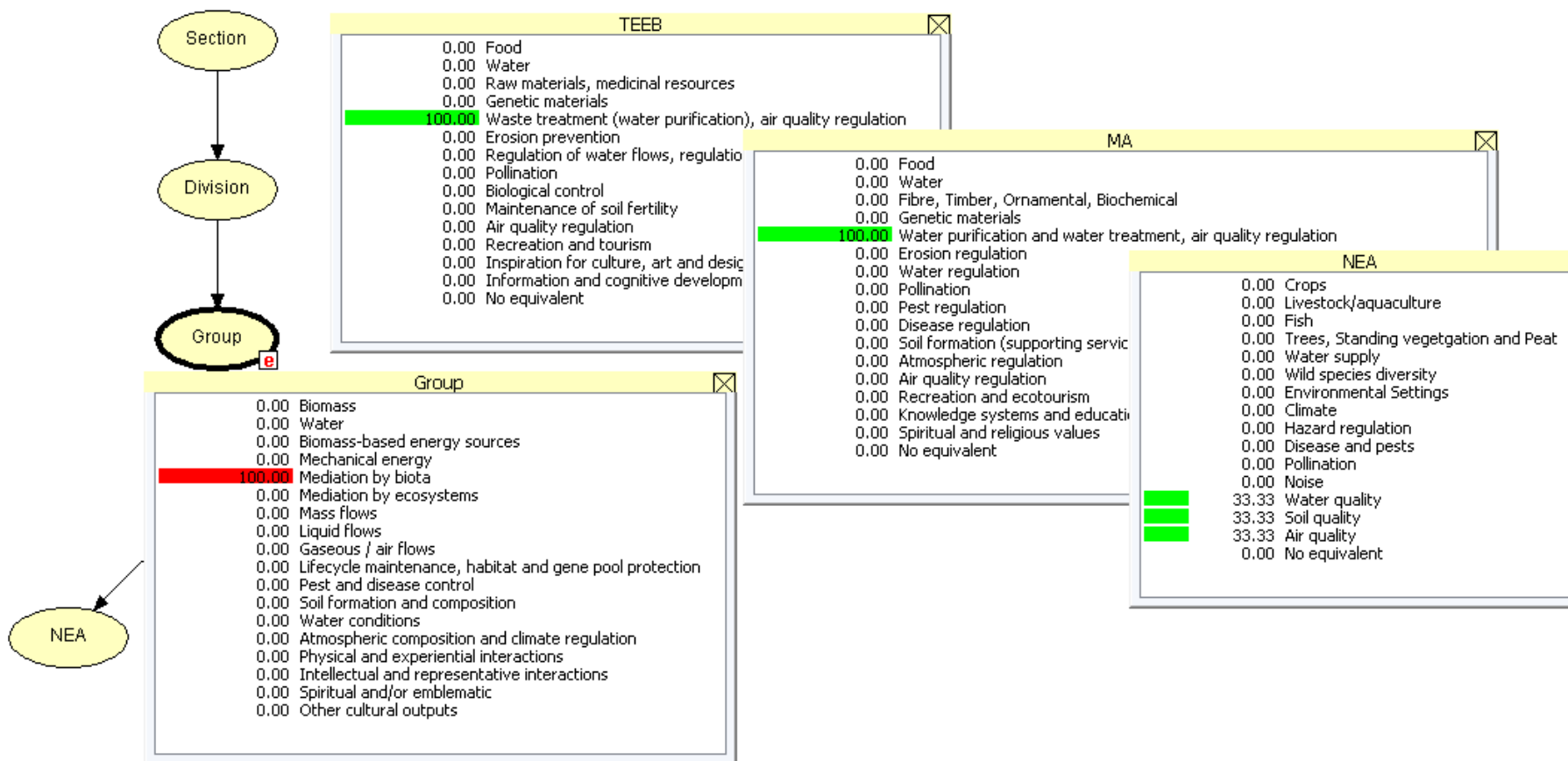
Using CICES to making the links...



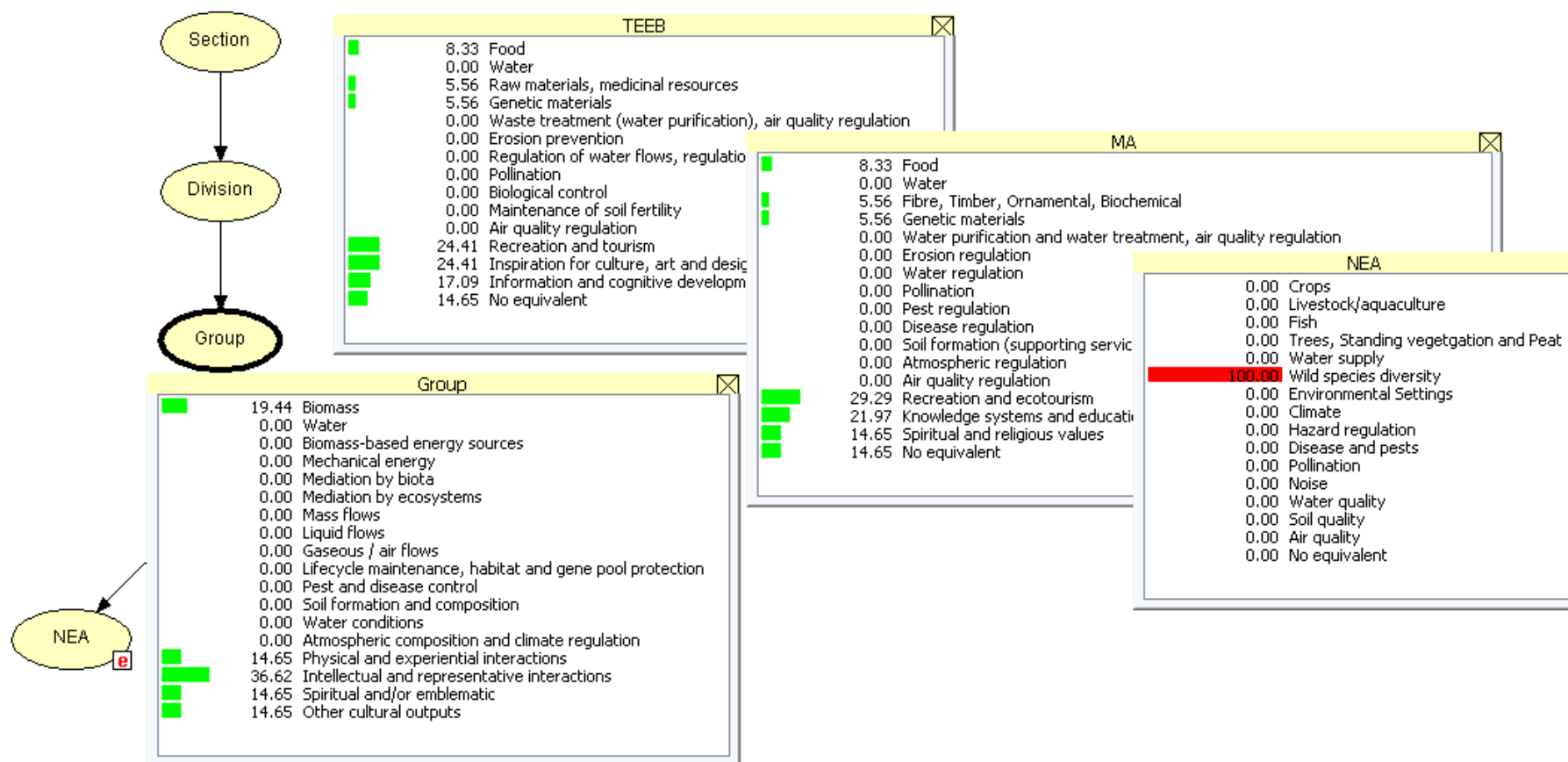
The CLASS level in CICES V4.3 provides a detailed backbone that can be used to build a translator tool using a Bayesian Belief Network

<http://openness.hugin.com/example/cices>

Using CICES to making the links...



Using CICES to making the links...



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- Customisation by ecosystem type/application type
 - Links to classifications of benefits and beneficiaries
 - Guidance on handling abiotic outputs
 - Translator tool now available
- *It is an operational system with a strong user base and we need to take that into account in thinking about the future...*

Thank you.

Contact Roy Haines-Young at:
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