WP 17 - Rerence scheme for RI-RI consultations on roles, relations & interactions of research infrastructures in the biodiversity & ecosystems domain

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1 Executive summary

With increasing importance of large-scale international scientific collaborations, increasing numbers of Research Infrastructures (RIs) need to clarify their relations and interactions with other RIs, for reasons of practical cooperation, strategic purposes, or both. As a result, a range of documents (Letters of Intent, Memoranda of Cooperation or Understanding etc.) have emerged in varying format, content and level of formality. Beside lack of uniformity and compatability between these documents, this process have been hampered by uncertainty how to handle competition and formal problems concerning the procedure, such as mandate and legal status of signatories.

Facing this challenge, the Ecosystem and Biodiversity domain group of ENVRIplus has started the development of a consultation scheme identifying the coarse functional niche of RIs, determining the level of proximity of pairs of RIs via robust “proximity indicators” and finally offering a check list of potential fields of interactions as a basis for Strategic Documents of Cooperation (SDOCs). The approach was detailed and tested by a small group of RIs (LTER, ICOS, AnaEE, Cetaf, AQUACOSM) in a workshop in Vienna in March 2017 on invitation of eLTER H2020.

Work will be continued with the the target of providing a standardized basis for bilateral RI-RI working agreements describing niches (roles & relations) and interactions in a comparable structure, in the biodiversity & ecosystems domain, and beyond.

As next steps, (1) the approach and experiences up to now will be reported and discussed in the BEERi-meeting during the May 2017 ENVRIplus week and (2) pilot SDOCs be elaborated by the testing RIs.

2 Description of work

In various European Research Infrastructures (RIs) in the field of ecosystems and biodiversity such as the ones in the Ecosystem and Biodiversity domain of the ENVRIplus INFRAIA cluster project, clarifying their respective role within the RI landscape and – accordingly – their relations and interactions has been subject of discussions alongside the evolution of numerious RIs over the past decade. Some RIs

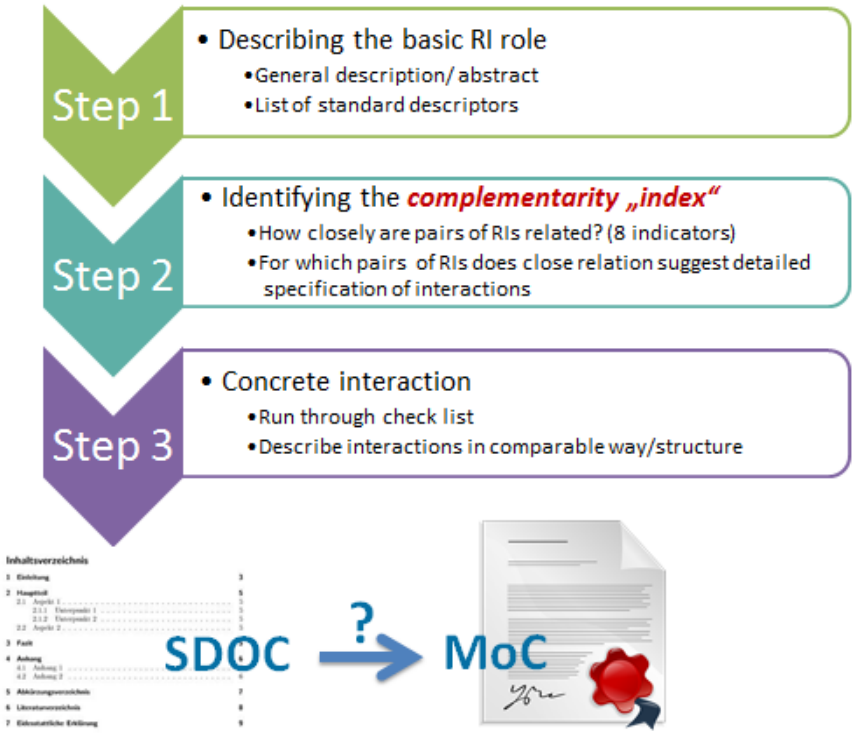
approached the issue by establishing bilateral Memoranda of Understanding (MoU) or Memoranda of Cooperation (MoC) like the LTER-LifeWatch MoC. However, a more systematic approach was lacking up to 2016. In line with discussions about the work programme of BEERi (Board of European Environmental Research Infrastructures in ENVRIplus), an initiative was started by the "Ecosystems and Biodiversity" domain group of ENVRIplus in autumn 2016 to develop such a reference scheme for the domain.

The basic approach was agreed upon during the ENVRIplus consortium meeting in Prague, November 2016 and a draft scheme was finished by the end of 2016. Five existing or emerging infrastructures (eLTER, ICOS, AnaEE, DISCO, AquaCosm) agreed to test the scheme in a workshop organized by LTER in Vienna, 22nd March 2017.

The outcomes of the first test round will be presented at the May 2017 conference of ENVRIplus in Grenoble (France). The target is to apply an agreed scheme to specify the relations of pairs of RIs. The overall aim is to facilitate clarifications relevant at the European scale, possibly serving as basis for strategic recommendations towards complementarity and starting point for more concrete clarifications at the national level in all countries, enabling more efficient resource use and concerted national scientific and science-strategic actions towards better integrated/coordinated national ecosystem RI roadmaps, mirroring European RI strategies.

The outcomes of this exercise will also help to optimize complementary services and synergies for integrated research projects.It will also contribute to shaping the ENVRIPLUS landscape of environmental research infrastructures.

3 Workflow overview



4 RI fingerprint

4.1 Introduction/ general description

“Research Infrastructure A” is… / has the mission to … / offers services to …

text t.b. inserted by RI 1

“Research Infrastructure B” is… / has the mission to … / offers services to …

text t.b. inserted by RI 1

Select any of the following characteristics for each RI to clarify their relative positions and connections.

- Scientific scope (short text/abstract)
- The realm in which the RI operating: terrestrial / freshwater / marine or cross-domain(s).
- Typical user categories.
- How data are collected, stored, processed, and/or used.

Further characteristics are ticked and/or inserted in the check list given in the following table.

Descriptor	LOV (YES=1; NO=0)	Explanation	1_AnaEE	2_LTER	3_AQUACOSM	4_Cetaf	5_ICOSES
Category	fun, sta, for, dat, ind, hio, exa, obs, exp, mon, oth	**dat** -Data management & e-Infrastructure, **for** -Formalisation, **fun** -Funding mechanisms & processes, **ind** -Industry,	Test RIs data				
Abstract		1-2 pages max: Scope, Objectives & Design					
Detailled description		length of e.g. part B of FP7 proposals					
RI type (ESFRI)	central						
RI type (ESFRI)	distributed		1	1	1	1	1
RI type (ESFRI)	e-Infra						
RI type (ESFRI)	Not applicable						
Purpose/aim	Non-invasive research	?necessary					?
Purpose/aim	Monitoring			1		1	1
Purpose/aim	Experiments		1	1	1		
Purpose/aim	Information management		1	1	1	1	1
Purpose/aim	Modeling		1	1	1		1
Purpose/aim	Funding						
Purpose/aim	Other						
Purpose/aim	Other - WHAT	Text field				identificationa	
Key research focus/topic/driver	**Climate**		1	1	1	1	1
Key research focus/topic/driver	**Nitrogen**		1	1	1		0,5
Key research focus/topic/driver	**Other pollutants/ substances**		1	1	1		
Key research focus/topic/driver	Carbon cycle		1	1	1		1
Key research focus/topic/driver	**Biodiversity**		1	1	1	1	0,5
Key research focus/topic/driver	**Invasives**		1	1		1	
Key research focus/topic/driver	**Land use**		1	1			1
Key research focus/topic/driver	Food security		1	1			0,5
Key research focus/topic/driver	Water resources and quality		1	1	1		0,5
Key research focus/topic/driver	Taxonomic references			1		1	
Key research focus/topic/driver							
Key research focus/topic/driver							
Key research focus/topic/driver	Other						

Descriptor	LOV (YES=1; NO=0)	Explanation	1_AnaEE	2_LTER	3_AQUACOSM	4_Cetaf	5_ICOS ES
Category	fun, sta, for, dat, ind, hio, exa, obs, exp, mon, oth	**dat** -Data management & e-Infrastructure, **for** -Formalisation, **fun** -Funding mechanisms & processes, **ind** -Industry,	Test RIs data				
INSERT RESPONSE TO integrated GC system of ENVRI+							
Domain	Terrestrial	any land cover	1	1		1	1
Domain	Freshwater	lakes, rivers, mires, bogs	1	1	1	1	1
Domain	Transitional waters	estuaries, coastal	1	1	1	1	
Domain	Marine (off shore)				1	1	1
Geographical focus	yes/no		no	no	no		yes
Geographical focus	which						Europe
Geographical focus	not applicable					1	
Status	starting	concept stage					
Status	running/ongoing in **2017**						
Status	on ESFRI roadmap	in implementation	1				1
Status	permanent						1
Status	finished						
Status	unknown						
Status of development as European RI	concept						1
Status of development as European RI	project				1		1
Status of development as European RI	under development outside ESFRI			1		1	
Status of development as European RI	on ESFRI roadmap		1				1
Status of development as European RI	permanent			1		1	1
Status of development as European RI	permanent as legal entitiy (ERIC, AISBL...)						1
Status of development as European RI	finished/ terminated						
Status of development as European RI	unknown						
Starting year			2012	2007	2017	1996	2006
End year							
Duration	short-term	1-5 years			1		
Duration	mid-term	5-10 years					
Duration	long-term	>10 years	1	1		1	1
Duration	unknown						

Descriptor	LOV (YES=1; NO=0)	Explanation	1_AnaEE	2_LTER	3_AQUACOSM	4_Cetaf	5_ICOSES
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Funding mechanism	FP6						
Funding mechanism	FP7						
Funding mechanism	H2020			1	1		
Funding mechanism	Life+						
Funding mechanism	ESF						
Funding mechanism	ERIC, association,....	based on member fees and RI-intrinsic mechanisms				1	1
Funding mechanism	national		1				12
Funding mechanism	distributed sources	e.g. LTER					1
Funding mechanism	other						
Funding mechanism	Not applicable						
Funding period	number of years		2		4		5
Funding period	indefinite			1		1	1
Funding period	unknown						
Funding period	Not applicable						
Is in-situ infrastructure	yes/no	has OWN in-situ component for data gathering	1	1	1		1
Is in-situ infrastructure	unknown						
Number of sites/ distributed elements		if element is a network of in-situ infrastructures	150	400	37	60	100
Number of sites/ distributed elements	Not applicable						
Number of sites/ distributed elements	unknown						
Scale of the network	global			1			0,5
Scale of the network	European		1		1	1	1
Scale of the network	national						
Scale of the network	local						
Scale of individual sites	1-10.000 m2	plot/ aquatic sites area	1	1	1		
Scale of individual sites	1-100 ha	site/ aquati sites area		1			1
Scale of individual sites	1 km2- 10 km2			1			
Scale of individual sites	10 km2-1000 km2			1			
Scale of individual sites	>1000 km2			1			
Scale of individual sites	unknown						
Scale of individual sites	Not applicable					1	

Descriptor	LOV (YES=1; NO=0)	Explanation	1_AnaEE	2_LTER	3_AQUACOSM	4_Cetaf	5_ICOSES
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Number of institutions signed science case	Number		30	120	21	75	100
Number of institutions signed science case	Not applicable						
Number of institutions signed science case	unknown						
Number of institutions formally committed members	Number		8	11	21	33	100
Number of institutions formally committed members	Not applicable						
Number of institutions formally committed members	unknown						
Number of countries in the broader network	Number		12	27	12	22	20
Number of countries in the broader network	Not applicable						
Number of countries in the broader network	unknown						
Number of countries in the actual RI development	Number		5	11	12	9	12
Number of countries in the actual RI development	Not applicable						
Number of countries in the actual RI development	unknown						
Coordinating person	name		x	x	x	x	x
Coordinating person MAIL	email						y
Coordinating INSTITUTION							
Coordinating INSTITUTION	Not applicable						
Coordinating COUNTRY							
Coordinating COUNTRY	Not applicable						
WEB-link							
Latest weblink update (NEWS, EVENTS)							
Element described by		to indicate person providing the information here (might not be the coordinator)					

4.2 Positions in the biodiversity & ecosystems RI landscape

The biodiversity and ecosystem meeting in ENVRIPLUS agreed on a simple map allowing to position the research infrastructure with its primary objective and operations, and to clarify their interconnections.

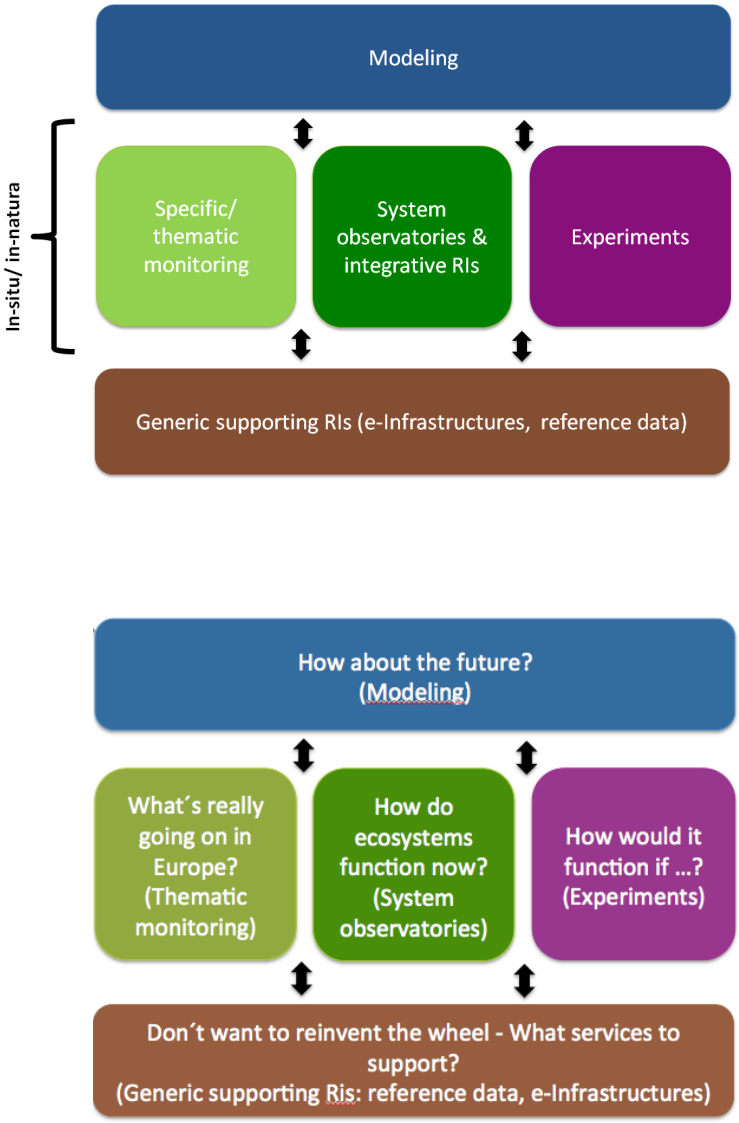

Figure: The position of the two research infrastructures can be visualized in this diagram.

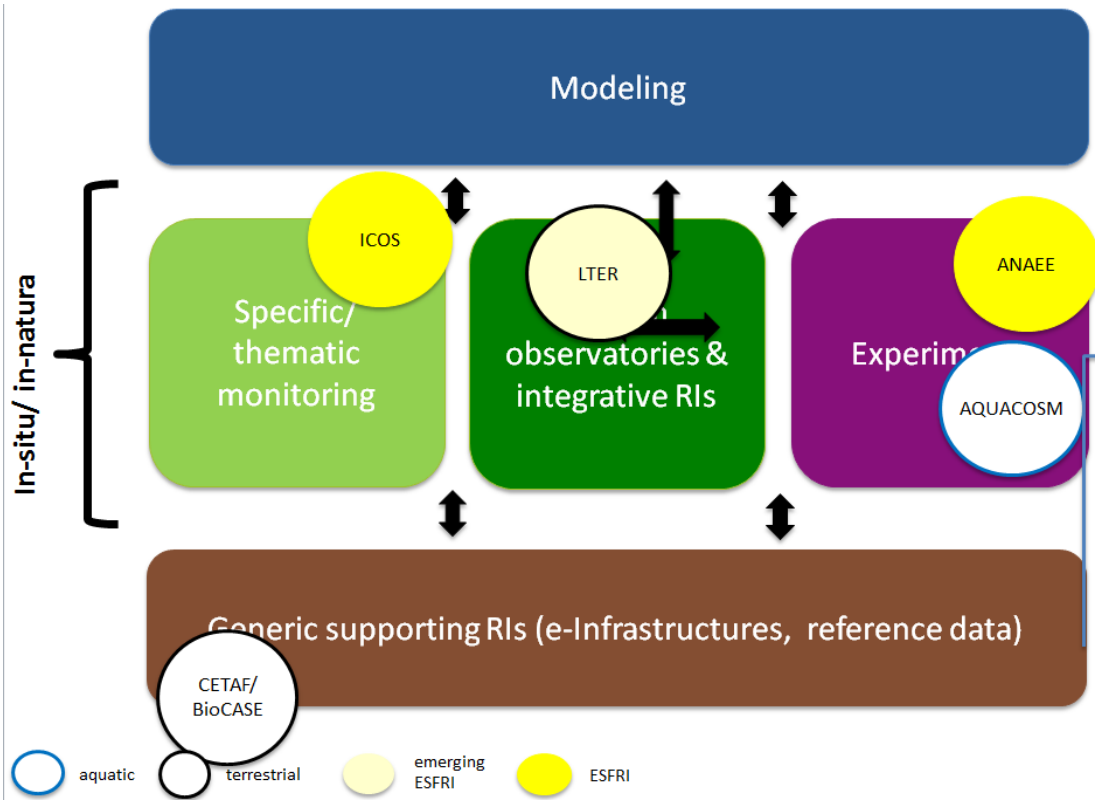

Figure: Position of the 5 testing RIs

5 Proximity indicators (from the check list)

The following indicators link the RI and RI-RI-relation profiling from the consultation scheme:

- Co-location of in-situ sites
- Added value of joint/complementary site use and (further) design
- Complementarity to achieve shared overall aims
- Integrated RI building strategy (national, international)
- Intercalibration, intercomparability enabling data exchange
- Necessary best practice exchange, e.g., methods, design...
- Shared scientific scope
- What is the principal nature of added value? [former "interdependency"]

The following table provides the sugggested/tested classes/categories for these attributes.

Co-location of in-situ sites		
Co-location of in-situ sites	no	potential co-location at the site level at the European scale
	1-25%	
	25-50	
	50-75	
	75-100	
	not applicable	
Shared scientific scope		
Shared scientific scope	no	Should either not overlap too much (--> shareholders), but on the other side it does make sense to approach the same topic with different methods. PROBLEM: this question has various dimensions
	0-25%	
	25-50	
	50-75	
	75-100	
	not applicable	
Added value of joint/complementary site use and (further) design		
Added value of joint/complementary site use and (further) design	not applicable	in terms of what is done/doable at the sites (site design...).... co-location issues
	minor importance	
	relevant	
	very relevant	
	crucial	
Complementarity to achieve shared overall aims		
Complementarity to achieve shared overall aims	not applicable	
	minor importance	
	relevant	
	very relevant	
	crucial	

Integrated RI building strategy (national, international)		
Integrated RI building strategy (national, international)	not applicable	
	minor importance	
	relevant	
	very relevant	
	crucial	
What is the principal nature of added value? [former "interdependency"]		
What is the principal nature of added value? [former "interdependency"]	There is no interdependency (strict or principal)	
	DIRECT (immediate mutual added value/ dependency)	allow for some text
	Indirect, principal long-term dependency in terms of interacting realms/domains	allow for some text
Necessary best practice exchange, e.g., methods, design...		
Necessary best practice exchange, e.g., methods, design...	not applicable	technical capabilities, ?interoperability
	minor importance	
	relevant	
	very relevant	
	crucial	
Intercalibration, intercomparability enabling data exchange		
Intercalibration, intercomparability enabling data exchange	not applicable	
	minor importance	
	relevant	
	very relevant	

6 Specifying interactions

In the last step, interactions are further specified as a basis for a Standard Document of Collaboration (SDOC)

6.1 Basic aspects

- Shared scientific scope
  - What are the major common research topics and scientific targets requiring RI-RI interaction
  - Has to be at a high level, e.g. N-fluxes and impact/Eutrophicatoin

- What is the principal nature of added value? [former "interdependency"]
  - Expand on the following options:
    - There is no evident mutual added value (strict or principal)
    - DIRECT (immediate mutual added value~~dependency~~: e.g. direct collaboration in e.g. education, standardization…, jointly used tools, complementary data)
    - Indirect, principal long-term mutual added value~~dependency~~ in terms of interacting realms/domains (e.g. reference lists)
  - Other aspects

- Complementarity to achieve shared overall aims/purposes of the RI
  - What are the main aspects of complementarity (?short narrative/text block)

- Policy/ strategy
  - Check integrated RI building strategy aspects
    - national (e.g.. Cooperation of national RI nodes in countries.
    - European
    - international
  - Is there a common (European, national) funder/ funding mechanism, which needs to be approached by both?
  - Promoting the participation of European countries in each RI an issue?
  - What are the shared high-level end users?
  - What is the added value of the envisaged RI-RI interactions (below) for the shared high-level end users?

6.2 Potential cooperative activities

- Scientific aspects
  - themes to be developed jointly
  - harmonization of scope in selected fields
  - scientific joint projects?
  - common scientific communities to be supported/considered

- In-situ infrastructure
  - Co-location of sites
  - Added value of joint/complementary site use and (further) design
  - Equipment sharing or integration (which RI builds on what?)

- Interoperability (except data)
  - Is there common, free and open access?
    - physical/ remote
    - virtual (→ see also data, below)
    - obstacles to be tackled?
  - Fostering the use of common standards and protocols
  - Intercalibration issues
  - Deploying the ENVRI Reference Model for identifying other key relations

  - Joint sensor development
  - Other activities enhancing RI interoperability

- Data and data related services/tools
  - Joint use of data and tools
    - in general
    - are there already dependencies in any direction?
  - Joint planning of data mobilization
  - Data formats, licenses
  - Development of joint demand-driven data discovery
  - (Joint) development of support tools to assist users
  - Joint strategy for data citation

- RI users and user support
  - Cross check of RI specific user groups
  - Coordinated/ Joint / integrated access policy, and/or users access
  - Collaborative services to specific user groups; business opportunities
  - More specifically: potential joint interactions with industry (products..)?
    - upstream (e.g. sensor development)
    - downstream (e.g. usage of RI data by industry)

- Education/ Training
  - Exchange of staff
  - Joint training offerings
  - Harmonized staff career plans
    - what are the common job profiles?
    - what are the related training requirements?
    - is working in a/the RI valorizing the kind of work and are there sufficient incentives?
  - Necessary best practice exchange, e.g. methods, design...
    - within the RIs
    - at the interface with e.g. user communities, academic institutions

- Concrete action(s) related to joint policy and strategy
  - Check integrated RI building strategy aspects
    - national (e.g. Cooperation of national RI nodes in countries.)
    - European
    - international
  - Actions at the interface withz common (European, national) funder/ funding mechanism, which need to be approached by both?
  - Joint prospective WS to convince funders of harmonized calls on selected subjects of relevance for the RIs
  - Securing appropriate coverage of RIs across European countries: Is promoting the participation of European countries in each RI an issue?

6.3 Summary – Added values and relations

Provide a short description on the relations as typical for the two RIs (added value, dependencies, connections), for example as follows.

- Infrastructure A depends on B with respect to … (data, sites, equipment, software, etc).
- The related requirements are …

- Both RIs want to cooperate together on the following topics …
- The RIs both want to engage (together) in … (users access, service development, policy outreach, etc).
- Other relations.