Institut de Ciències del Mar

UKEOF
ENVIRONMENTAL OBSERVATION FRAMEWORK

Using Social Media as a Data Source for Environmental Science
9 December 2020

Conservation culturomics and iEcology in a recreational fishing context:

Use of digital data mined from YouTube and how they can be used to better understand the human dimension of recreational fishers

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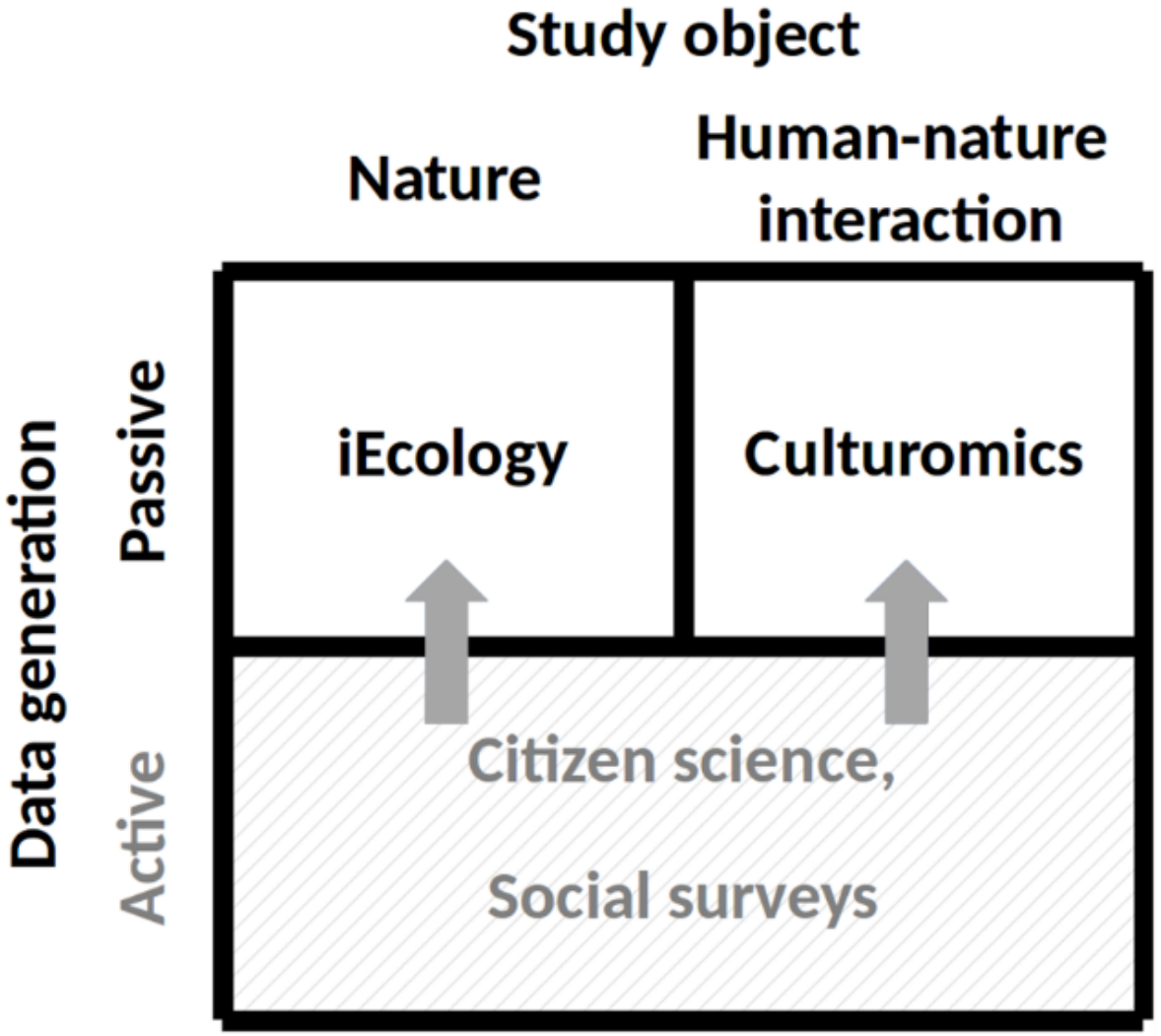
Citizen Science *VS* Culturomics & iEcology



Jaric et al. 2020 *Plos Biol*

The emergence of conservation culturomics and iEcology

Culturomics

The study of human culture through the quantitative analysis of large bodies of digital data

Conservation culturomics

The study of problems in conservation through the prism of human–nature interactions (e.g., attitudes of stakeholders and general public)

iEcology

The study of ecological processes using digital data generated for other purposes (e.g., distributional range shifts)

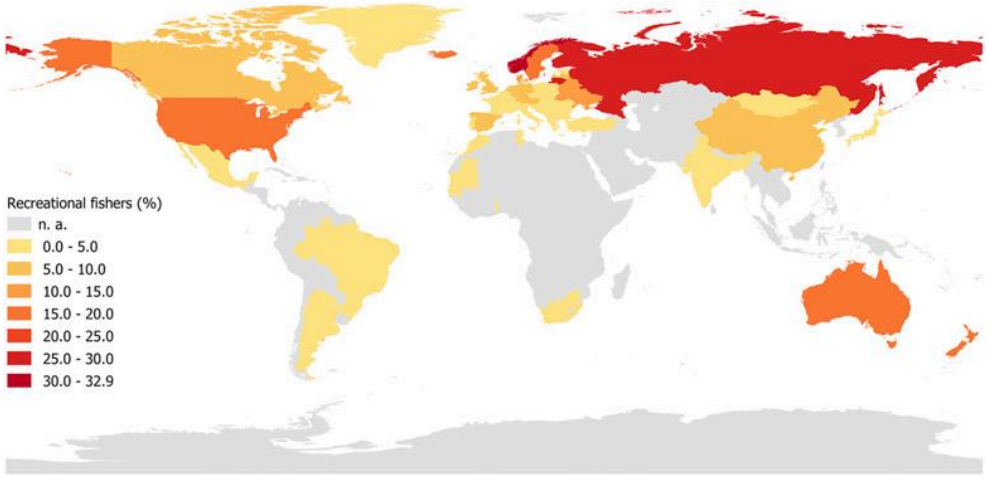
Michel et al. 2011 *Science;* Ladle et al. 2016 *Front Ecol Environ*; Jaric et al. 2020 *Trends Ecol Evol;* Jaric et al. 2020 *Plos Biol*

Social media and some figures about YouTube

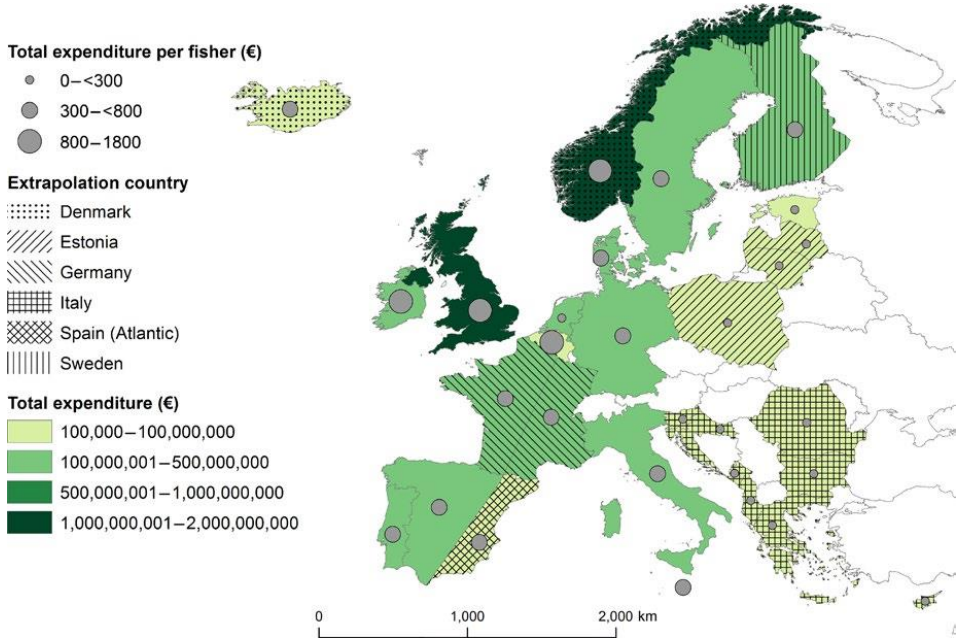
- YouTube is the second most visited website in the world
- 1 billion hours of videos are played every day
- 80 different languages
- 90 different countries

Source: *YouTube Statistics 2020*

Recreational fishers



- 5 times > commercial fishers
- Human dimension

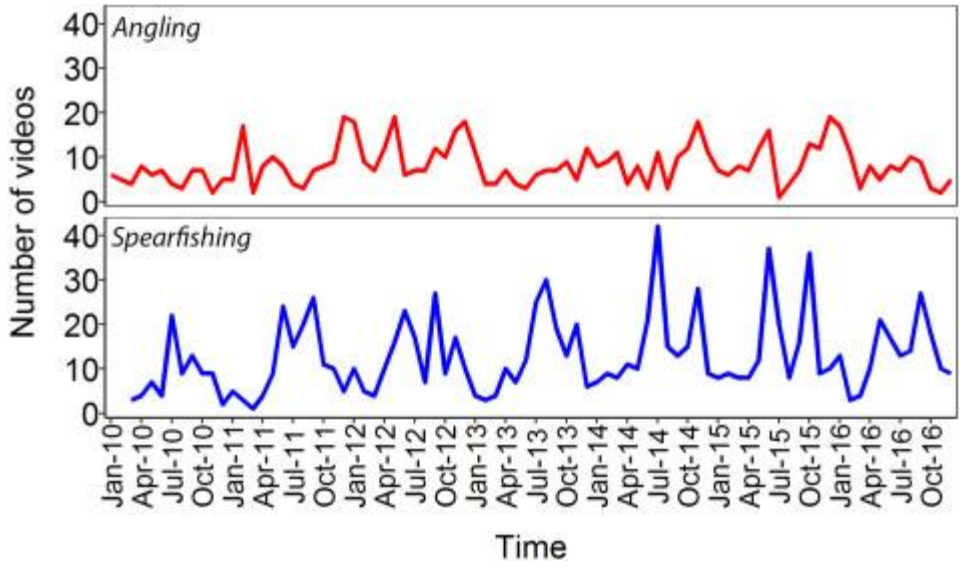


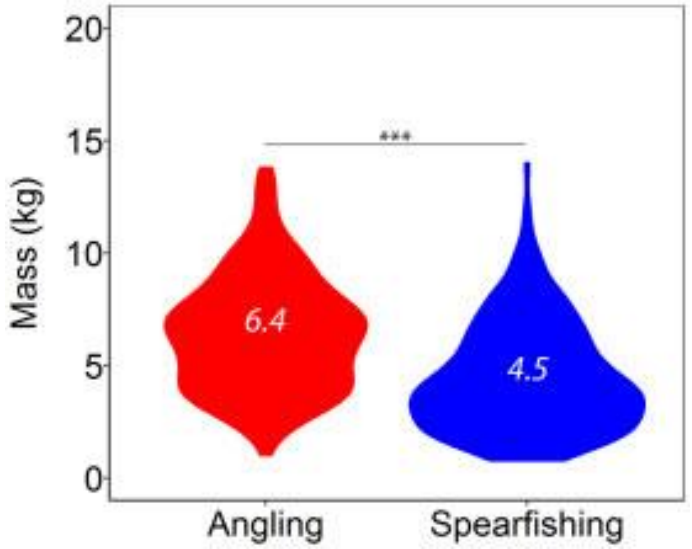
Europe

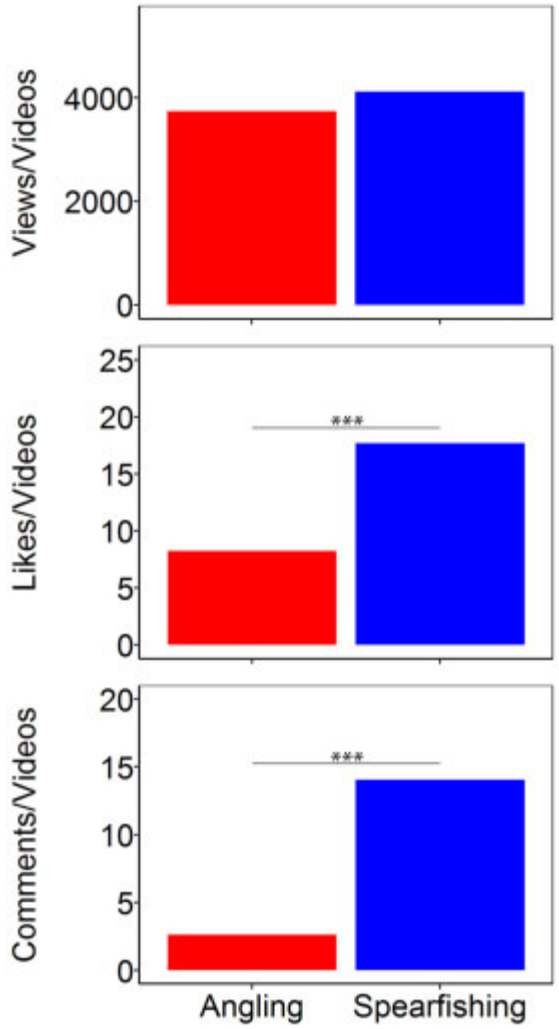
- 8.7 million
- € 5.9 billion annually

Arlinghaus et al. 2019 *PNAS;* Hyder et al. 2018 *Fish and Fish*

A case study about conservation culturomics







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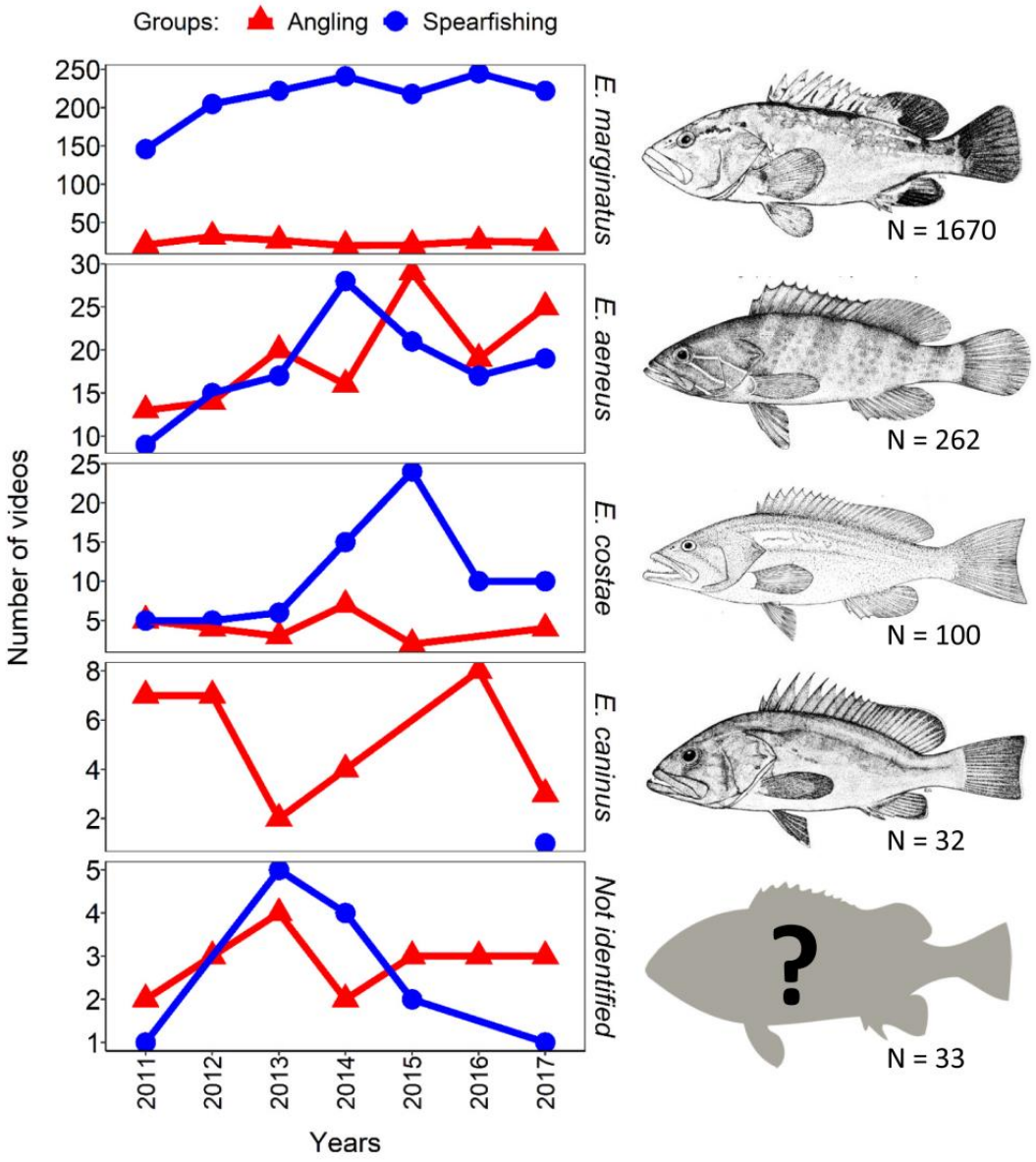
A case study about conservation culturomics

Subject	Category	Subcategory	Dimension	Theme	Angling	Spearfishing
	Advice	Request	Neutral	Asking advice about fishing strategy	3.5	1.5
Fisher	Opinion	Give	Positive	Appreciation for athletic performance	–	2.4
			Positive	Appreciation for fishing skills	0.5	**10.2**
			Positive	General appreciation for the fisher	**22.4**	**30.3**
			Negative	Criticism related to the declared mass	1.0	–
			Negative	Criticism related to the fishing behaviour	0.5	–
	Responses	Agree	Positive	Agreement with previous comment	2.0	8.4
			Neutral	Reply to previous comment	6.0	**8.6**
	General conversation	Greetings	Positive	General greetings	4.0	6.9
		Joke apology	Positive	Joke regarding the fishing skills	**7.5**	1.8
		Request personal information	Neutral	Asking personal information	0.5	1.7
Fish	Opinion	Give	Positive	Appreciation for fish size	**10.0**	**10.5**
			Neutral	Opinion on fish behaviour	1.0	1.2
			Neutral	Opinion of fish conditions	0.5	–
			Negative	Criticism related to kill a fish	0.5	–
			Negative	Criticism related to kill the prey immediately	1.0	–
Technology	Opinion	Give	Positive	Appreciation for gear used	1.0	0.3
			Negative	Criticism on the type of gear used	1.0	0.5
			Neutral	Asking advice about the type of gear used	3.5	1.2
Others	Opinion	Give	Positive	Appreciation for the environmental context	1.5	1.4
			Positive	General appreciation for the video	**19.4**	**9.2**
			Neutral	Opinion on the quality of the video	–	0.3
			Negative	Criticism towards pollution and commercial fishing	2.5	0.3
	Expression of personal feelings	Positive	Positive	Expression personal feelings on the video	**7.5**	1.4
	General conversation	Anecdote	Neutral	Fishing anecdote	1.5	0.9
	Site process	Profiles and subscriptions	Positive	Declared submission to the channel	0.5	1.2
	Non-response comments	Nonsense words/random	Neutral	Non-interpretable comments	1.0	–

The most frequent five themes are indicated in bold for each group.

Sbragaglia et al. 2020 *ICES J Mar Sci*

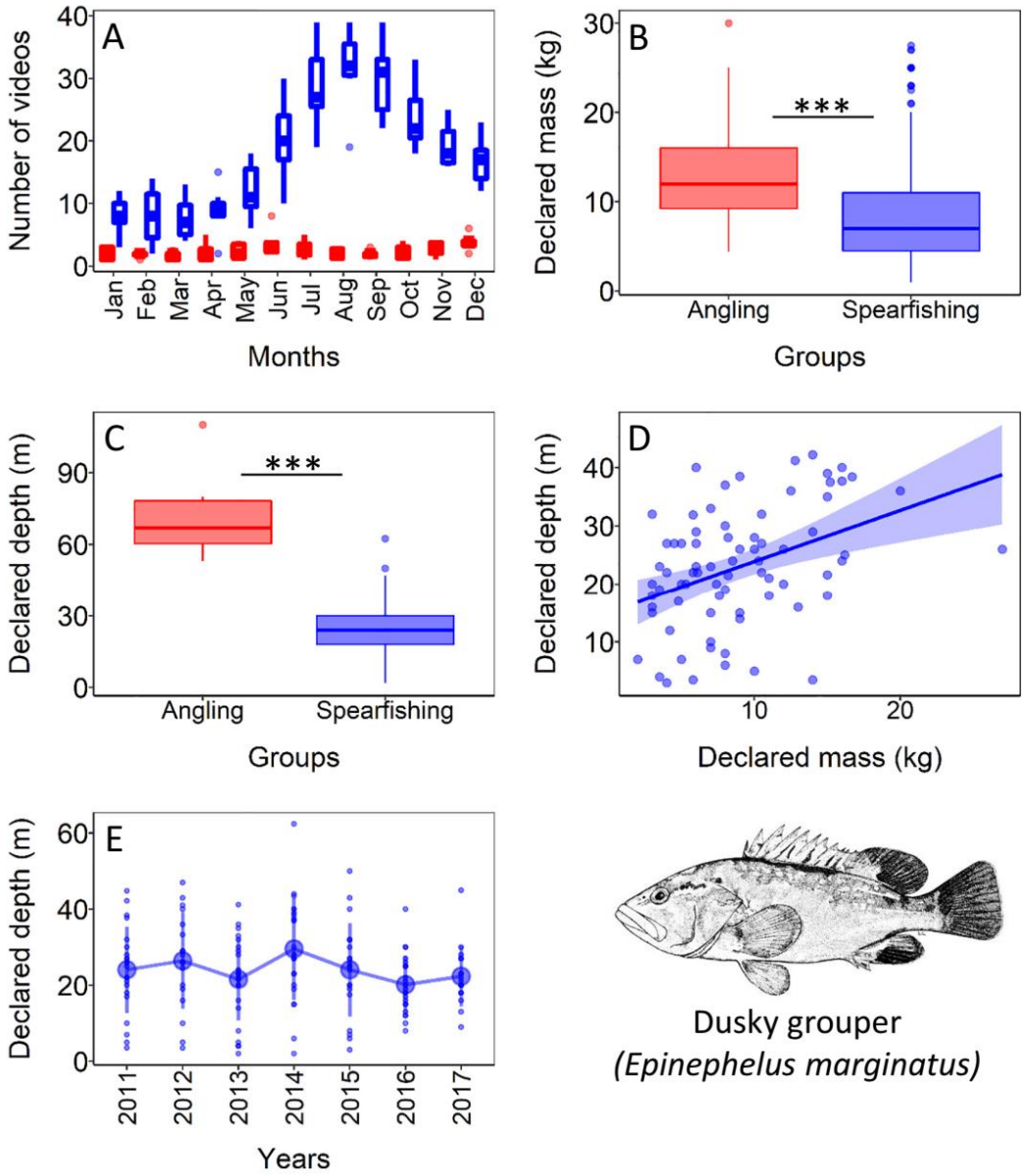
A case study about iEcology of groupers



Species	Intrinsic vulnerability index	IUCN status (Mediterranean)
Dusky grouper (*E. marginatus*)	72/100	Endangered (EN)
White grouper (*E. aeneus*)	52/100	Near threatened (NT)
Goldblotch grouper (*E. costae*)	66/100	Data deficient (DD)
Dogtooth grouper (*E. caninus*)	87/100	Data deficient (DD)

Sbragaglia et al. in press *Sci Tot Envin*

A case study about iEcology of groupers



Dusky grouper
(Epinephelus marginatus)

Ontogenetic deepening

the pattern that older and larger fish are found in deeper waters compared with smaller and younger individuals that remain shallower.

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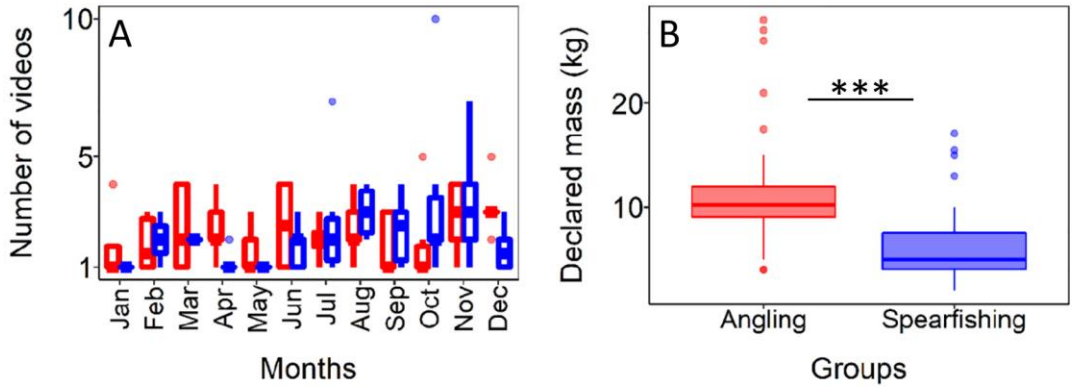
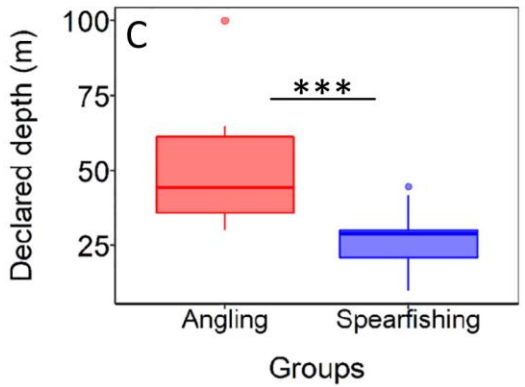
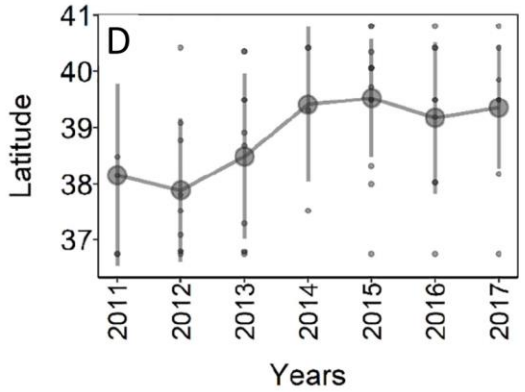
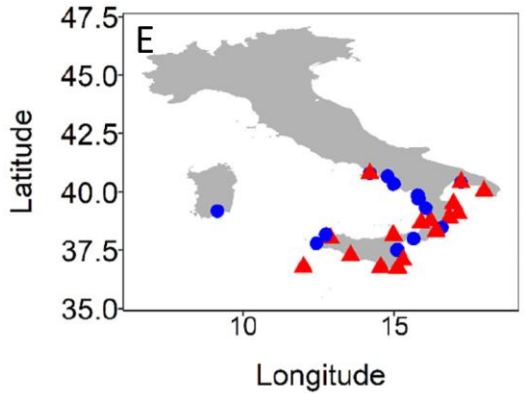
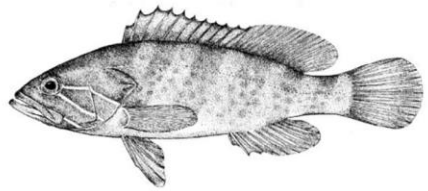
A case study about iEcology of groupers







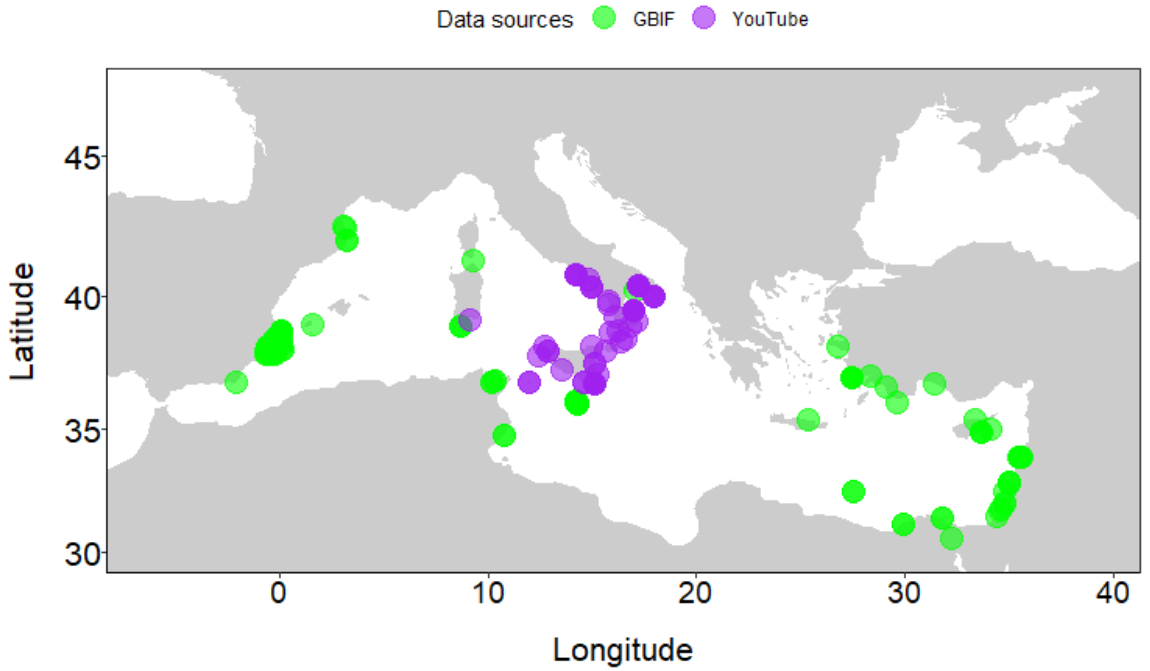




White grouper
(Epinephelus aeneus)

Distributional range shift

In the Mediterranean Sea many species are now moving to the north due to climate change



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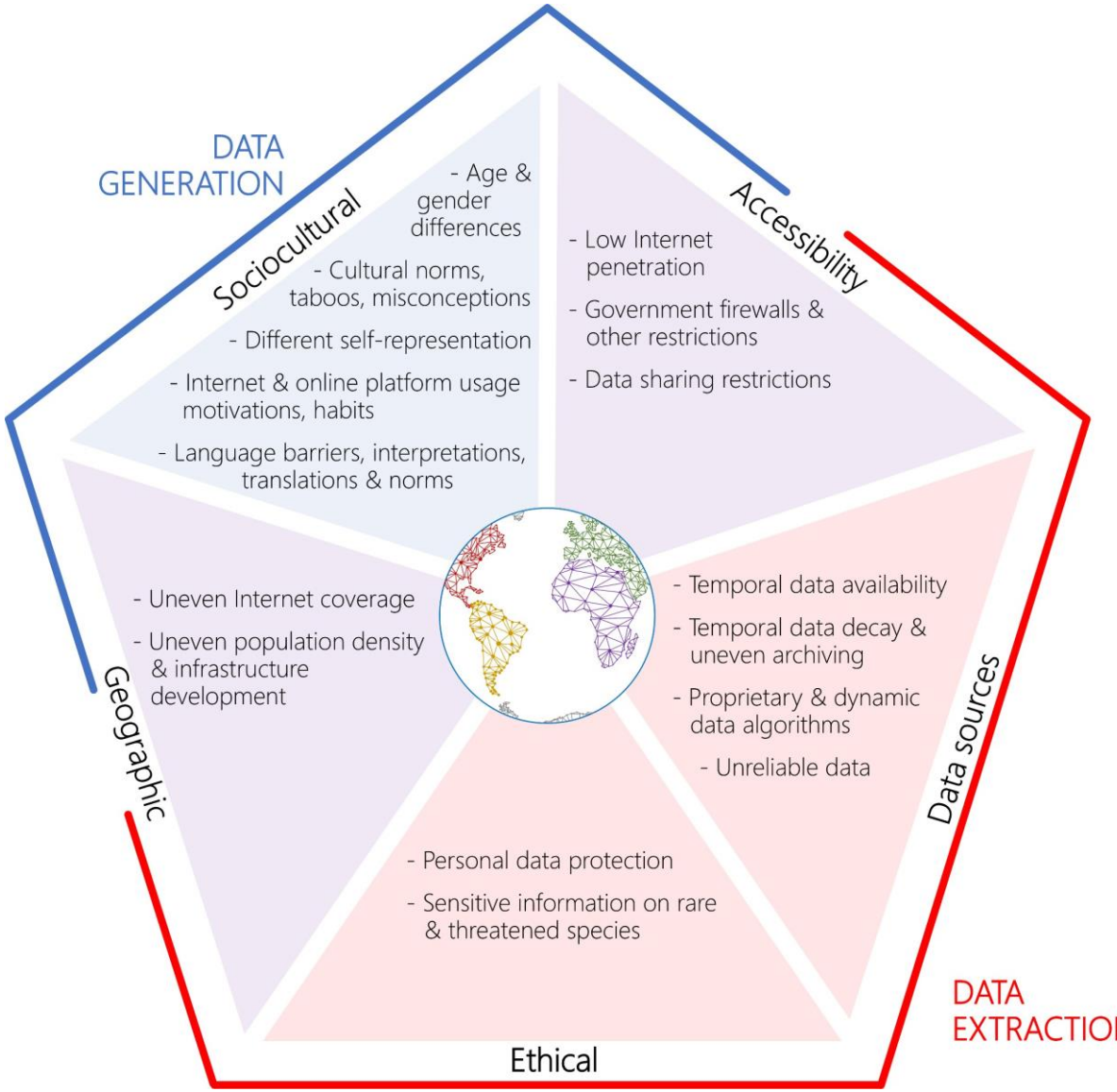
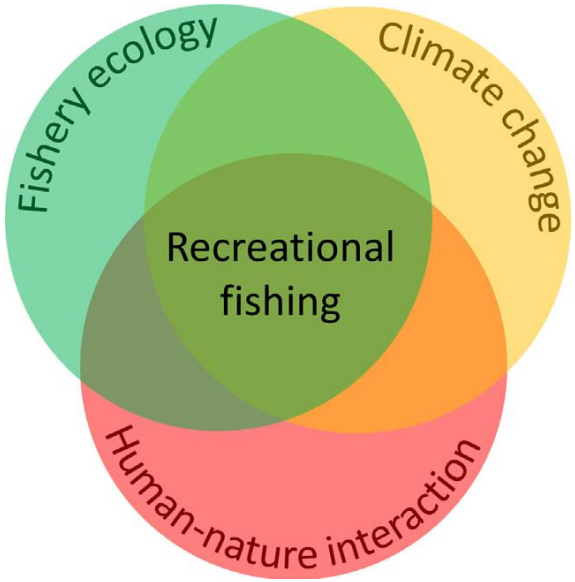
Limitations of conservation culturomics and iEcology



Jaric et al. 2020 *Plos Biol*

Take home messages



- Low sampling costs and high spatiotemporal breadth
- Explorative studies for areas where resources are limited
- Strong potential for comparative studies (angling vs spearfishing)
- Promising monitoring tool (once limitations are addressed)

Acknowledgments

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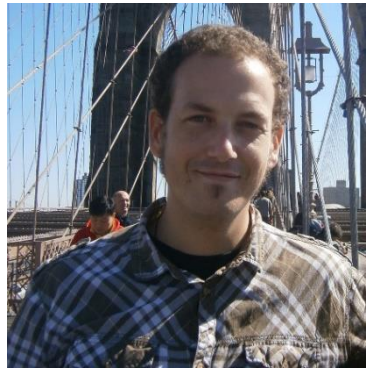

R. Arlinghaus

IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries

Leibniz Association

DAAD Deutscher Akademischer Austauschdienst German Academic Exchange Service

Přírodovědecká fakulta Faculty of Science — Jihočeská univerzita v Českých Budějovicích University of South Bohemia in České Budějovice