

European standards for initial training in **occupational scientific diving**,
a necessity, and a guarantee for the mobility of scientists
and effective research in the coastal environment

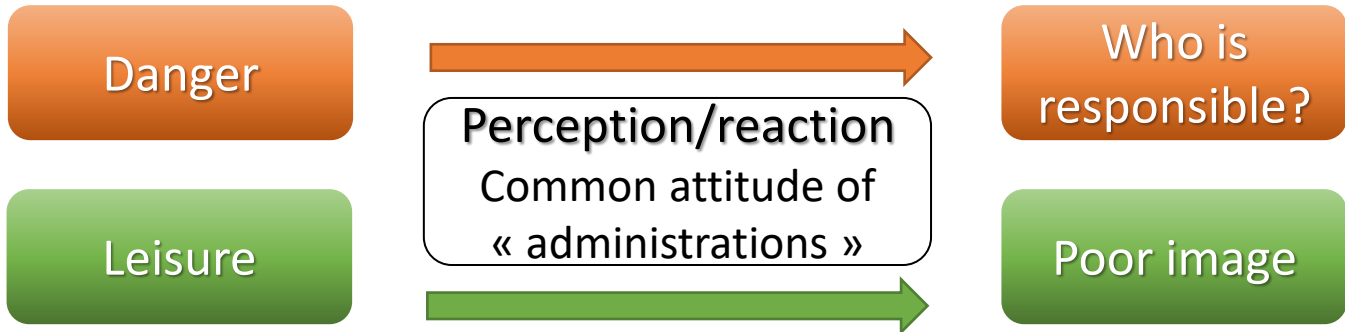


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Is it easy to dive for Science in EU?



Consequence

Diving could become difficult or impossible

During the late 1970s, when they began considering the problem, the reflex of administrations was to **bann** or **link Scientific Diving (SD) to commercial diving**
Depending on the countries, the use of SD may still be difficult if not impossible as an occupational activity

There is a need to have *scientific diving* recognized by law

A problem at a European scale → the **subsidiarity principle** of the law.

There is no common European education policy → responsibility of the member states *de facto* national diplomas

→ *Diving, even scientific diving, is not a priority at EU level*

→ *Setting up of an effective system of equivalence of qualifications* (training level and certificates issuance) to guarantee mobility of scientists and must be agreed upon by (all) member states.

→ *Self-organization of the community of scientists* using diving as a working tool inside a patchwork of very different legal situations

→ *Aiming at recognition of Occupational Scientific Diving (OSD) and promulgation of compatible national laws (common reference = standards)*

What is Occupational Scientific Diving (OSD)?

A precise definition of this type of Diving is needed.

- OSD is science-led and in support to professional research and education, such as protecting, conserving, and monitoring the natural and cultural heritage environment.
- Operated as a work activity, OSD is not to be confused with recreational or commercial diving
- OSD exists in a health and safety framework that involves:
 - *certified scientific divers,*
 - *diving officers,*
 - *hyperbaric physicians,*
 - *scientific project leaders,*

As well as

- *heads of scientific laboratories,*
- *administrators,*
- *and legislators.*



MAST III, a European Union R&D (DG XII)



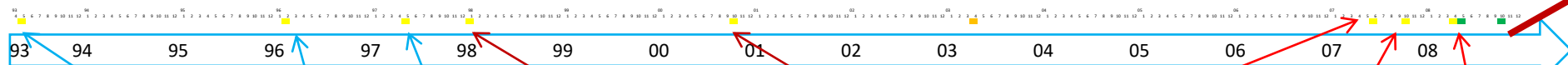
Technical committee



Kommission Forschungstauchen Deutschland KFT



EUROPEAN SCIENCE FOUNDATION



Brussels workshop

Brussels workshop

Elba training course

1

Brussels workshop

Banyuls-sur-Mer workshop

2

Berlin workshop

Bremerhaven symposium

Marseille workshop

3

first drafts

Standards' improvement

European agreed Standards

Application to become an ESF panel



National Committees / NSDCs



2008-2011



2011-2017



Since 2017

The European Scientific Diving Committee, an initiative of DGXII 1988 (renewed in Berlin in 2007), became a panel of the Marine Board in 2008. Since 2017, it's a panel of the European Marine Station Network-MARS www.marinestations.org/esdp/

BELGIUM (BELSPO, FNRS, FWO)

CROATIA (IZOR, IRB)

DENMARK (DTU Aqua)

ESTONIA (ETA)

FRANCE (CNRS, IFREMER, Marine Universities *RUM* {16+MNHN})

GERMANY (KDM, GEOMAR)

GREECE (HCMR)

IRELAND (Marine Institute, Marine universities *IMUC*)

ITALY (CNR, OGS, CoNISMA, SZN)

THE NETHERLANDS (NIOZ, DELTARES)

NORWAY (IMR, RCN, NMUC)

POLAND (IO PAN)

PORTUGAL (CIMAR, FCT)

ROMANIA (RBRC)

SPAIN (IEO, CETMAR)

SWEDEN (UGOT)

TURKEY (TÜBITAK)

UNITED KINGDOM (MASTS, NERC, NOC)

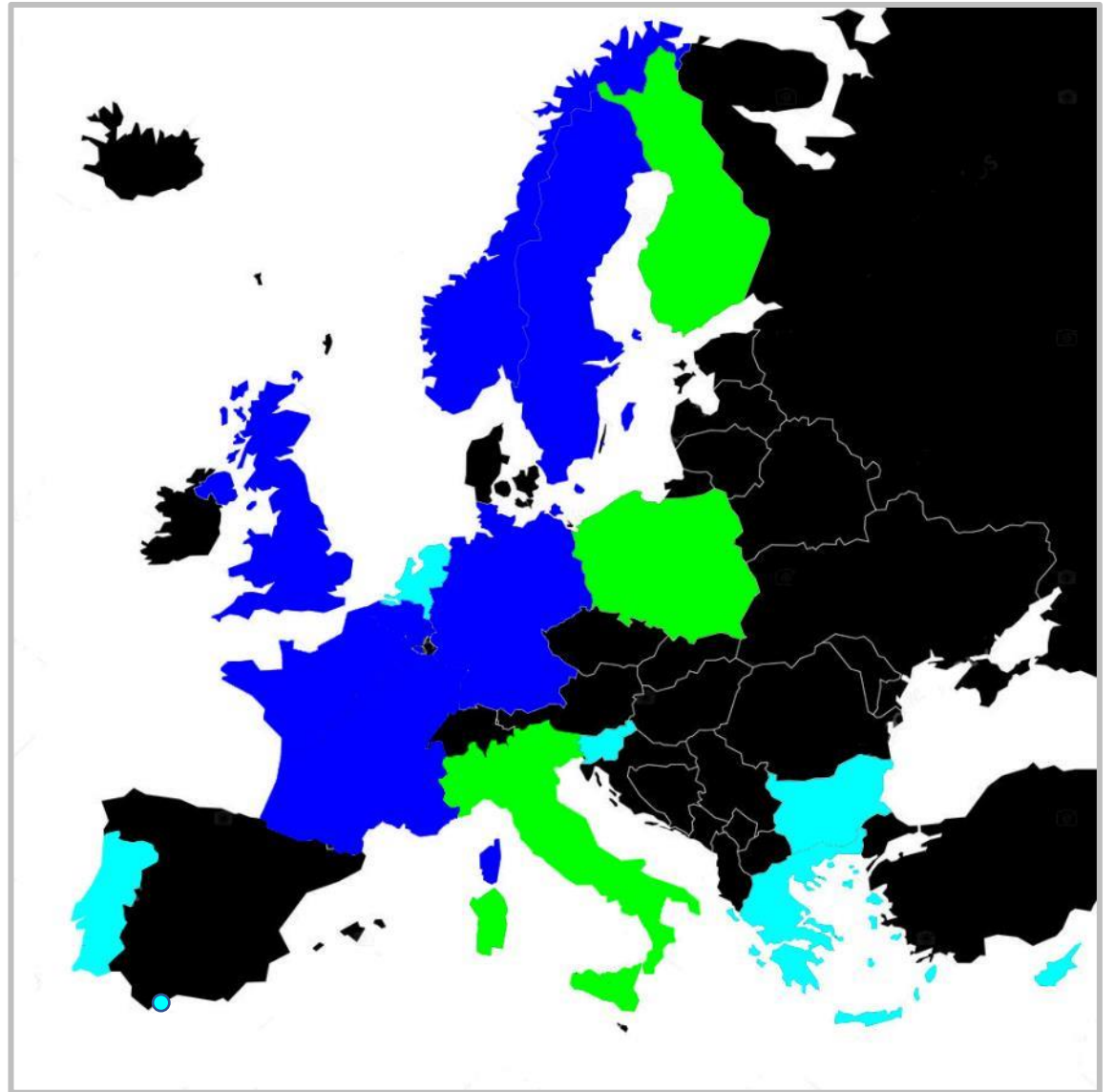


(A)ESD standards endorsement





2008
5 countries



2023
16 countries/territories

BE, DE, FR, NO, SE, UK, FI, IT, PL, BG, CY, GR, NL, PT, SL

Statutory, member, candidate

Optimal scientific output? Is it enough?

Yes:

- ♦ Minimum standards of competence are being incorporated into the laws of more and more countries in which
 - quality of training is monitored
 - issuance of certificates of competence is controlled
- ♦ Minimum standards are recognized and enforced despite the absence of legal requirements to do so in other countries
- ♦ Mobility of scientists is increasing

No:

- ♦ Some countries are abandoning their efforts because of the excessive administrative and legal complexity
- ♦ Because the need for manpower cannot be met by the occupational diving scientific sector alone.

What are the needs?

Focus on marine ecology and environment

More and more data sets are needed

If local-scale studies \Rightarrow particular abiotic and biotic factors \leftrightarrow species and community responses

it is shown more and more often, identified local factors may collapse when re-evaluated at a regional scale

Data at regional and global scales are now recognized as fundamental to progress in ecology.

\Rightarrow In the subtidal marine realm, difficult to penetrate, can get large dataset thanks to Citizen Science

What is Citizen Science (CS)

Citizen Science – CS (common aliases= *amateur science, community science, crowd science, crowd-sourced science, civic science, volunteer monitoring*), **is participation in scientific research conducted, in whole or in part, voluntarily by amateur and/or nonprofessional scientists.**

Outcomes are often advancements in scientific research by

- **improving the scientific communities' capacity,**
- increasing the public's awareness,
- understanding of science ⇒ respect of the environment.

BioDiversa definition of Citizen Science: *“the involvement of the non-academic public in the process of scientific research - whether community-driven research or global investigations”*.

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In this frame, the training of volunteer recreational divers to scientific specialties (e.g. marine biology or oceanology certifications) as organized by recreational diving agencies (CMAS, GUE, PADI, ...) is an added value (Citizen Science Diving – CSD).

⇒ Aiming at the conscientisation of a broad public, it is a clear advantage for further participation to citizen science projects.

It should be borne in mind that the legal framework [risk assessment, insurance, policy], the objectives, the actors, and audience are de facto different from OSD.

What do environmental managers need?

An ever-increasing need for underwater data, due to

- the ever-**larger spatial scale** of investigations and monitoring
- & data collection over a **longer time scale**

This need is particularly acute in the marine realm, where threats are

- *out of sight,*
- *under-mapped,*
- *cumulative, and*
- *often poorly understood ⇒ generating inefficiently managed impact*

⇒ A simple “scientific diving *label*” is not enough.

- To be effective, any action must be integrated into a **coordinated project**.
- Each actor, professional or amateur scientist, must **play a defined role in the right place**, according to their **real skills**.

Roles of the different types of divers

- development, testing & validation of (complex) protocols

The level of knowledge and the gradation and sequencing of skills should allow the assignment of the "right" type of task to each group

- explanation & implementation of protocols
- data validation & processing

- implementation of simplified protocols

**. Supervisors
. CS survey validation**

*Often time limited ⇒
relatively short prospects*

Longer spatio-temporal prospects

OSD

CSD

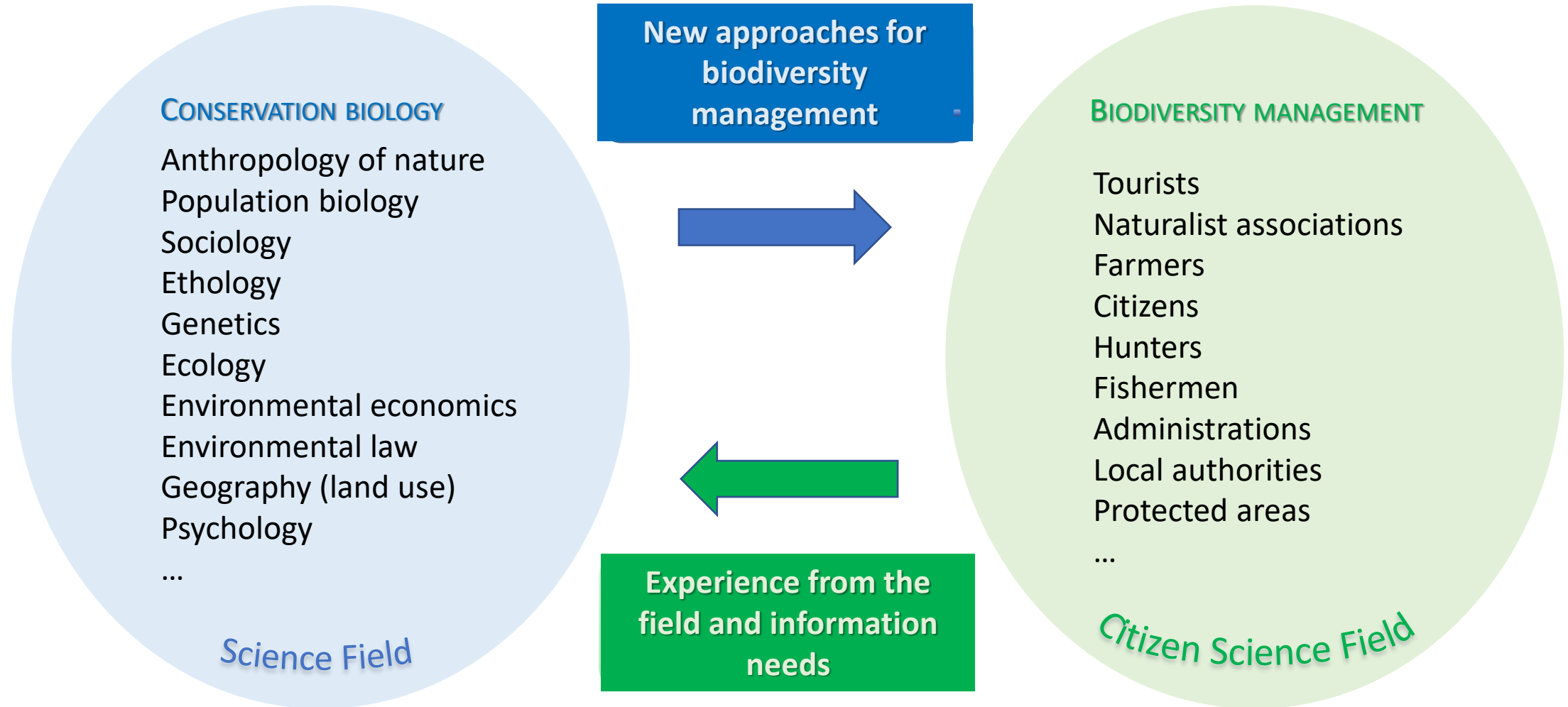
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*Occupational standards
(by law)*

No specific standards

*Recreational standards
(agencies)*

Example of feed back loop between researcher works and citizen science actions: Adaptive biodiversity management

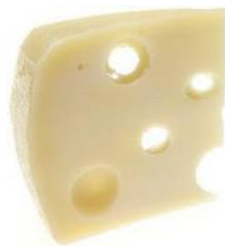




al pan pan y al vino vino

dire pane al pane e vino al vino

dar nome pão, pão, queijo, queijo



Calling a spade, a spade

å kalle en spade for en spade

Man ska nämna barnet vid dess rätta namn

Appeler un chat, un chat

Nazywać rzeczy po imieniu

das Kind beim rechten Namen nennen

τὰ σῦκα σῦκα, τὴν σκάφην δὲ σκάφην ὀνομάσων

Sanotaan asia niin kuin se on



de dingen bij hun naam noemen

Nowadays, another approach exists, ignoring all this, blurring the landscape

Recreational diving training sector

Cross-sectoral skills for the blue economy
market (Project id: 863674 – EMFF Blue
Economy 2018 – **Blue Careers**)



4 universities +
2 consultants
(+ PADI) from 4
countries

International Standards in
process

ISO/TC 228

Tourism and related services

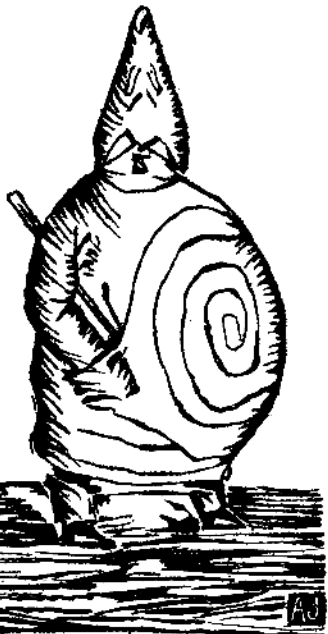
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**CD 8804-i_Requirements for the
training of Scientific Divers**



**Parallel standards system
for OSD**

**Which added
value?**





Thank you for your attention