

# How to curate and exhibit various types of physical samples using FAIR principles

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## INTRODUCTION

Physical samples, connected to their underlying metadata, are a valuable resource for future research. This however requires that their existence is findable, information and data accessible and re-usable.

## THE TASK

GEOMAR Helmholtz Centre for Ocean Research has accumulated thousands of biological and geological samples, collected mainly during marine expeditions.

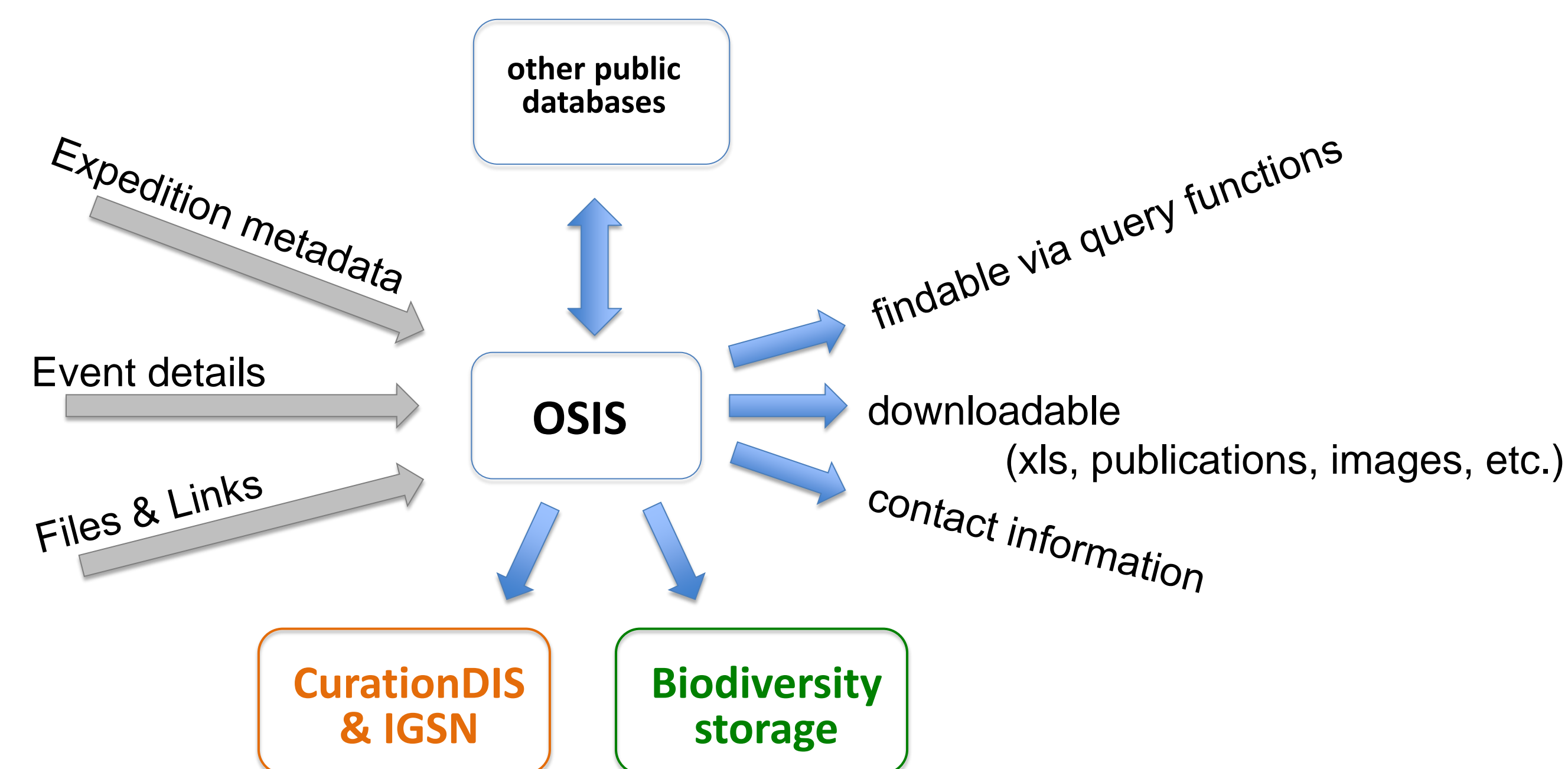


- **Biological** collection: over 200.000 samples (mainly fish and plankton) in formaldehyde and cryofrozen.
- **Geological** core and rock repository: 4000 sediment cores and 5000 boxes with hard rocks and refined sample specimens.

We have set ourselves the task to curate all these materials and connect them with sufficient metadata in order to make them searchable and, more importantly, findable.

## OUR APPROACH

The **Ocean Science Information System** at GEOMAR (**OSIS**) joins all kind of data resulting from the institute's sea-going expeditions and land-based projects. OSIS serves as a **hub** for detailed information, metadata and references to peer-review journal publications. The metadata in OSIS are publicly accessible and the system is interlinked to several other data archives and databases. It will act as a first entry point for scientists to identify samples by their metadata even before contacting the appropriate curator to inquire sample accessibility and conditions.



## EXAMPLES

Event/Locality	Description	Gear	Time [UTC]	Lat/Lon	Depth [m]	Resp. Person	Files	Links
96GC-23	GC-23	Gravity Corer   GC	2012/03/13 10:21	35.81098° / -11.34732°	4859	Petersen, Asmus	(3)	(0)
97GC-24	GC-24	Gravity Corer   GC	2012/03/13 15:35	35.79759° / -10.67537°	4814	Petersen, Asmus	(3)	(0)
100GC-25	GC-25	Gravity Corer   GC	2012/03/14 07:13	35.73900° / -10.20098°	4497	Petersen, Asmus	(3)	(0)

Options to **download** data in different formats and to visualise the cruise track in Google Earth (kml file)

**Additional information** about an expedition, i.e. all sampling events, datafiles, images and publications

### OSIS provides linkage to more specific sample databases:

**Biological samples** collected on a research vessel are connected via the expedition metadata to their current storage locations on land, which will be further refined to connecting single ship-based sampling stations with the storage position of individual samples.

**Geological samples** metadata from OSIS are made available for further in-house use by the software CurationDIS from smartcube GmbH. The sediment core specific details are managed by the curation software which is also used to provide a persistent identifier (IGSN).

Type of Link	Link Address (Path) / Description	Date created
Location	Biodiversity collection BARCODE :: Bongo :: 150µm :: Plankton :: GEOMAR-BDC-BOX0002	2019-01-17 16:42
Location	Biodiversity collection BARCODE :: Multinet-Maxi :: 300µm :: 24h_station :: GEOMAR-BDC-BOX0003	2019-01-17 16:42
Location	Biodiversity collection BARCODE :: Multinet-Maxi :: 300µm :: 24h_station :: GEOMAR-BDC-BOX0004	2019-01-17 16:42
Location	Biodiversity collection BARCODE :: JFT :: 50mm :: Herring_stomachs :: GEOMAR-BDC-BOX0006	2019-01-17 16:42
Location	Biodiversity collection BARCODE :: JFT :: 50mm :: Spratt_stomachs :: GEOMAR-BDC-BOX0006	2019-01-17 16:42

**Storage information**

Identifier	Project(s)	Chief Scientist	Departure/Return	Events/Localities	Files	Links	WWW
M78/1	COMET	Schönfeld, Joachim	2009/02/21 - Cristobal (Panama), 2009/03/28 - Port of Spain (Trinidad and Tobago)	222	4	296	✓
M77/2	SFB754	Schneider, Ralph	2008/11/24 - Callao (Peru), 2008/12/22 - Guayaquil (Ecuador)	164	108	583	✓
M77/1	SFB754	Pfannkuche, Olaf	2008/10/22 - Talcahuano (Chile), 2008/11/21 - Callao (Peru)	247	118	195	✓
ARK-XXIII/3		Jokat, Wilfried	2008/08/12 - Reykjavik (Iceland), 2008/10/17 - Bremerhaven (Germany)	1	2	9	✓

**Context: overview of all expeditions recovering sediment core held in the repository**

## OUTLOOK

Future plans include

- connecting rock samples and biological samples from experiments similarly to the sediment cores, plankton and fish samples
- implementing more intelligent query functions

Feedback by users is very welcome!

