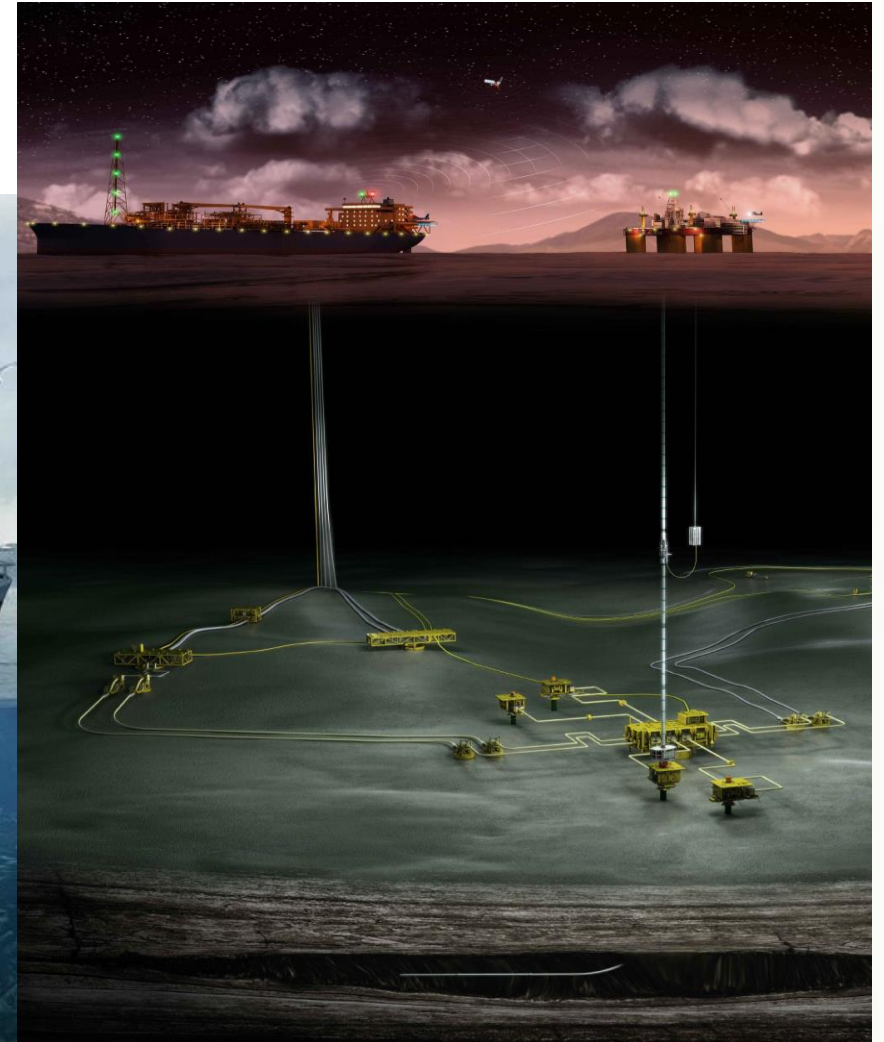# FAIR implementation for Norwegian Marine Data Sets
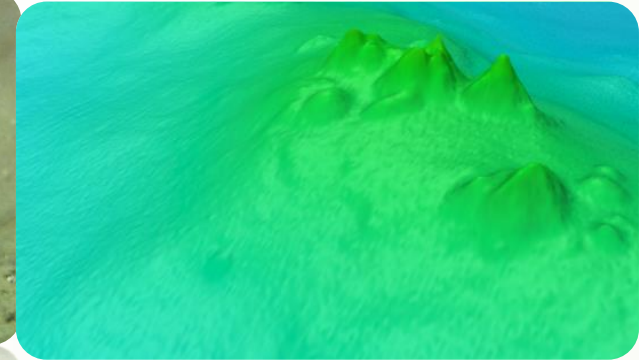
Kartverket

Evert Flier, Norwegian Mapping Authority
IODC-II, 20 March 2023, Paris

Rich on natural resources

The MAREANO Program –
## Mapping the seabed in the Norwegian Waters for management of sea areas

MAREANO
Marine AREA database for NOrwegian waters

Ecosystem-based marine management in Norway

- The Norwegian Government has developed integrated marine management plans for all Norwegian sea areas.

- The management plans are large-scale spatial management tools and cover the areas in Norway's Exclusive Economic Zone, outside the coastal baseline.
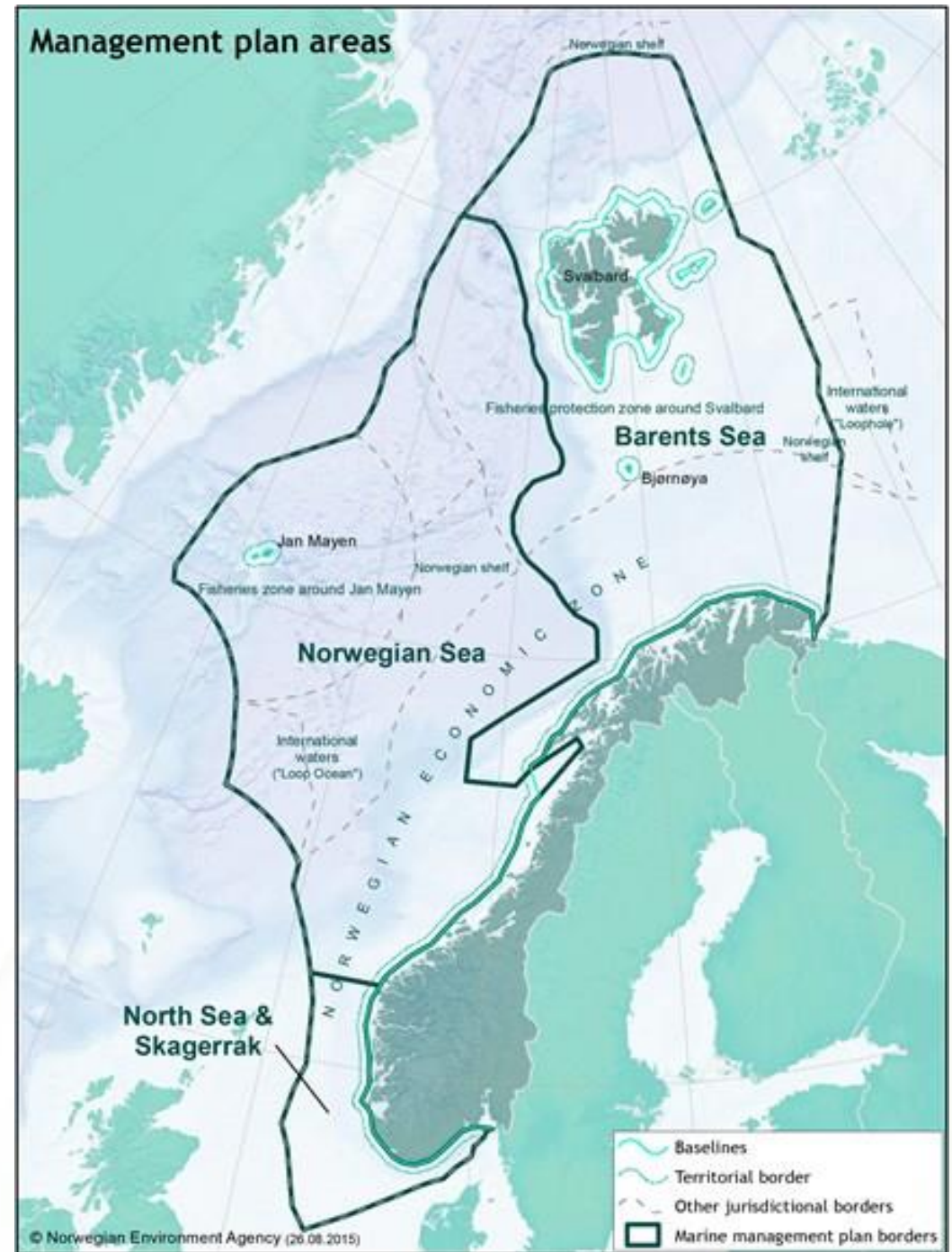
Improve the user orientation

The user needs are the foundation of how we approach this project

Development of geospatial content and geospatial services based upon user dialogues, e.g. through user surveys, user stories, and/or product specifications, enhances the possibilities of meeting the user needs

The user communities within the Arctic Council play a vital role this development. *The project will seek participation on these arenas to ensure common matureness and understanding of the user needs*
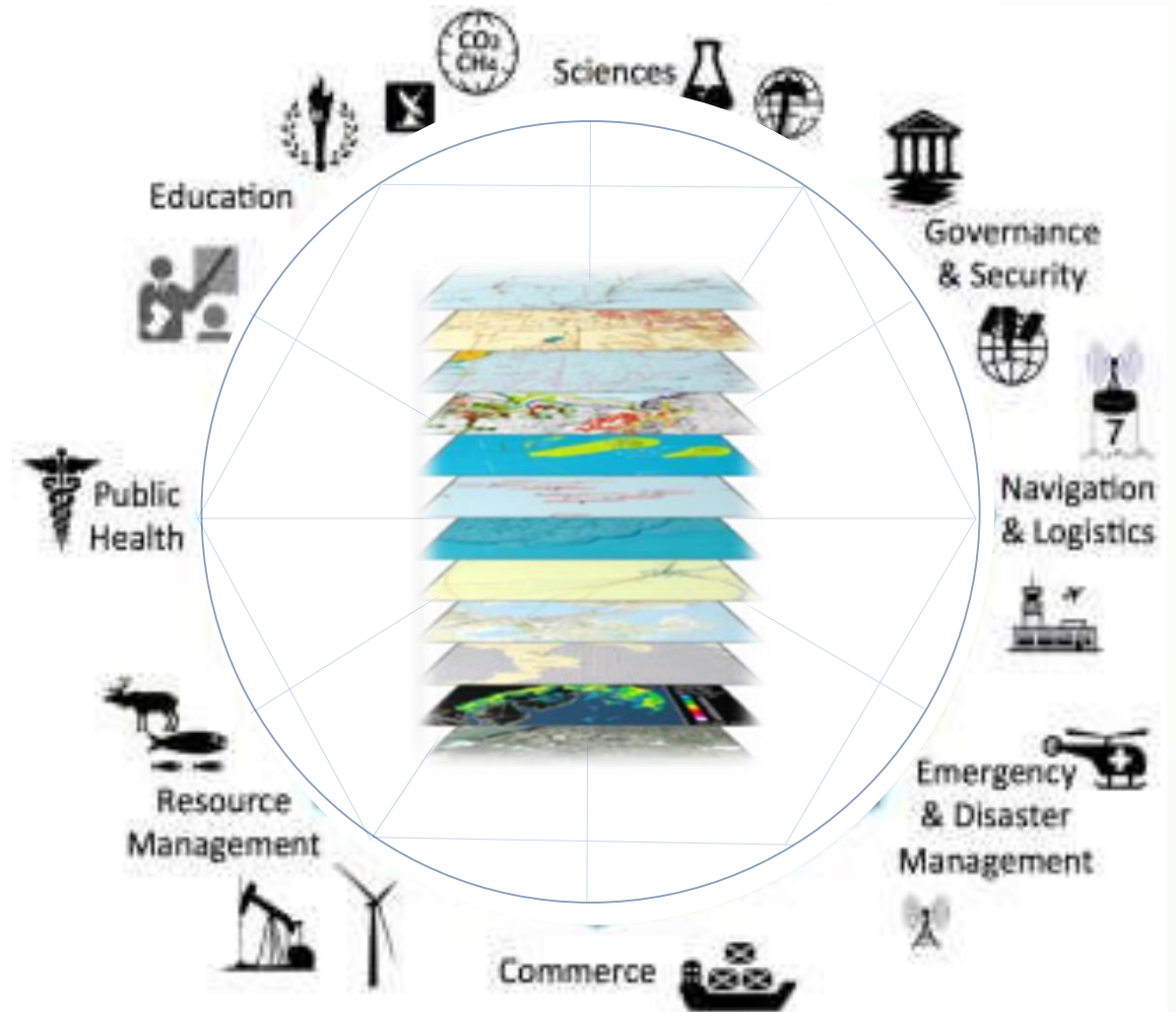
Marine Spatial Management Tool

A cross-sectoral development project through an intergovernmental cooperation

A governmental initiative based on the need for a more coherent and uniform geospatial information content, suitable for underpinning tasks attached to marine spatial planning and marine management

- More effective updates of the management plans

- Better overview over political decisions and actions related to marine management

- Contribute to more transparancy, openness and increased involvment from the stakeholders

Findable Accessible Interoperable Reusable
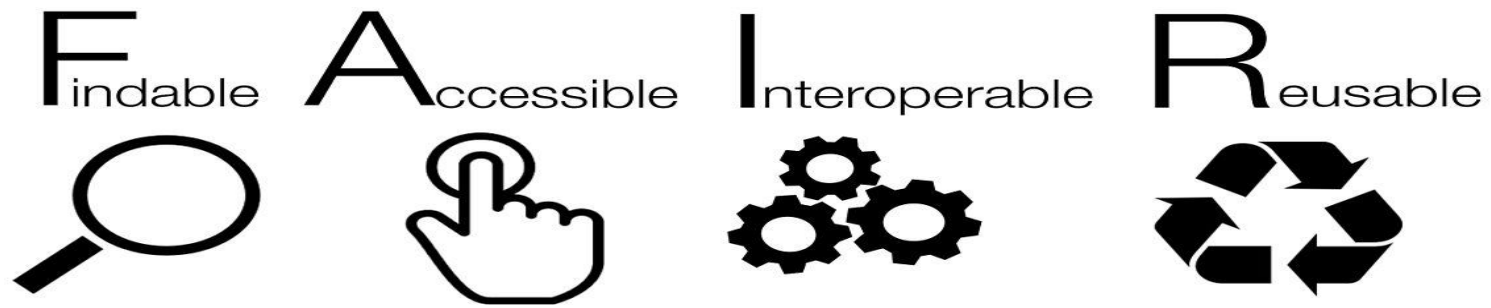
- Enormous amounts of data in all shapes and formes
  - «Spatial is not special» → «Spatial is normal»
  - Distributed datacollection and data management responsibilities
- Abundance of users and areas of use
  - Need for common and updated knowledge database
  - Need for joint situational picture across sectors and areas of use
  - Need to be able to combine data
  - Need for data that is ready to be analysed

- Challenge:
  - Use too much time to find data
  - Use too much time to structure data

FAIR-principals

To be Findable:
F1. (meta)data are assigned a globally unique and persistent identifier
F2. data are described with rich metadata (defined by R1 below)
F3. metadata clearly and explicitly include the identifier of the data it describes
F4. (meta)data are registered or indexed in a searchable resource

To be Accessible:
A1. (meta)data are retrievable by their identifier using a standardized communications protocol
A1.1 the protocol is open, free, and universally implementable
A1.2 the protocol allows for an authentication and authorization procedure, where necessary
A2. metadata are accessible, even when the data are no longer available

To be Interoperable:
I1. (meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
I2. (meta)data use vocabularies that follow FAIR principles
I3. (meta)data include qualified references to other (meta)data

To be Reusable:
R1. meta(data) are richly described with a plurality of accurate and relevant attributes
R1.1. (meta)data are released with a clear and accessible data usage license
R1.2. (meta)data are associated with detailed provenance
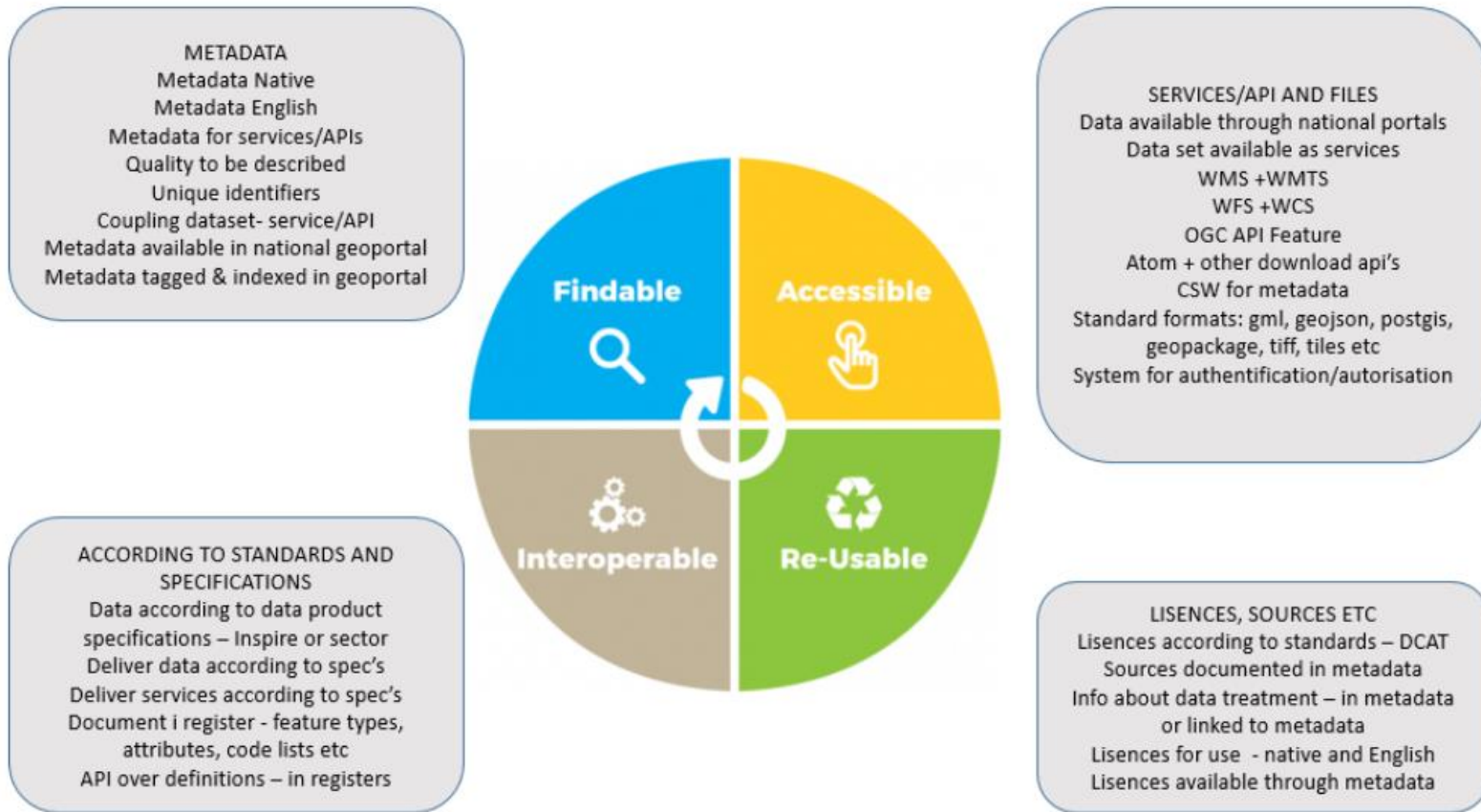R1.3. (meta)data meet domain-relevant community standards

Both metadata and data content
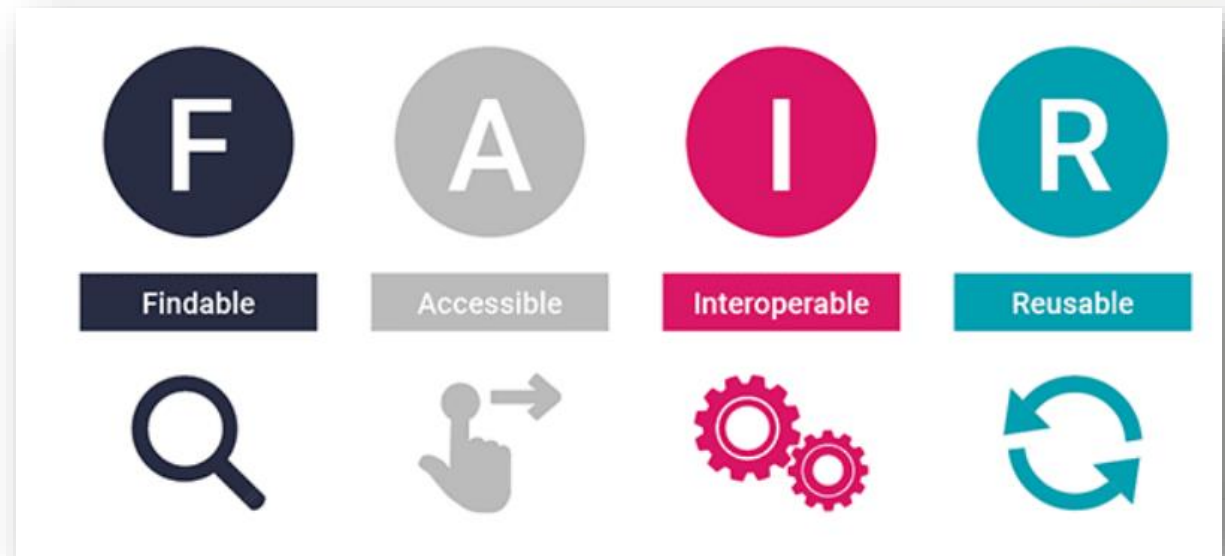
Both machine readable and understandable for humans

FAIR in a Geo Spatial Infrastructure

FAIR implementation by using geospatial infrastructure standards, technologies and routines

METADATA
Metadata Native
Metadata English
Metadata for services/APIs
Quality to be described
Unique identifiers
Coupling dataset- service/API
Metadata available in national geoportal
Metadata tagged & indexed in geoportal

SERVICES/API AND FILES
Data available through national portals
Data set available as services
WMS +WMTS
WFS +WCS
OGC API Feature
Atom + other download api's
CSW for metadata
Standard formats: gml, geojson, postgis, geopackage, tiff, tiles etc
System for authentification/autorisation

Findable

Accessible

Interoperable

Re-Usable

ACCORDING TO STANDARDS AND SPECIFICATIONS
Data according to data product specifications – Inspire or sector
Deliver data according to spec's
Deliver services according to spec's
Document i register - feature types, attributes, code lists etc
API over definitions – in registers

LISENCES, SOURCES ETC
Lisences according to standards – DCAT
Sources documented in metadata
Info about data treatment – in metadata or linked to metadata
Lisences for use - native and English
Lisences available through metadata

Measure 1: FAIR-calculator

- An automated engine/module in GeoNorge
- Simple and effective communication
- Relevant way beyond the research community
- Reuse of standards and guidelines where possible
- (Norwegian) Guidance document: FAIR implementation for enhanced use of geo information

FAIR implementation by using geospatial infrastructure standards, technologies and routines
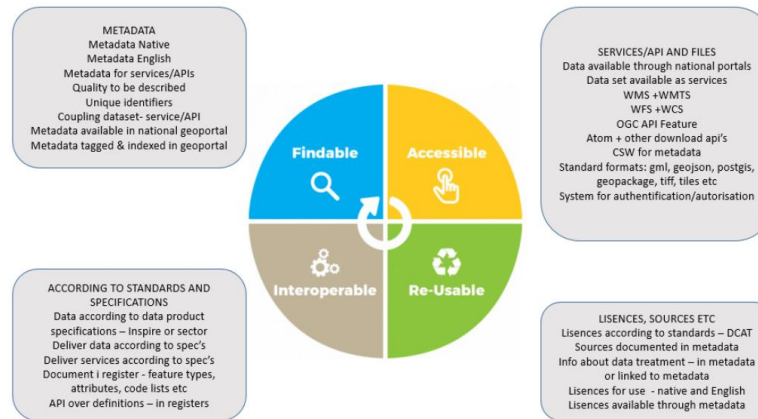
Veileder

FAIR for utvidet bruk av geografisk informasjon
- Veileder for implementasjon gjennom aktiv bruk av eksisterende standarder

Kartverket, Havforskningsinstituttet og Norges geologisk undersøkelse
Versjon 2.0, Februar 2022

GEONORGE 🔍 📍 ☁️ Menu ☰

Mareano Status Register

The register provides an overview of data collected through the projects; Mareano and "Marine base map". The overview shows the status of various datasets' fulfillment of the FAIR principles as well as other requirements from the national geographical infrastructure

Filter organization: Updated: 23/06/2021

Alle ▼

| Dataset | Reports |

Showing 1 - 50 of 66 hits   Save As:

| 1 | » | »» |

CSV ▼ Save

Title	Owner	F	A	I	R	ℹ	📋	🛈	🖼	SOSI	GML	🌐	🌍	📶	⬇	🎯
Accumulation basins	Geological Survey of Norway	🙂	🙁	😐	🙂	🙂	🙂	🙂	🙂	😐	😐	😐	🙁	🙁	🙁	5.5
Acoustic backscatter, confidential data	Geological Survey of Norway	🙂	🙁	🙂	🙂	🙂	🙁	🙂	🙁	⚪	⚪	🙁	🙁	🙁	🙁	2
Artsmangfold – Svampobservasjoner per	Institute of Marine Research	🙂	🙂	🙂	🙂	🙂	🙂	🙂	🙂	🙂	🙂	😐	🙂	🙂	🙂	9.5

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FAIR status: 🙂 77%

🟢 **Findable:** Metadata and data should be easy to find for both humans and computers. Machine-readable metadata are essential for automatic discovery of datasets and services

100%

Details

🔴 **Accessible:** Datasets must be accessible through standardized and open interfaces.

25%

Details

🟢 **Interoperabel:** The data usually need to be integrated with other data. In addition, the data need to interoperate with applications or workflows for analysis, storage, and processing.

100%

Details

🙂 **Reusable:** The ultimate goal of FAIR is to optimise the reuse of data. To achieve this, metadata and data should be well-described so that they can be replicated and/or combined in different settings.

85%

Details

Kartverket

☹ **Accessible:** Datasets must be accessible through standardized and open interfaces.

25% Read less

A1: Datasets are available through standard web protocols and open standardised services

✘ It is checked whether the dataset has a "direct" download service (WFS or WCS) (weight 15)

✔ It is checked whether the dataset has a view service (WMS or WMTS) (weight 15)

✘ It is checked whether the dataset is available through the "Geonorge download api" (weight 15)

✘ Checking if dataset is available as a download service for predefined datasets (Atom Feed) (weight 5)

✘ It is checked whether the protocols that provide access to the datasets are openly accessible and readable with standard IT tools. Which we consider to be sufficient if one has provided a download URL with Https response (weight 40)

✔ The protocol allows for an authentication and authorisation procedure, where necessary

A2: Metadata are accessible, even when the data are no longer available

☺ **Interoperabel:** The data usually need to be integrated with other data. In addition, the data need to interoperate with

100% applications or workflows for analysis, storage, and processing.

Details

Thank you

Kartverket

Evert.flier@kartverket.no

- One of the roles and tasks of the Norwegian Mapping Authority is that of the national geodata coordinator of Norway. In that role we work on continuously improving our national geospatial infrastructure, ensuring secure data sharing of data from government and research agencies.
- The Norwegian Mapping Authority, The Norwegian Geological Survey and the Institute for Marine Research have jointly established a FAIR Guidnace document and a FAIR calculator / validator for data and api
- Eventually we aim to have all datasets available through our national infrastructure FAIR validated through our FAIR calculator
- **FAIRNESS –calculator/validator:** An automated engine / module in GeoNorge. Results can be shown in both Norwegian and English
  - Overview FAIR : https://register.geonorge.no/mareano-statusregister
  - Details: https://register.geonorge.no/mareano-statusregister/bunnsedimenter-kornst%C3%B8rrelse-regionalt/a6f6ca19-6fd6-41e8-b78e-c5e38376ac78
  - English: https://register.geonorge.no/mareano-statusregister/artsmangfold-videoobserverte-korallbunntyper/4bda4343-a927-404f-9121-6b7c6eae03e1?lang=en

Kartverket