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Enriching Science Search
with the Open Search
Framework MOSAIC
Alexander Nussbaumer, Sebaistian Gürtel,
Johannes Honeder, Tobias Hecking, Christian Gütl
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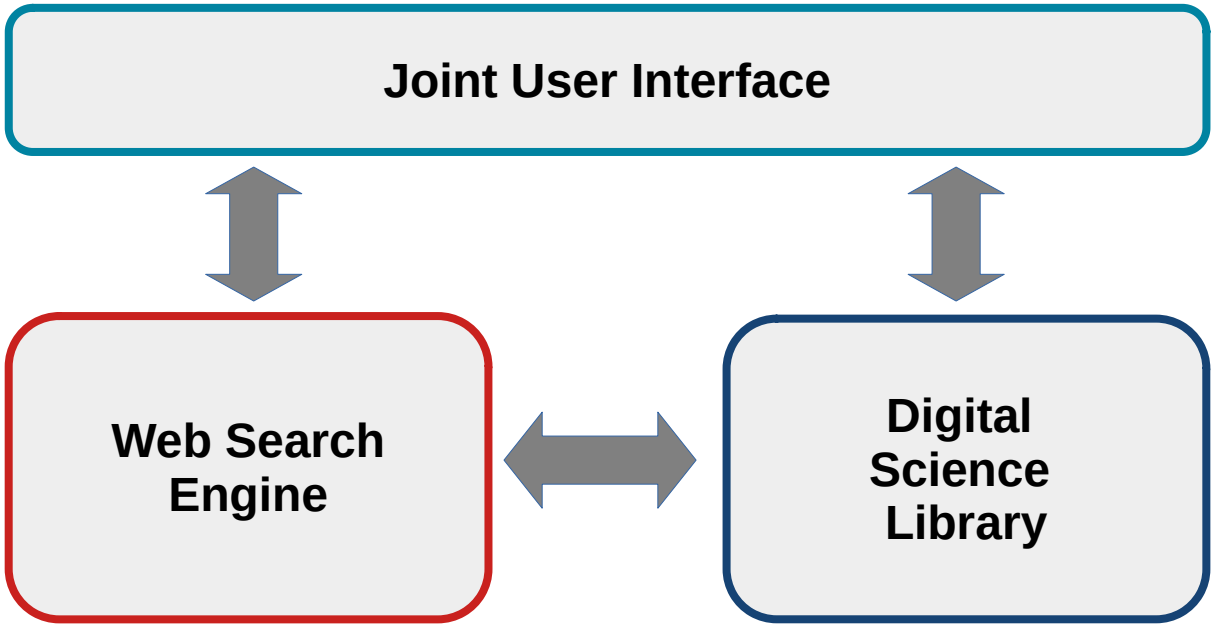
Science Search and Digital Libraries

- Science search is mostly done in digital libraries
- Many digital science libraries available
  - Universities, journals, publishers, referencing systems
- Current solutions focus on formally published material
  - Search and filter for bibliographic metadata
- Requirements
  - Effectiveness, efficiency, usability satisfactory
  - Meeting information needs

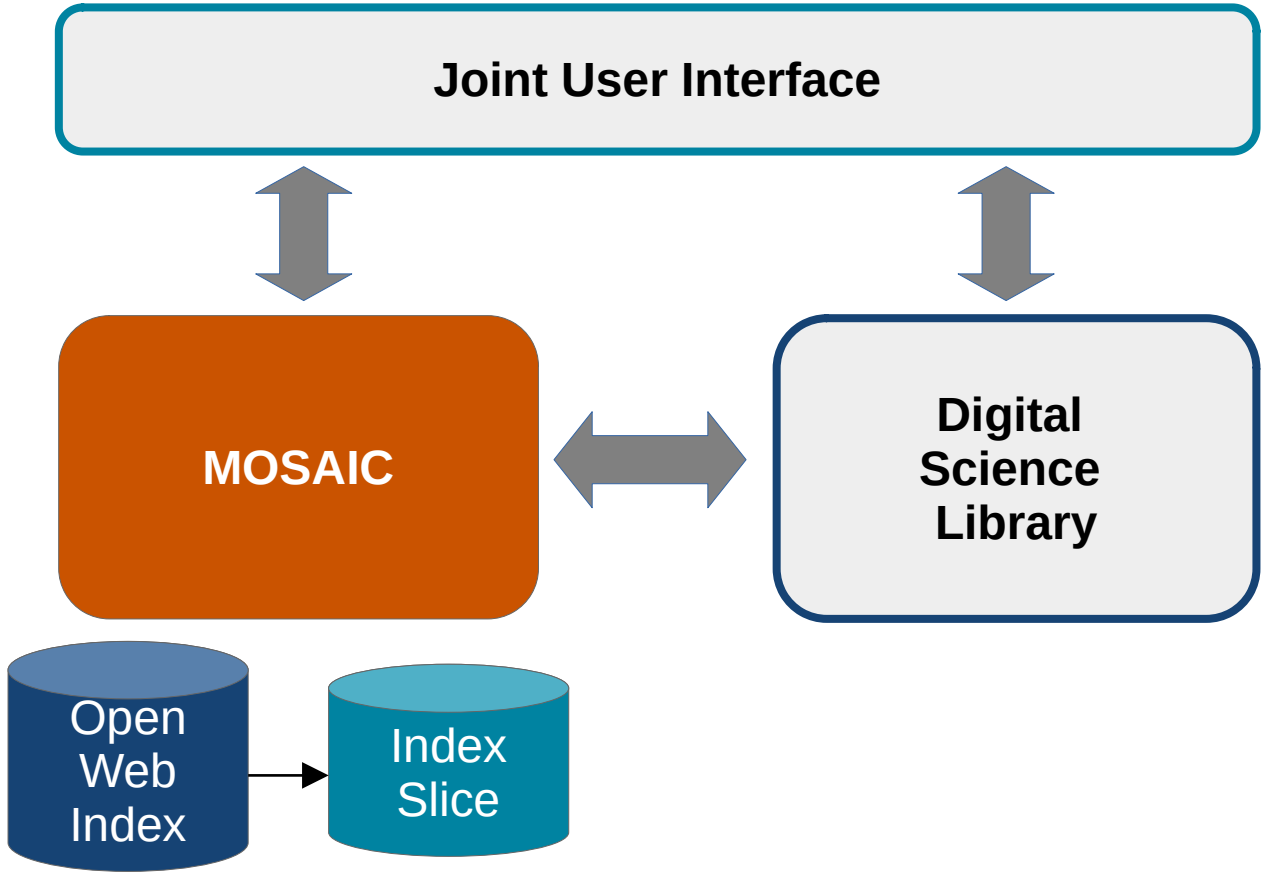
Science-Related Web Data

- More information on research available on the web
  - Conference information, research institution, research data, events, news, blogs, etc.
- In fact, scientific search includes web search
  - In addition to search in digital libraries
- Need for a technical integration of search in different sources

Integrating Web Data with Science Search

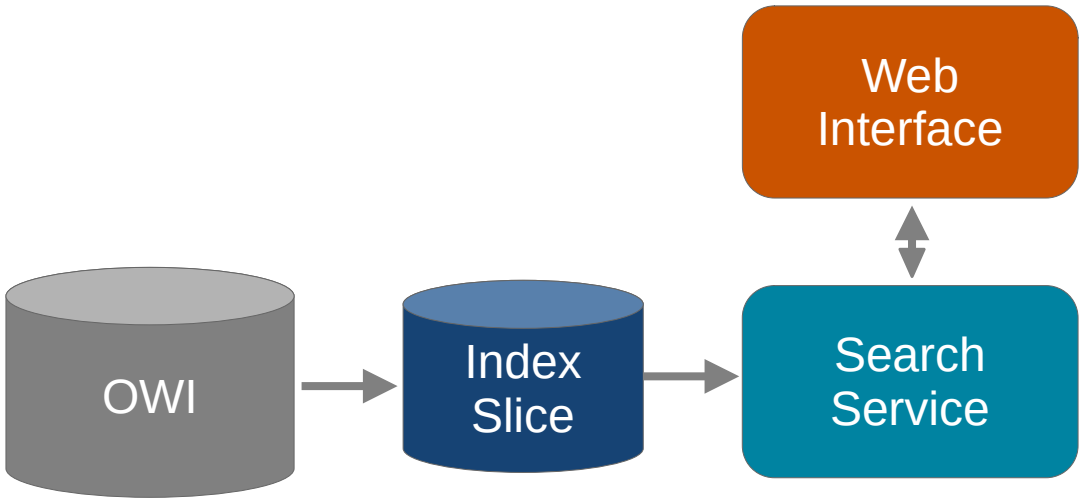


Integrating Web Data with Science Search



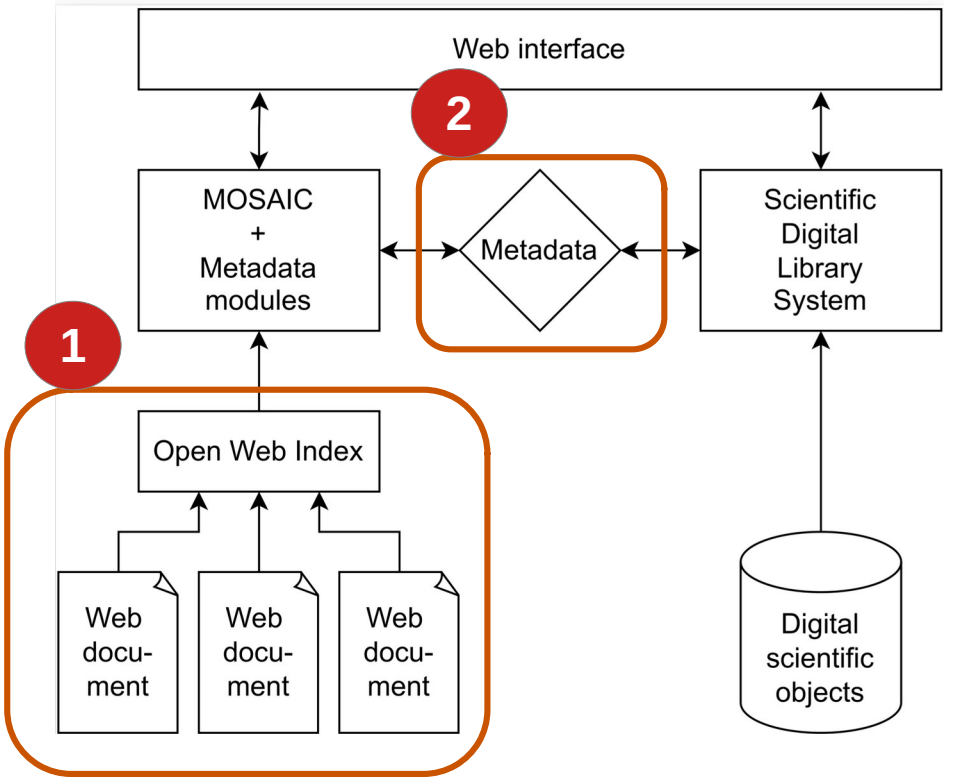
MOSAIC

- **Mo**dular **S**earch **A**pplication based on **I**ndex Fra**c**tions
- Generic implementation of an OWS.eu vertical search engine
  - Demonstration of the concept of an OWS.eu vertical engine
  - Out-of-the-box search engine
  - Framework for building an own search application



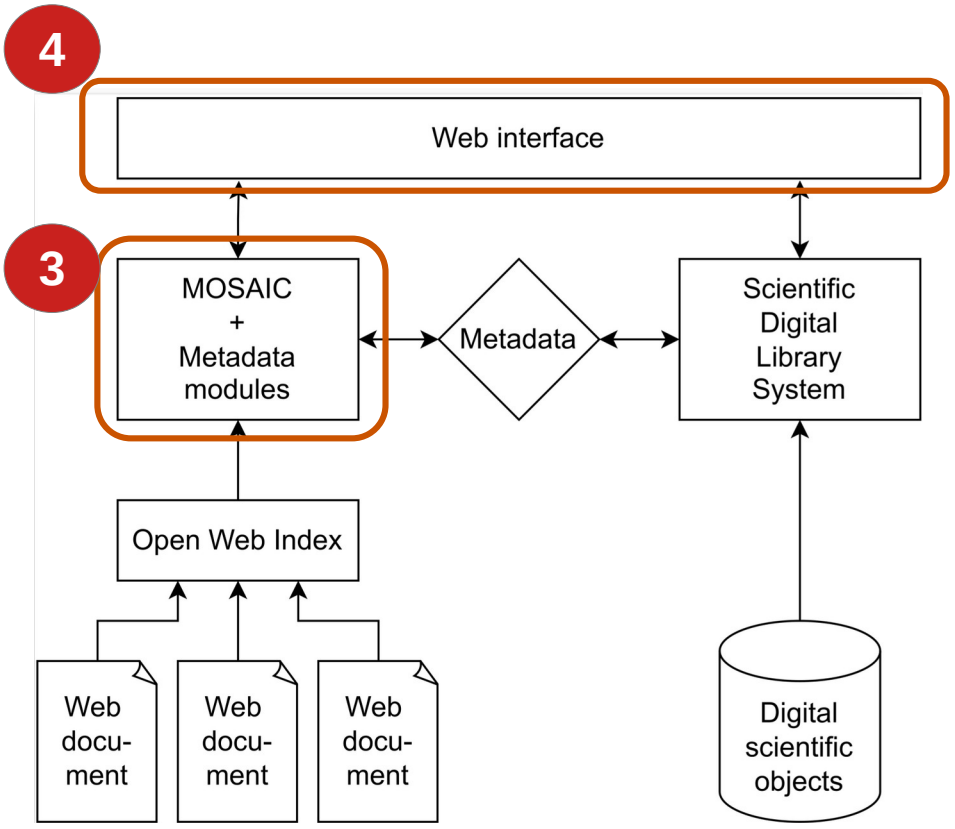
Integrating MOSAIC with Science Search

- Specifying the search domain (1)
  - Related to digital library
  - Creation of an index slice
- Specifying the metadata (2)
  - Depends on digital library
  - keywords, geo-location, topic, bibliographic information, etc.



Integrating MOSAIC with Science Search

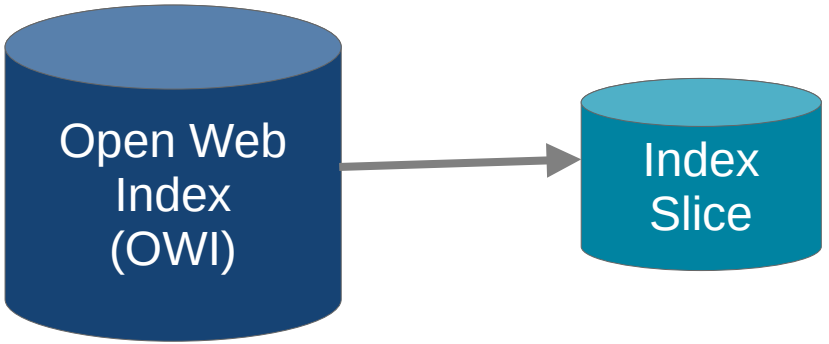
- Create a module in MOSAIC (3)
  - Processes metadata in index
- Create a User Interface (4)
  - Federated search: integration of search queries and results over services



Specifying the Search Domain

Creation of an index slice

- List of URLs
- Filtering according to metadata
- Focused crawling (classifier to discover relevant content)



Specifying the Metadata

- Metadata are calculated in pre-processing phase
- Metadata can be extended (e.g. keywords)

CIFF

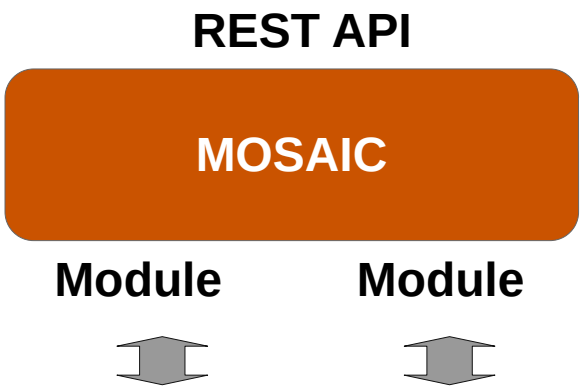
Term	List of (Document, Frequency)
Term 1	(docID A, 1) (docID B, 3) (docID C, 1)
Term 2	(
Term 3	(
rm 4	(

Parquet

Document	Lang	Full text	Topic (Curlie)	Geo-location	Keywords
docID A	en	... text ...	Topic 1	23.234, 23.453	
docID B	de	... text ...	Topic 2	2.323, 42.2433	
docID C	de	... text ...	Topic 3	12.245, 22. 424	
docID D	en	... text ...	Topic 4	8.754, 66.456	

Metadata Module in MOSAIC

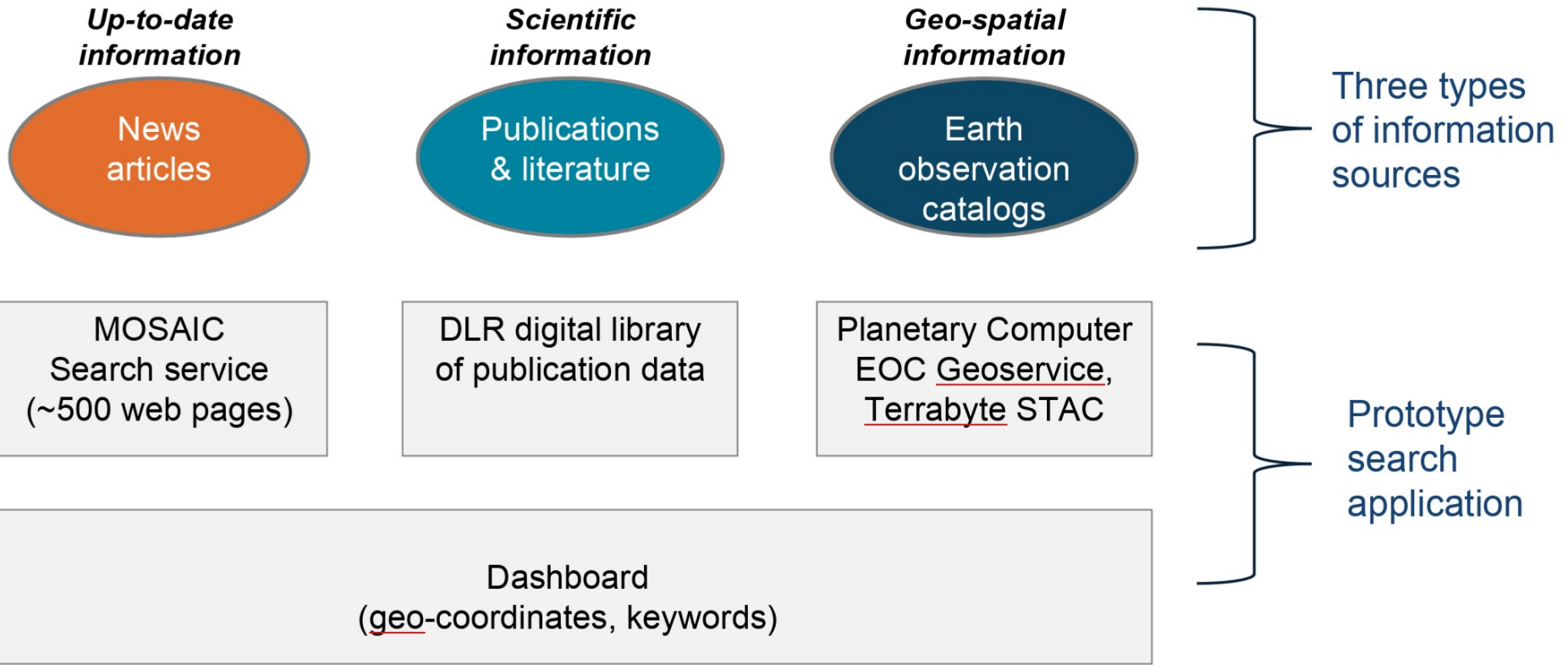
- Metadata processed by MOSAIC:
  - Filtering and search result
- Flexible approach to add modules



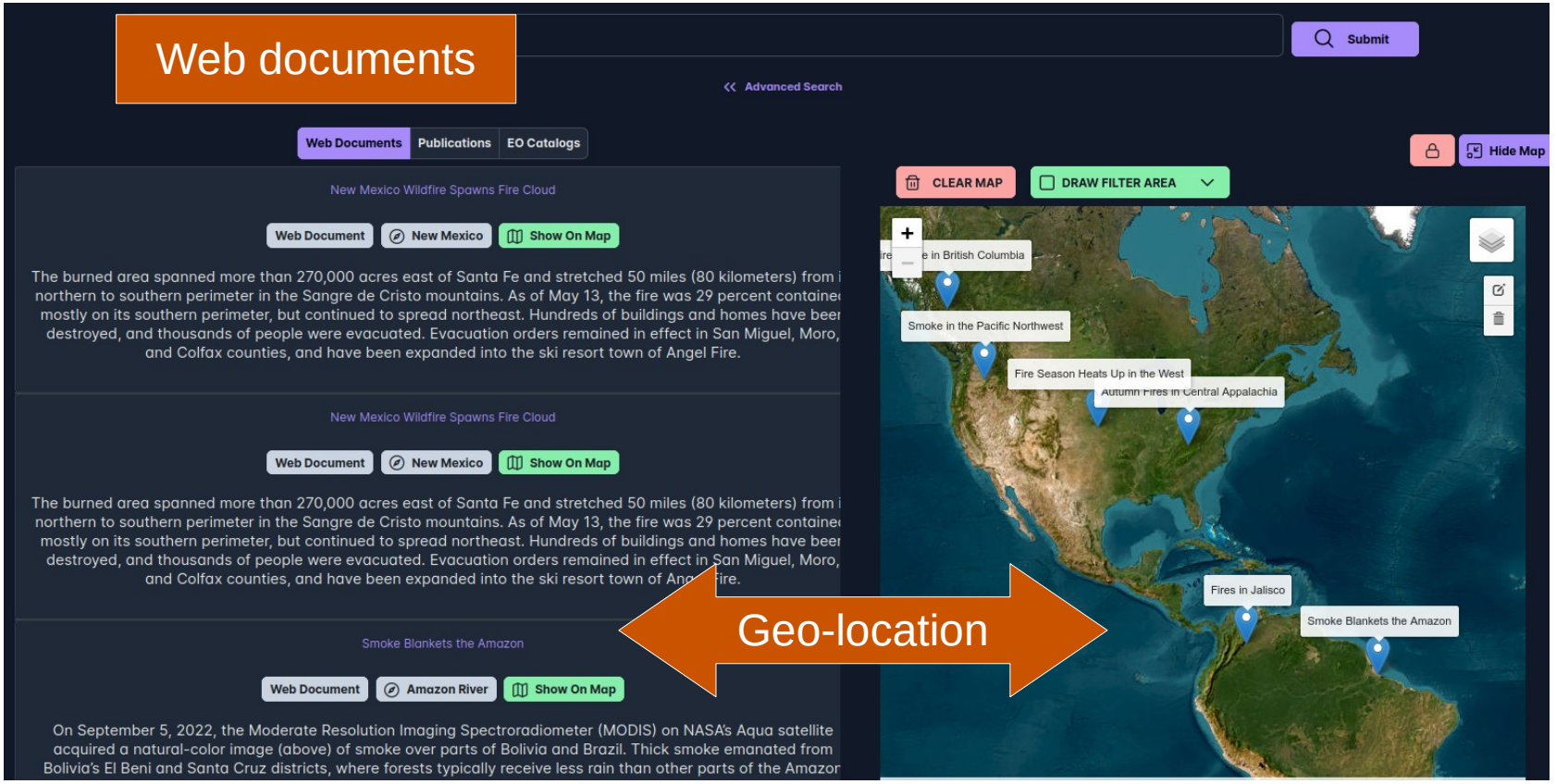
Index Slice

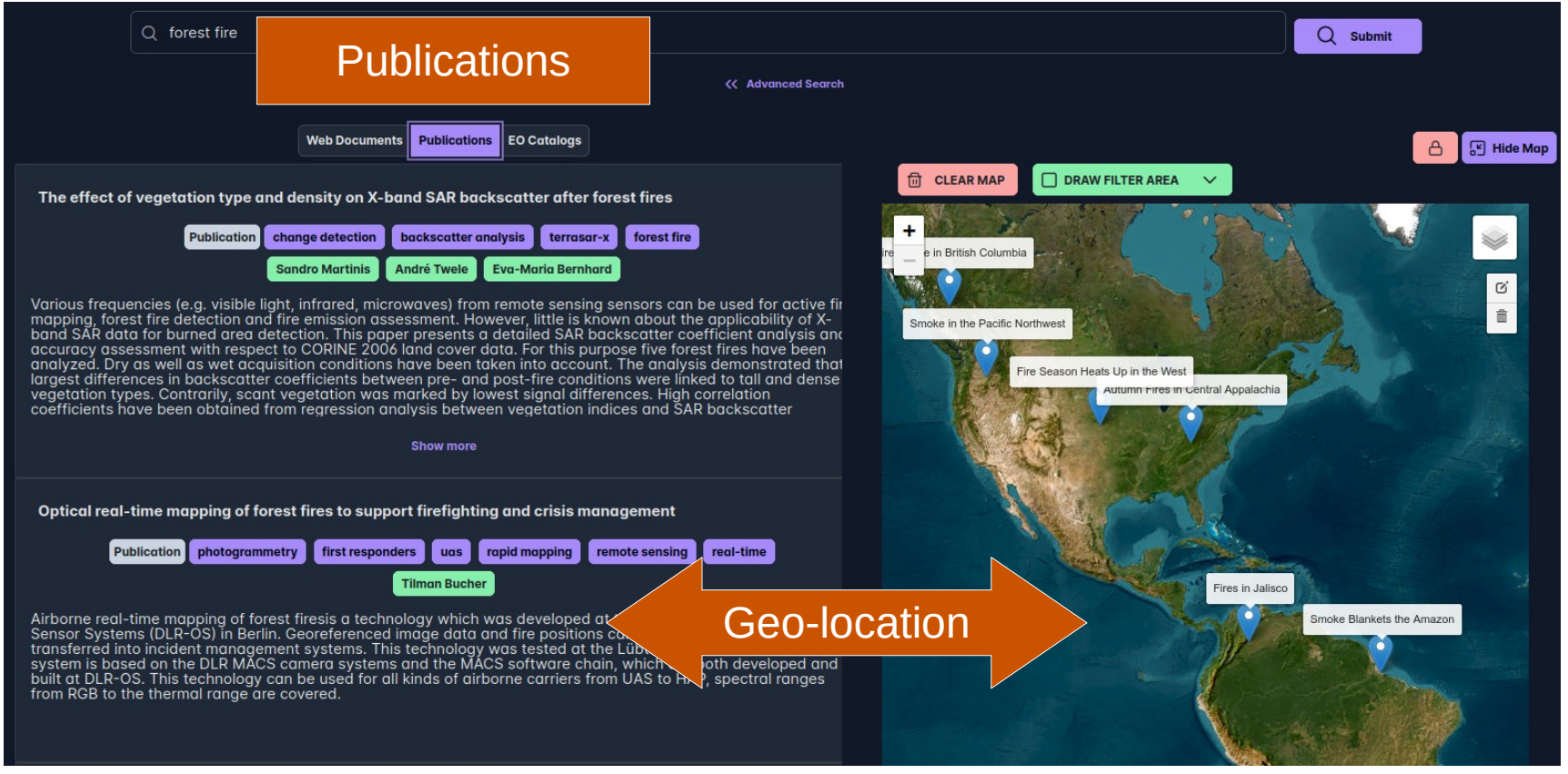
Document	Lang	Full text	Topic (Curlie)	Geo-location	Keywords	
docID A	en	... text ...	Topic 1	23.234, 23.453		
ocID B	de	... text ...	Topic 2	2.323, 42.2433		
ocID C	de	... text ...	Topic 3	12.245, 22. 424		

Use Case: Environmental Search



Use Case: Environmental Search




forest fire
Publications
Submit
Advanced Search
Web Documents
Publications
EO Catalogs
Hide Map
CLEAR MAP
DRAW FILTER AREA
The effect of vegetation type and density on X-band SAR backscatter after forest fires
Publication
change detection
backscatter analysis
terrasar-x
forest fire
Sandro Martinis
André Twele
Eva-Maria Bernhard
Various frequencies (e.g. visible light, infrared, microwaves) from remote sensing sensors can be used for active fi
mapping, forest fire detection and fire emission assessment. However, little is known about the applicability of X-
band SAR data for burned area detection. This paper presents a detailed SAR backscatter coefficient analysis an
accuracy assessment with respect to CORINE 2006 land cover data. For this purpose five forest fires have been
analyzed. Dry as well as wet acquisition conditions have been taken into account. The analysis demonstrated that
largest differences in backscatter coefficients between pre- and post-fire conditions were linked to tall and dense
vegetation types. Contrarily, scant vegetation was marked by lowest signal differences. High correlation
coefficients have been obtained from regression analysis between vegetation indices and SAR backscatter
Show more
Optical real-time mapping of forest fires to support firefighting and crisis management
Publication
photogrammetry
first responders
uas
rapid mapping
remote sensing
real-time
Tilman Bucher
Airborne real-time mapping of forest firesis a technology which was developed at
Sensor Systems (DLR-OS) in Berlin. Georeferenced image data and fire positions co
transferred into incident management systems. This technology was tested at the Lüb
system is based on the DLR MACS camera systems and the MACS software chain, which
built at DLR-OS. This technology can be used for all kinds of airborne carriers from UAS to H
from RGB to the thermal range are covered.
oth developed and
, spectral ranges
Geo-location
Smoke in the Pacific Northwest
Fire Season Heats Up in the West
Fires in Jalisco
Smoke Blankets the Amazon

Conclusions

- Enriching science search by integrating web resources
  - Using the infrastructure of OpenWebSearch.eu

- General model can be used in many domains
  - Various science topics, education, etc.

- Integrating Gen AI features
  - Query and ranking improvement, conversational search

Any Questions?

- Contact:
  - Alexander Nussbaumer
    alexander.nussbaumer@tugraz.at