

# EPOS Thematic Core Service Anthropogenic Hazards for SHEER project: maintain, process and manage your project research data

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## Introduction

Thematic Core Service Anthropogenic Hazards (TCS AH) is being developed in the framework of European Plate Observing System Program (<https://tcs.ah-epos.eu/>). TCS AH provides virtual access to a comprehensive, wide-scale and high quality research infrastructure in the field of induced seismicity and other anthropogenic hazards evoked by exploration and exploitation of geo-resources. TCS AH is designed as a functional e-research environment to ensure a researcher the maximum possible freedom for experimentation by providing a virtual laboratory flexible to create own workspace for processing streams. A data-management process promotes the use of research infrastructure in novel ways providing an access to: (i) data gathered in the so-called "episodes", comprehensively describing a geophysical process, induced or triggered by human technological activity, which under certain circumstances can become hazardous for people, infrastructure and the environment, (ii) problem-oriented, specific services, with the particular attention devoted to methods analyzing correlations between technology, geophysical response and resulting hazards, (iii) the intercommunity social functions, e.g. brokering of projects, common workspace for the project shared by the project members, upload/download data and codes to the common workspace, tools for communication of project members. The SHEER project uses TCS AH e-infrastructure to manage interdisciplinary data from seven independent episodes and data products from own research.

## Why join TCS AH?

- online data access with data download and upload tools
- advanced data visualization tools
- free workspace, processing memory and build-in tools for data analysis (software applications)
- intercommunity social functions: common workspace for shared projects, user's forum
- compatibility with SeisComp structure
- projects which already joined: IS-EPOS (POIG.02.03.00-14-090/13-00), EPOS IP (H2020-INFRADEV-1-2015-1), EPOS-PL (POIR.04.02.00-14-A003/16-00)

### SHEER Database (SHEERWER)

Raw data and documents

Access via browser from the website of SHEER project: <http://www.sheerproject.eu/> through institutional accounts.

#### STRUCTURE

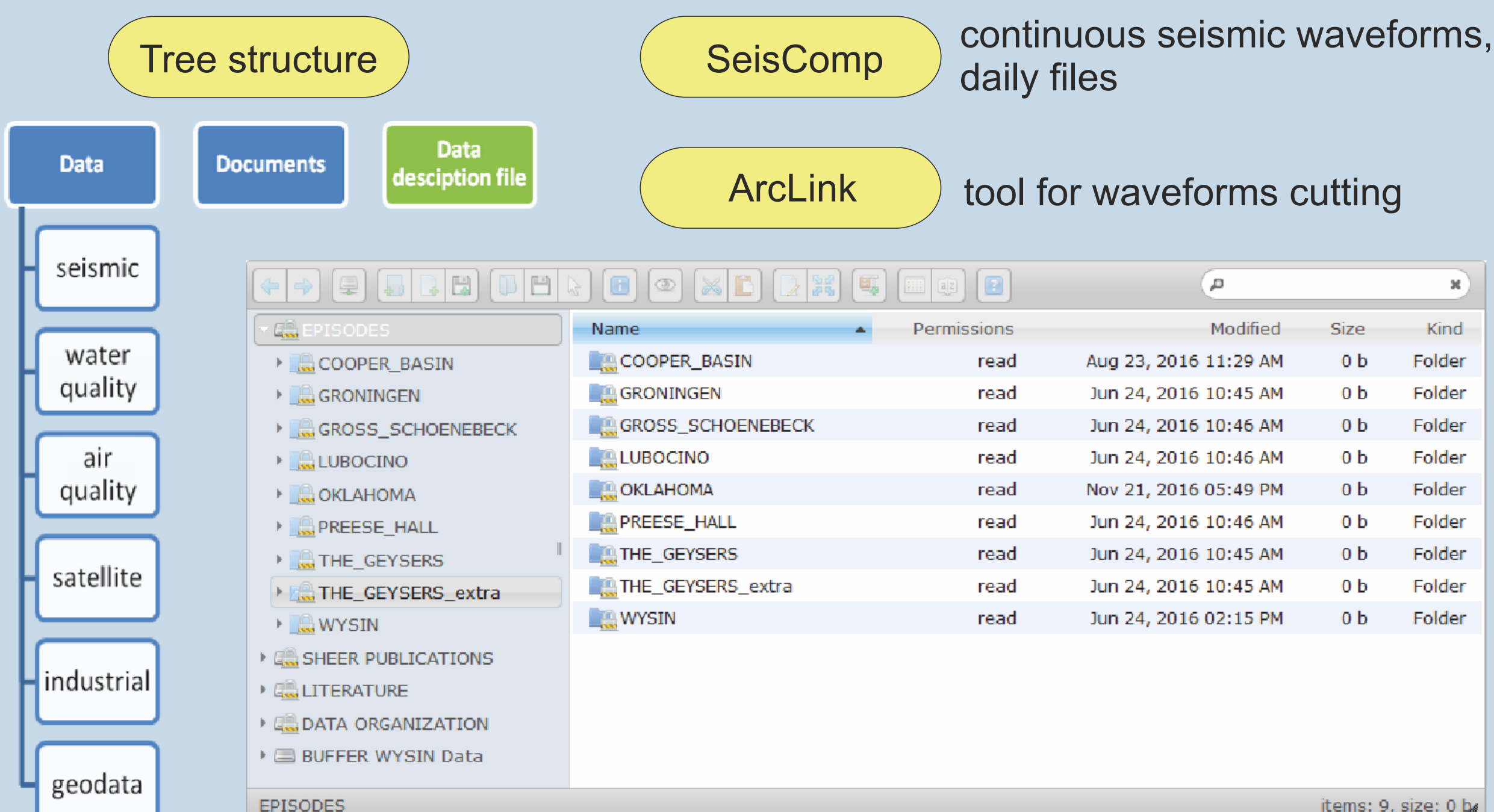


Figure 1. SHEER Database view via institutional account.

#### CONTENTS

Table 1. SHEER Database contents. Episodes marked with purple were additionally added to the database.

Inducing Technology	Episode Name	Case Type	Data Type					Geo-data
			Seismic	Water quality	Air quality	Satellite	Industrial	
Unconventional hydrocarbon extraction	WYSIN Shale Gas	Present case study	X	X	X	X	X	X
	LUBOCINO Shale Gas	Past case study		X		X	X	
	PREESE HALL Shale Gas	Past case study	X				X	X
	OKLAHOMA	Past case study	X				X	X
Conventional hydrocarbon extraction	OKLAHOMA	Past case study	X				X	X
	GRONINGEN FIELD	Past case study	X			X	X	X
Geothermal energy production	GROSS_SCHOENEBECK experiment	Past case study	X				X	X
	THE_GEYSERS	Past case study	X				X	X
	THE_GEYSERS (NW part)	Past case study	X				X	X
Wastewater injection	COOPER_BASIN experiment	Past case study	X				X	
	OKLAHOMA	Past case study	X				X	X

### CIBIS: IG PAS Node

Integrated data (harmonized and homogenized)

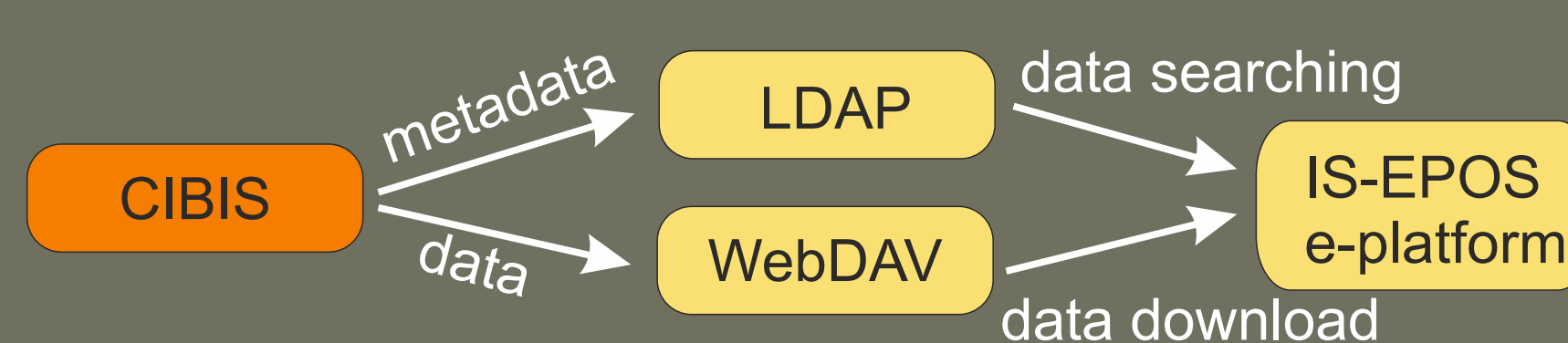
- collects and manage sdata associated with induced seismicity from external suppliers,
- administrates the resources and users,
- shares the system remotely with TCS AH.

Data formats homogenization  
 Seismic / ground motion catalogue - mat  
 Seismic / ground motion network - inventory xml/mat: GDF  
 Seismic event-related waveform - SEED  
 Seismic continuous waveform - miniSEED  
 Air quality / water quality / satellite / industrial / geodata - mat: GDF/MDDF (depends on the complexity of data)

#### Metadata preparation

Figure 2. Metadata preparation in CIBIS software.

#### Episode publication to IS-EPOS platform



## Acknowledgements

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### IS-EPOS Platform (service of TCS-AH e-platform)

Integrated data download, visualization and analysis

Access via browser (<https://tcs.ah-epos.eu/>) through personal accounts.

#### EPISODES

Atime-correlated comprehensive collection of geophysical data representing the geophysical process, technological data representing the technological activity, which is the cause of this process and all other relevant geodata describing the environment, in which the technological activity and its result - the geophysical process, takes place

Figure 3. Episodes view in IS-EPOS platform.

#### APPLICATIONS

Problem-oriented software for geophysical data processing and anthropogenic hazards assessment

Figure 5. Time dependent hazard service view in personal User's Workspace.

Figure 4. Data visualization tools in IS-EPOS platform.

#### SOCIAL FUNCTIONS

Gross Schoenebeck catalog

- ADD TO WORKSPACE AS LINK
- ADD TO WORKSPACE AS LINK IN LOCATION
- ADD TO WORKSPACE
- ADD TO WORKSPACE IN LOCATION
- SHOW FILE INFORMATION
- DOWNLOAD
- SHARE
- UPLOAD
- COPY
- CREATE LINK
- RENAME
- DELETE

Figure 6. Data download and sharing functions in IS-EPOS platform.