



I REACT

IMPROVING RESILIENCE TO EMERGENCIES THROUGH
ADVANCED CYBER TECHNOLOGIES

Report on Design of Data Interfaces

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1 INTRODUCTION

1.1 PURPOSE OF THE DOCUMENT

The goal of this document is to provide an overview of the multiple data sources that will be used in the I-REACT project. Each data source will be described from a technical perspective, focusing on the different formats that are required to process the data. The analysis of these formats is useful to design proper data interfaces that have to be integrated in the I-REACT Data Layer. More specifically, this document covers the following topics:

- Description of multiple data sources that will be referenced by the I-REACT modules;
- Technical specifications of the data formats to process;
- Description of the I-REACT data interfaces for multiple data formats and external services;
- Description of the I-REACT data format for in-app data exchange;
- Draft the guidelines for apps and services integration.

1.2 STRUCTURE OF THE DOCUMENT

The document is organized as follows:

- **Chapter 1** is this introduction and description of the document itself.
- **Chapter 2** provides a high-level description of the multiple data sources, along with technical specifications on the data that can be collected.
- **Chapter 3** contains an in-depth analysis of the data formats considered in the design of the interfaces. The analysed formats derive from the study on the data sources, reported in the previous chapter.
- **Chapter 4** reports the results of the study on the data formats described in the previous chapter. In particular, after deriving all the requirements necessary to process the multiple formats, the specifications of the data interfaces are then described.

1.3 ACRONYMS LIST

ABCIS	Ispra Atmosphere Biosphere Climate Integrated Monitoring Station of the JRC
Aoi	Area of Interest
ASAR	Advanced Synthetic Aperture Radar
CBS	Commission for Basic Systems
CC BY-SA	Creative Commons Attribution-ShareAlike
CFS	Climate Forecast System
CMIP5	Coupled Model Intercomparison Project Phase 5
CO	Confidential, only for members of the consortium (including the Commission Services)
CSV	Comma Separated Values
DTD	Document Type Definition
ECMWF-ENS	European Centre for Medium-Range Weather Forecasts
EDGAR	Emissions Database for Global Atmospheric Research
EEA	European Environment Agency
EFAS	European Flood Awareness System
EFFIS	European Forest Fire Information System
EM-DAT	Emergency Events Database
EMS	Emergency Management Service
ENVISAT	Environmental Satellite
EODC	Earth Observation Data Centre
ERS	European Remote-Sensing Satellite
ESA	European Space Agency
ESDAC	European Soil Data Centre
ESRI	Environmental Systems Research Institute
EU	European Union
FLD	Flood
FTP	File Transfer Protocol
FWI	Fire Weather Index
GADM	Global Administrative Areas
GCM	General Circulation Model
GDS	Grid Description Section
GIS	Geographic Information System
GLAMEPS	Grand Limited And Ensemble Prediction System
GPS	Global Positioning System
GRD	Ground Range-Detected
GRIB	Gridded Binary
HTTP	Hypertext Transfer Protocol

IW	Interferometric Wide
JPG	Joint Photographic Experts Group
JRC	Joint Research Centre
JSON	JavaScript Object Notation
KML	Keyhole Markup Language
Lat.	Latitude
Lon.	Longitude
LUISA	Land-Use based Integrated Sustainability Assessment modelling platform
MASL	Meters Above Sea Level
N.A.	Not Available
NetCDF	Network Common Data Form
NMME	North American Multi-Model Ensemble
NWP	Numerical Weather Prediction
ODbL	Open Data Commons Open Database License
OSM	OpenStreetMap
OSMF	OpenStreetMap Foundation
PDS	Product Definition Section
PNG	Portable Network Graphics
POI	Point Of Interest
PP	Restricted to other programme participants (including the Commission Services)
PR	Private
PU	Public
QGIS	Quantum GIS
RDF	Resource Description Framework
RE	Restricted to a group specified by the consortium (including the Commission Services)
RBD	River Basin District
RPC	Remote Procedure Call
SAFE	Standard Archive Format for Europe
SAR	Synthetic Aperture Radar
SGDRC	Sub-Group on Data Representation and Codes
SHP	Shapefile
TIFF	Tagged Image File Format
TUWien	Technische Universität Wien
UCAR	University Corporation for Atmospheric Research
URI	Universal Resource Identifier
WCS	Web Coverage Service
WFD	Water Framework Directive

WFS	Web Features Service
WML	Wireless Markup Language
WMO	World Meteorological Organization
WMS	Web Map Service
WMS-T	WMS with time support
WPI	Water Pressure Indicators
WS	Wide Swath
XDR	eXternal Data Representation
XML	Extensible Markup Language

1.4 REFERENCE AND APPLICABLE DOCUMENTS

ID	Title	Revision	Date
[RD01]	D2.3 - Report on Design of Data Interfaces	1.0	10/10/2016
[RD02]	De Groeve, T., Poljansek, K., Ehrlich, D., Corbane, C. (2014): Current status and Best Practices for Disaster Loss Data recording in EU Member States. A comprehensive overview of current practice in EU Member States. JRC Scientific and Policy Reports. EUR 26879 EN. Luxembourg. doi: 10.2788/18330		
[RD03]	http://opendatacommons.org/licenses/odbl		
[RD04]	http://wiki.osmfoundation.org/wiki/Main_Page		
[RD05]	http://www.unidata.ucar.edu/		
[RD06]	https://tools.ietf.org/html/rfc4506		
[RD07]	http://www.wmo.int/pages/prog/www/WMOCodes/Guides/GRIB/GRIB1-Contents.html		
[RD08]	http://www.wmo.int/pages/prog/www/WMOCodes/Guides/GRIB/GRIB2_062006.pdf		
[RD09]	http://weather.mailasail.com/Franks-Weather/Grib-Message-Text		
[RD10]	https://avro.apache.org		