

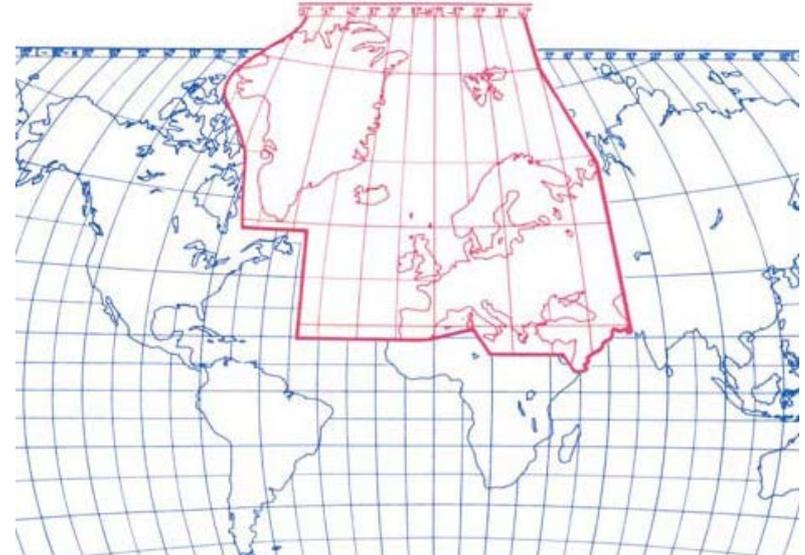
An inter-operable knowledge data base for regional weather and climate events

Maya Körber,
Andreas Walter,
Karsten Friedrich



Outline

- WMO Climate Watch System
- Knowledge Data Base KRONER
 - Input data
 - Data model
 - Data base architecture
 - Contents
 - Extreme events viewer
- Summary and outlook



WMO Regional Association VI
Europe and Middle East

The WMO Climate Watch System **provides advisories and statements to inform users** (particularly those involved in natural hazards preparedness, mitigation and response) **about evolving or foreseen climate anomalies.**

Climate Watch Advisory



Guidance on **above-normal temperature and drought**

Area concerned: Iberian Peninsula

Initial statement issued on 08 May 2015

First update issued on 22 May 2015

Valid: **Begin:** on 23 May 2015 **End:** 31 May 2015

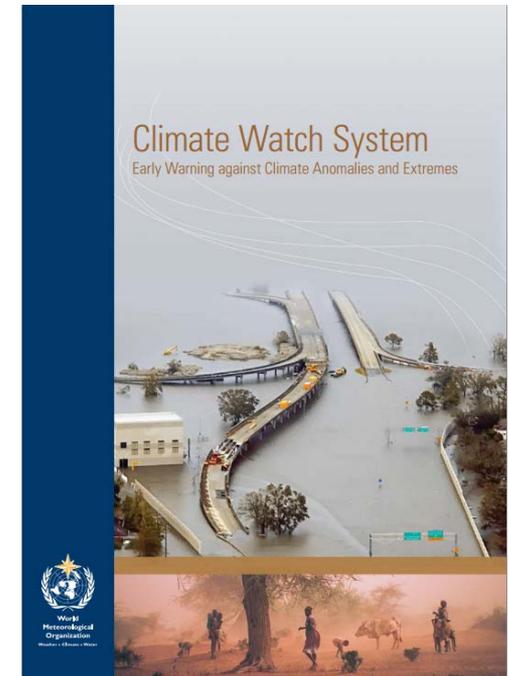
To: Climate Watch focal points of NMHSs Portugal, Spain

The RA VI RCC Network Offenbach Node on Climate Monitoring (RCC-CM) is responsible for providing Climate Watch guidance information for NMHSs' own consideration for issuing climate advisories for their territory.

After having consulted the consortium partners of the RCC-CM and RCC-LRF (RA VI RCC Network Toulouse and Moscow Node on Long-Range Forecasting), RCC-CM issues the following guidance information:

Due to the recent weather situation (current above normal temperatures and low precipitation in parts of South-Western Europe) and the results from monthly forecast we expect the continuation of

"A period with (significantly) above normal temperatures and a drought situation at least for the next week is expected for southern Portugal and southern Spain. The anomalies are forecasted with 3 - 6 °C. The probability for this anomaly is estimated to be between 80% and 90%."



KRONER - Knowledge database on European climate extremes

- Collection of extreme weather events in Region RA VI
- Cold spells, heat waves, heavy rainfall, floods, droughts, wildfires, landslides, snowslides, storms
- Data collection establishes relation between weather extremes and related damage
- Support of NMHSs with regard to climate watch

Data collection contents

- ➔ Approx. 10.000 events, based on various sources
- ➔ Description of events e.g. by category of event, begin, end and duration, damage, affected region, triggering pressure systems, observed anomalies and extremes, source and reference of original data, geographic description (point, line, polygone)

Begin	End	Country	Duration (days)	Category	Description	# Killed (esti...)	Country Code	Affected regio...	Damage (US..)	# Displaced (..)	Cyclone, Anti...	Last update
2007-06-01	2007-06-30	Turkey	30	Heat		3	TR		0	0		2011-11-07
2007-06-01	2007-07-31	Cyprus	61	Heat		4	CY		0	0		2011-11-07
2007-06-01	2007-07-31	Greece	61	Heat		16	GR		0	0		2011-11-07
2007-07-01	2007-07-31	Hungary	31	Heat		500	HU		0	0		2011-11-07

Input data

- International Disaster Database (EM-DAT)
- Dartmouth Flood Observatory (DFO)
- Extreme weather archive (Karlsruhe Institute of Technology, KIT)
- Global Disaster Identifier Number Database (GLIDENumber)

Derived geographical information

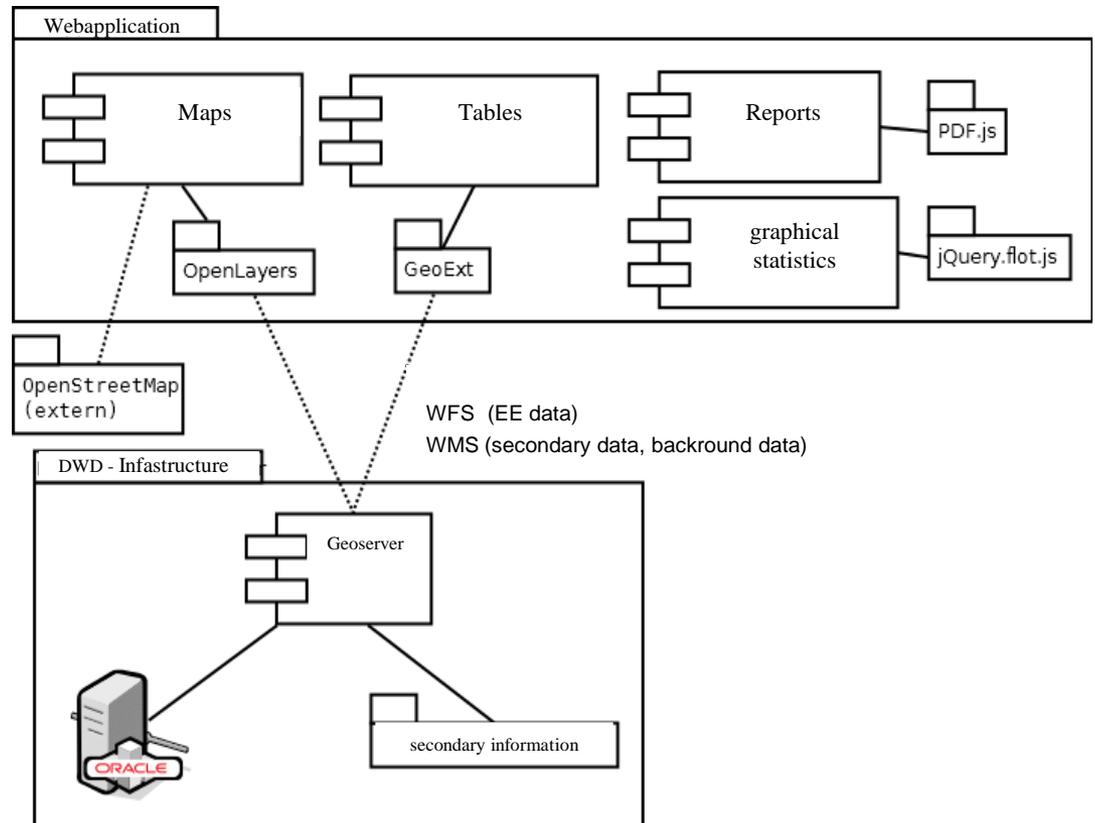
- ➔ DFO data contents geographical information
- ➔ Cold spells and heat waves: Reanalysis data NCAR
- ➔ Drought: Drought monitoring of DWD
- ➔ Heavy rainfall: GPCC
- ➔ Wildfires: ATSR World Fire Atlas



Heat wave August 2003 - Europe

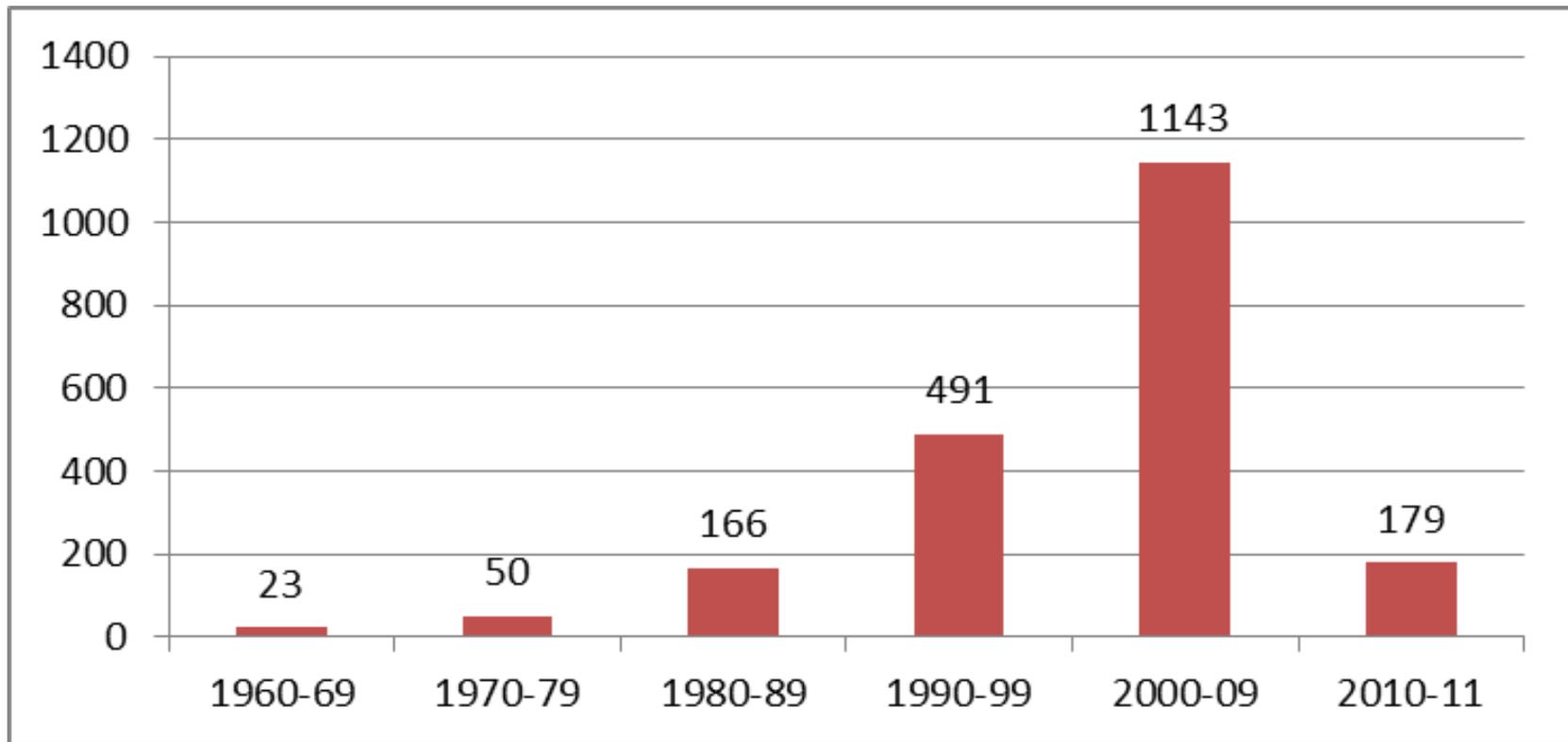
Data base architecture

- implemented in PostgreSQL-database with PostGIS expansion
- Access via GEOSERVER (WFS/WMS)
- Edit events by scripts or with QuantumGIS



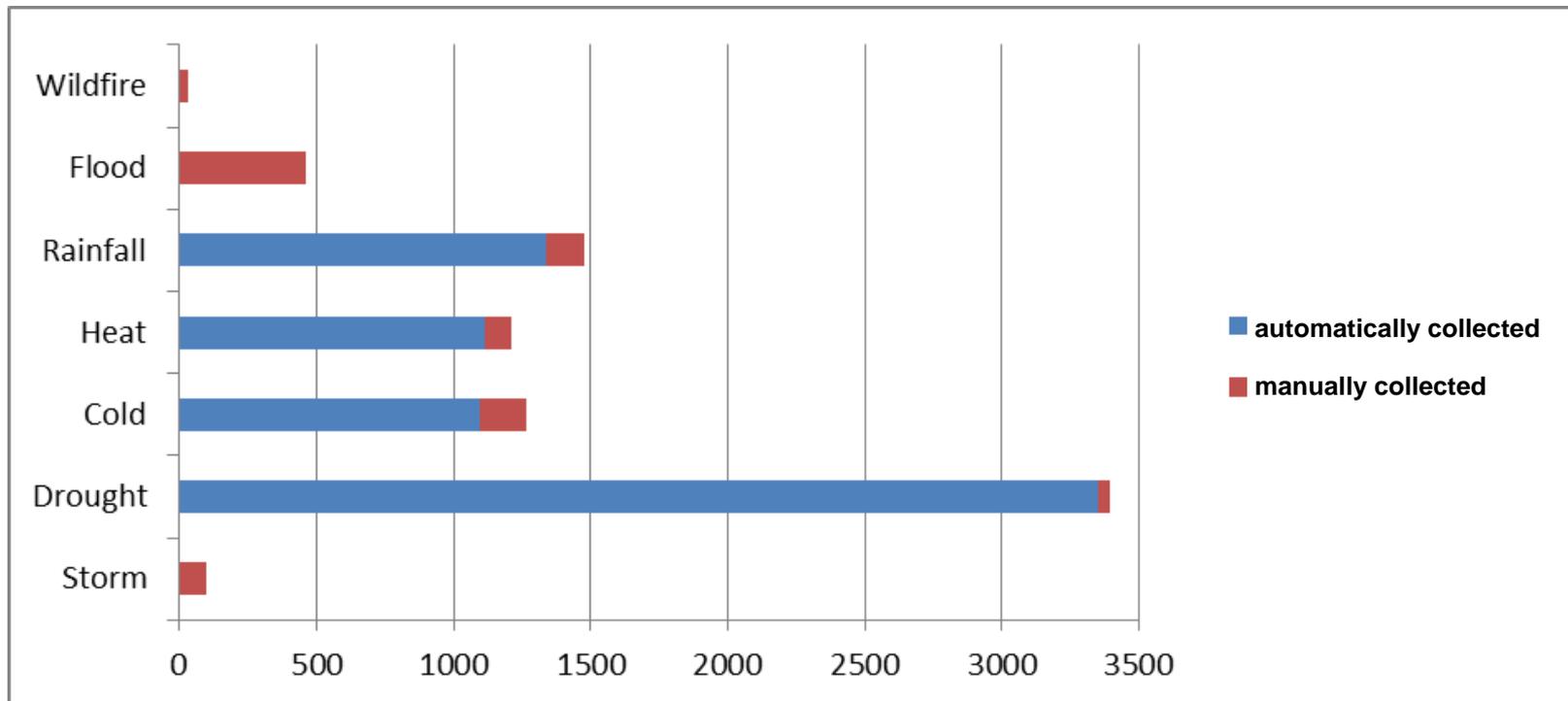
Frequency of event occurrence

Period 1960-2011, 1. project phase

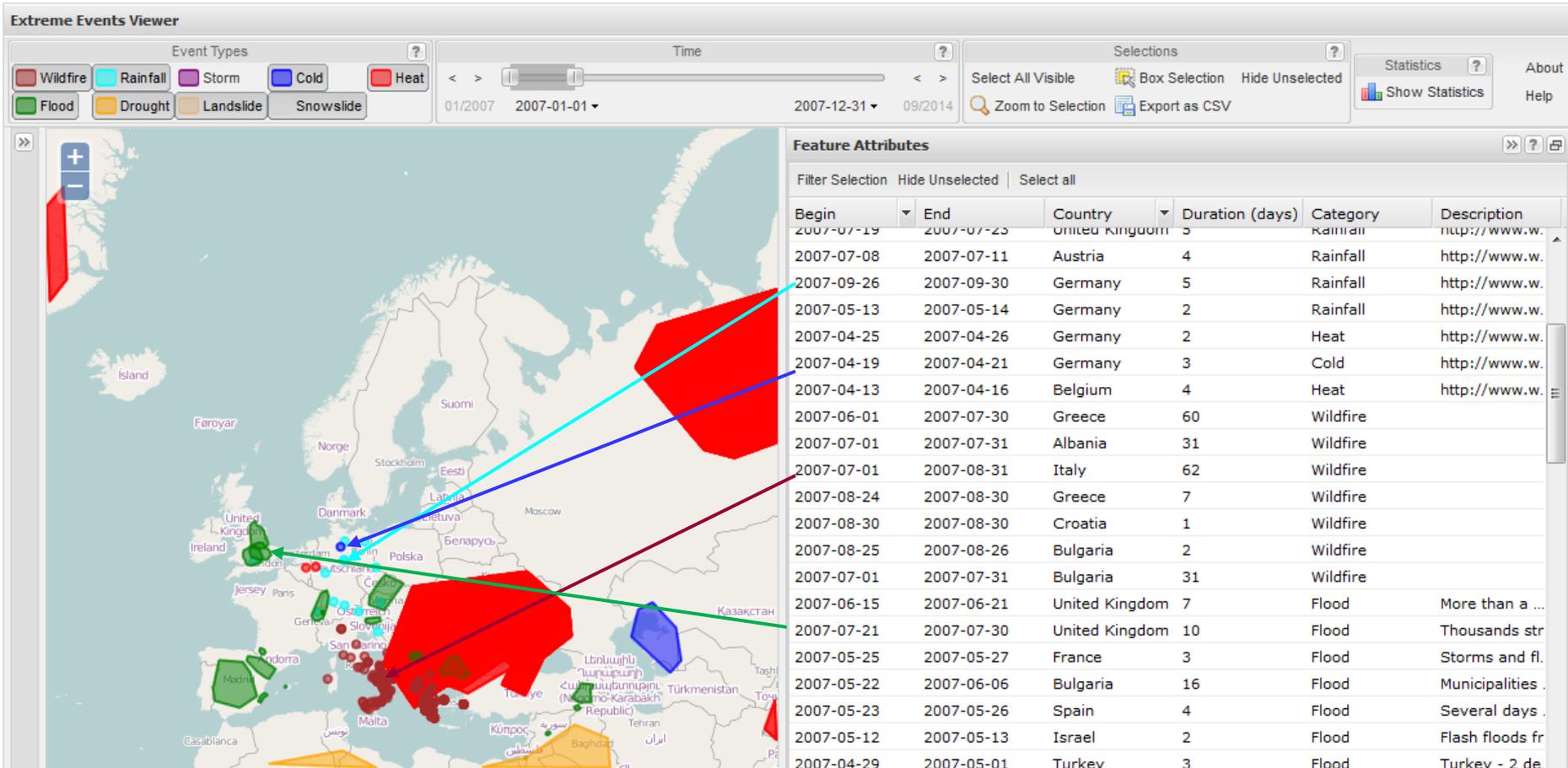


Frequency of event occurrence

Period 1900-2013, 2. project phase



Extreme Events Viewer - Extreme events in 2007



Extreme Events Viewer - Details

Extreme Events Viewer

Event Types: Wildfire, Rainfall, Storm, Cold, Heat, Flood, Drought, Landslide, Snowslide

Time: 01/2007, 2007-01-01, 2007-12-31, 09/2014

Selections: Select All Visible, Box Selection, Hide Unselected, Zoom to Selection, Export as CSV

Statistics: Show Statistics, About, Help

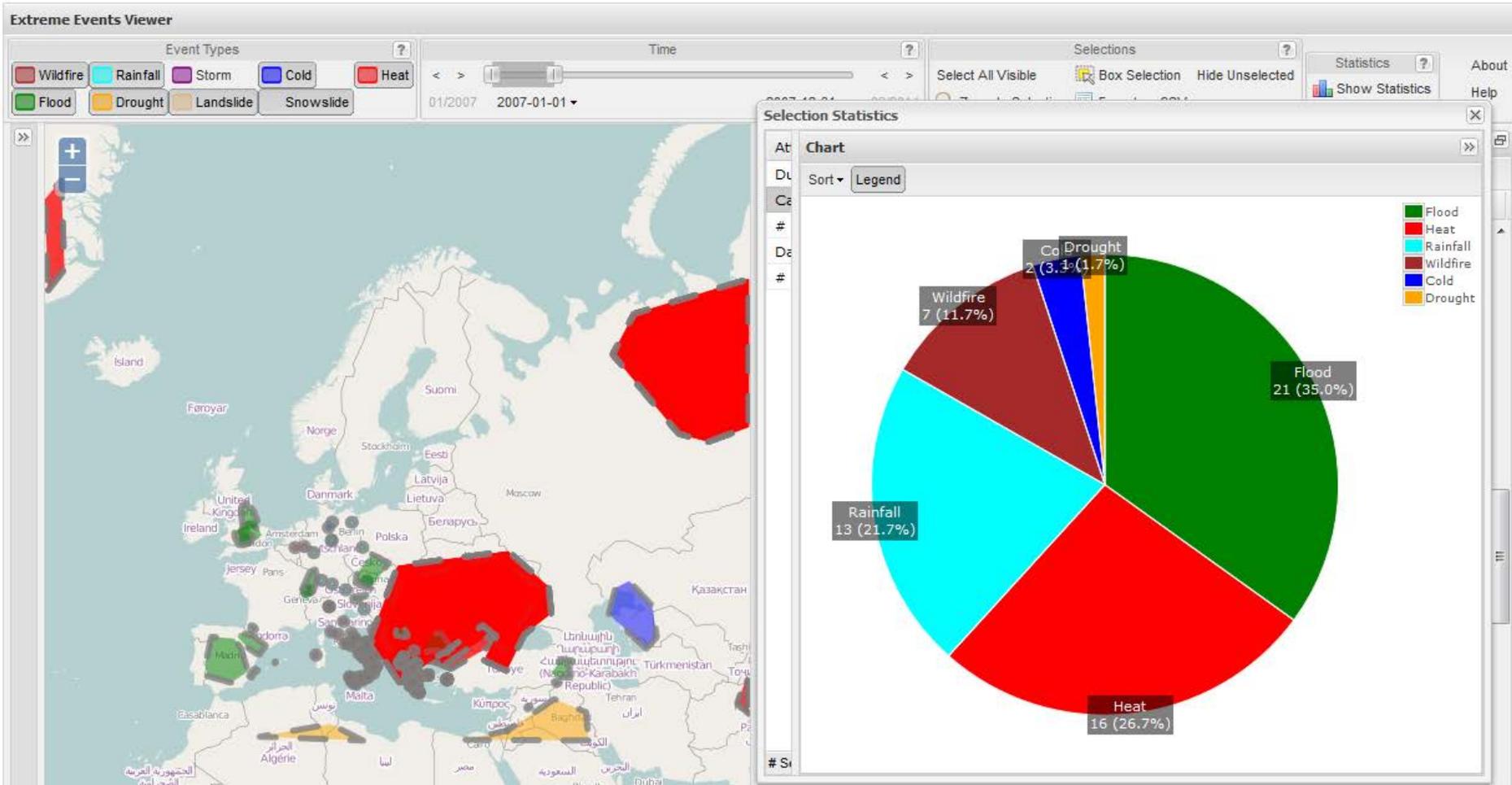
Feature Details EEVIEW_EERPOL.fid--1a86b15c_148b5ca38f2_-96c

Identifier: 2007-1356-GB
 Reference: 1112
 Geometry ID:
 Area of interest (definition of extent): flooded area, provided by Dartmouth Flood Observatory
 Origin of event: dfo
 Geometry type: polygon
 Systematic: 0
 Collection:
 Category: Flood
 Category in source dataset:
 Begin: 2007-07-21T00:00:00Z
 End: 2007-07-30T00:00:00Z
 Duration (days): 10
 Description: Thousands stranded by floods in central and western England after four days heavy rain. Worst flooding in 60 years. 340,000 people and 10,000 homes and businesses affected by flooding. Wettest May through July in England and Wales since records began in 1766. \$6.5 billion in insurance damages."This emergency is far from over and further flooding is extremely likely" "Some rivers are already 20ft above normal levels"Thousands trapped in their homes. People airlifted in one of RAF's biggest peacetime operations.130,000 homes flooded. Tewkesbury and Upton on Severn - towns cut off by floodwaters.Oxford - 1,500 evacuated. Thames 4 inches above 1947 flood level.

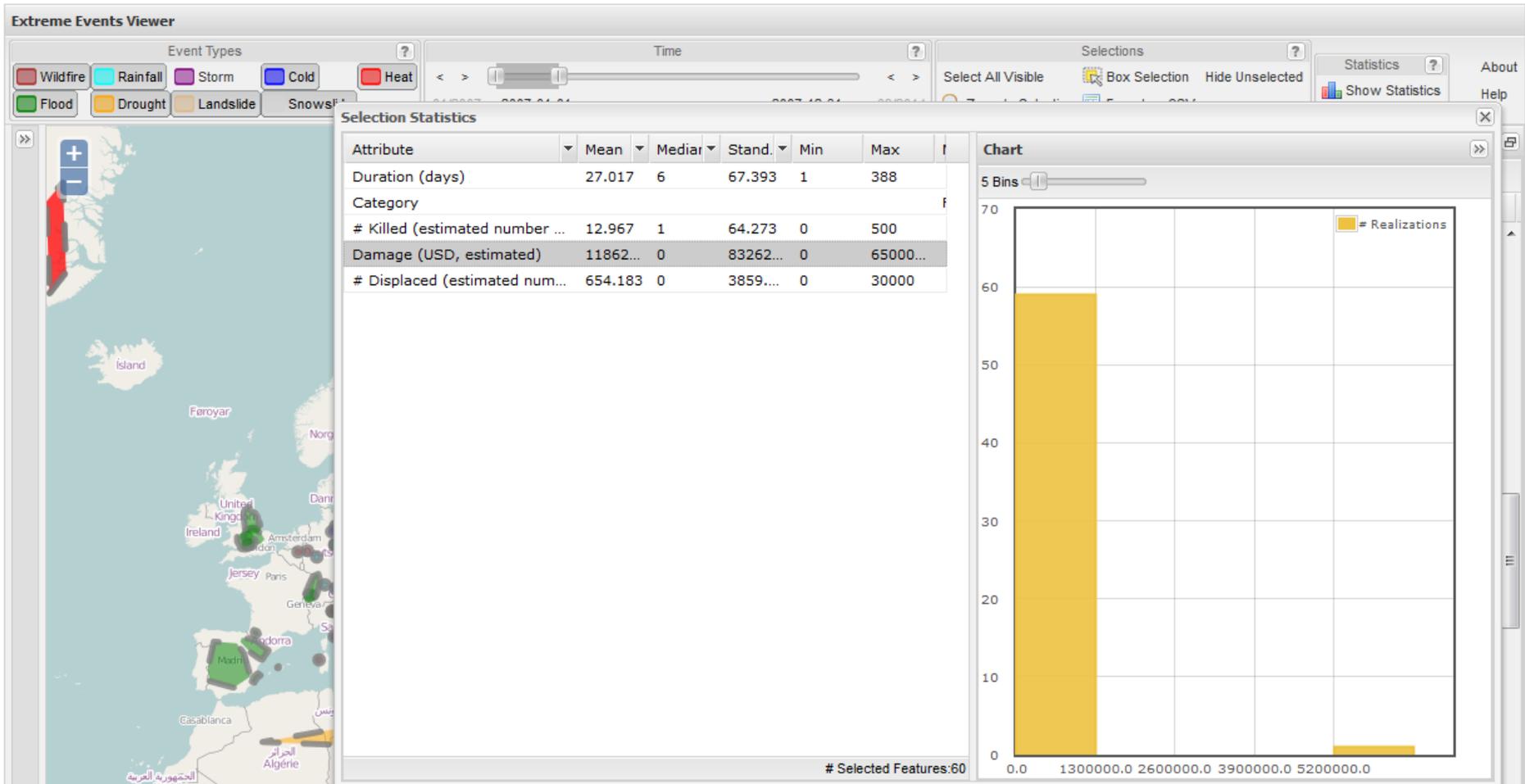
Country	Duration (days)	Category	Description	
7-30	Greece	60	Wildfire	
7-31	Albania	31	Wildfire	
3-31	Italy	62	Wildfire	
3-30	Greece	7	Wildfire	
3-30	Croatia	1	Wildfire	
3-26	Bulgaria	2	Wildfire	
7-31	Bulgaria	31	Wildfire	
3-21	United Kingdom	7	Flood	More than
7-30	United Kingdom		Flood	Thousands
3-27	France		Flood	Storms and
3-06	Bulgaria		Flood	Municipality
3-26	Spain		Flood	Several da
3-13	Israel		Flood	Flash flood
3-01	Turkey		Flood	Turkey - 2
1-08	Spain		Flood	Heavy rain
3-10	Czech Republic	5	Flood	Czech Rep
3-11	Romania	7	Flood	Tecuci tow
3-27	Romania	3	Flood	Overnight
3-08	Bulgaria	4	Flood	Heavy rain
3-18	Spain	7	Flood	Alicante -
2-31	Moldova, Rep...	365	Drought	



Extreme Events Viewer - Statistics



Extreme Events Viewer - Statistics



Summary and outlook

- Already extensive data sets in various data collections available including information about damage and loss
- Merging different information sources and adding geographical information to allow regional searches
- Fewer data available with extended observation period → systematic collection of events desired
- Data access via webclient (NMHSs)
- Export- and statistical functions

- Particular attention to knowledge database within WMO TT-DEWCE
- Possible spatial extension in future projects (e.g. Africa)

Thank you for your attention

Maya Körber
Deutscher Wetterdienst
Regional Climate Monitoring
Frankfurter Straße 135
63067 Offenbach

E-Mail: maya.koerber@dwd.de
Tel.: +49 (0) 69 / 8062 -2941
Fax: +49 (0) 69 / 8062 -3759

