Emergency Response Scenario

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1 Scenario

In October 2006 3 days heavy rain caused floods in Scotland. It stopped raining in 28 October, and several places in the area of Highlands (Scotland - Highlands area - Dingwall, Evanton, Alness, Tain. Caithness, Sutherland, Easter Ross, Moray Firth) were affected (2299,58 km in total) and one person died.

We are considering emergency response situations 1) during the heavy rain, when the main goal is to search for vulnerability and rescue, 2)after the rain, when the main goal is recovery. Based on that categorisation, we will analyse two case studies: 1) search for water bodies that are in risk of flooding, so to evacuate the area, 2) search for special protected areas that have been affected, and proceed to a recovery plan.

1.1 Datasets

Global Active Archive of Large Flood Events from Dartmouth Flood Observatory (DFO). This dataset contains all the disater related information, Table 1.

Special Protection Areas (SPA) from Scottish Natural Heritage, contains information about areas of the most important habitat for rare. Some entries are presented in Table 2.

Water Bodies from SEPA contains the information of the water bodies described by the fields presented in Table 3.

2 Mismatches

Case Study 1: Searching for water bodies In order to search for water bodies, we need to provide the exact location of the disaster. However, the two agencies do not use the same specification: DFO uses "country" and "detailed locations", while SEPA uses "river basin district". Also, the level of abstraction between these specifications is not the same: "river basin district" indicates the greater area the river belongs to, and is either Scotland, or Solway Tweed.

Another way to provide the location of the disaster, is to search the coordinates of the location. At this point we encounter two problems. First of all, the two agencies use different specifications: centroid x - centroid y (DFO), lat-long (SEPA). Secondly, since the location that we are interested in corresponds to more than one areas, a single pair of coordinates is not possible to cover the whole affected location.

We observed, that often the "team" field (SEPA), reveals information about the water body location. For example, we find teams such as North Highland, and Moray Firth.

Country	UK
Other	0
Nations	0
Affected	0
Detailed locations	Scotland Highlands arthatea,Dingwall,Evanton,Alness,Tain,Caithness,Sutherland,Easter Ross,Moray Firth
Validation Per Event	0
Began	26-Oct-2006
Ended	28-Oct-2006
Duration In Days	3
Dead	1
Main Cause	Heavy rain
Severity	2
Affected Km	2299,58
Magnitude	
Centroid x	-4,18
Centroid y	57,7
Date Began	26-Oct-2006

Table 1: DFO dataset

Area	1704926.64143	1656630.17831	478181.86893
Perimeter	12461.11455	22047.21561	7229.8658
PA Code	8515	8554	8559
Site Name	Inner Moray Firth	North Caithness Cliffs	North Sutherland Coastal Islands
Site Ha	2339.25	14621.14	221.12
Status	SPA	SPA	SPA
Eur Code	UK9001624	UK9001181	UK9001211

Table 2: Special Protection Areas dataset

Case Study 2: Searching for protected areas As we can see in the SPA dataset, the only information[1] that we have about the location of the area is the site name. So, to identify it, we need to know for each site name, whether belongs the affected location.

Knowing that Moray Firth is divided into two firths, we have identified entries for Inner Moray Firth. Also, entries for North Caithness Cliffs, East Caithness Cliffs, Caithness Lochs, which belong to Caithness. Finally there are entries for the North Sutherland Coastal Islands area which is part of Sutherland.

[1]There is a parameter called area, described by numbers. However, I was unable to identify what it represents

Water Body Id
Category
Water Body Name
Length Km
Rbd Code
River Basin District
Sbd Code
Sub Basin District
Is Heavily Modified
Is Artificial
Genre
Easting
Northing
Lat
Long
Catchment Id
Catchment
River Number
River Name
Team
Status Risk Assessment
No Det Risk Assessment
Current Overall Classification
Classification Certainty
Classification Certainty Band
Is Less Than Good
Current Classification Year
Target Class
Associated Ground Water Id
Associated Groundwater
Wise Code
Eco Region
Data Source
Altitude Typology
Size Typology
Geology Typology

Table 3: SEPA dataset fields