Flood mapping in the Danube RBD

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EFD Art 6

- Member States shall, at the level of the river basin district, or unit of management referred to in EFD Article 3(2)(b), prepare flood hazard maps and flood risk maps, at the most appropriate scale for the areas identified under EFD Article 5(1);

- The preparation of flood hazard maps and flood risk maps for areas identified under EFD Article 5 which are shared with other Member States shall be subject to prior exchange of information between the Member States concerned.
ICPDR response

• The FP EG agreed that flood risk mapping under the ICPDR will be only done on the basin wide level (level A).

• The report to the EC will contain references/links to the outcomes of the relevant projects (Floodrisk) and to the activities carried out in sub-basins (e.g., ISRBC).

• The recommendations of the draft EU document "Reporting of spatial data for the Floods Directive (Part II); Guidance on reporting for flood risk and hazard maps of spatial information" were used by the FP EG for the first proposal of level A maps for DRBD.
Examples of the risk maps were provided by countries before the 22\textsuperscript{nd} FP EG meeting in September 2012.

For the Map of hazard and flooding scenarios the IM/GIS EG at its meeting asked the countries to provide test data of flood scenarios by mid August 2012, so the Secretariat could prepare examples for further discussion on this map.

The examples of maps were presented and discussed at the ICPDR flood risk mapping workshop on 26-27 September 2012. For all map preparation activities a close cooperation with the IM/GIS EG was essential.
Flood hazard maps
Danube River Basin District: Risk and economic activity - 1000 Years Scenario

Map showing the Danube River Basin District with various symbols and colors indicating different categories such as Competent authority, National borders, Cities, percentage share of total losses, Agriculture, Urban areas, Industry, Infrastructure, Danube River Basin District (DRBD), Danube River, Tributaries (with catchment area > 4,000 km²), Lake water bodies (with surface area > 100 km²), Transitional water bodies, Coastal water bodies, Canals, and scale 1:4,500,000.

Legend:
- Competent authority
- National borders
- Cities:
  - 100,000 - 250,000 inhabitants
  - 250,000 - 1,000,000 inhabitants
  - > 1,000,000 inhabitants

SCALE 1: 4,500,000

This ICPDR product is based on national information provided by the Contracting Parties to the ICPDR (AT, BA, BG, CH, CRO, HR, HU, MD, RO, RS, SI, SK, UA) and EU, except for the following: EuroGeographics was used for national borders of AT, C2, DE, HR, HU, MD, RO, RS, SI, SK and UA; OSN data was used for national borders of AL, ME, MK. Shuttle Radar Topography Mission (SRTM) from USGS. Seamless Data Distribution System was used as topographic layer; data from the European Commission Joint Research Centre was used for the river border of the DRBD of AL, AT, ME and PL.

Vienna, September 2012

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Danube River Basin District: Risk and Population

LEGEND:
- Population affected by floods with high probability
- Population affected by floods with medium probability
- Population affected by floods with low probability
- Danube River Basin District (DRBD)
  - Danube River
  - Tributaries (with catchment area > 4,000 km²)
- Lake water bodies (with surface area > 100 km²)
- Transitional water bodies
- Coastal water bodies
- Canals

Cites:
- 100,000 - 250,000 inhabitants
- 250,000 - 1,000,000 inhabitants
- >1,000,000 inhabitants

Scale: 1:4,500,000 (All landscape sizes format)

This ICPDR product is based on national information provided by the Contracting Parties to the ICPDR (AT, BA, BIH, CZ, DE, DK, EL, FI, FR, HU, IE, IT, LD, LV, NL, NO, PL, PT, RO, SE, SK, SI, TR, UK, UA) and, except for the following: GeoScopeMet 3.1 from GeoScope was used for national borders of AT, CZ, DE, DK, EL, FI, FR, HU, IE, IT, LD, LV, NL, NO, PL, PT, RO, SE, SK, SI, TR, UK, UA;

Ebro data was used for national borders of AL, ME, MT, shuttle Radar Topography Mission (SRTM) from USGS Geospatial Data Distribution Systems was used as topographic layer; data from the European Commission (Joint Research Center) was used for the outer border of the DRBD of AT, IT, ME, and Po.

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FP EG agreements

• The FP EG agreed about the content of the following maps:
  • map of hazard and flooding scenarios;
  • map on risk and population;
  • map on risk and economic activity;
  • map on risk and IPPC installations;
  • two maps on WFD protected areas.
MAP 1 Hazard and flooding scenarios

- Rivers with catchment areas >4000km², lakes >100km², transitional and coastal waters will be shown on the map at the level A.

- Two scenarios (floods with medium and low probabilities) for rivers with catchments >4000km² will be shown on one map. The large areas will be displayed as polygons, smaller areas as lines or dots (the same criteria as used for the APSFR map).

- The outlines of polygons should have zero thickness. If no info is available, country’s area will be displayed with a grey overlay. Red color will be used for extreme events and orange color for medium probability floods.
MAP 2 Risk and population

• A4 map using white background and showing country borders, the Danube River and country capitals.

• The number of affected population in each country will be shown by a bar chart with 3 bars per each country (one bar for each scenario). 2D bars will be used, data for high probability scenario will be shown on the left side of the graph and the number of affected population will be indicated on top of the bars. Red color will be used for low probability floods, orange for medium probability floods and yellow for high probability floods.

• Percentage of the affected population has to be shown in a separate table.

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Three A4 maps will be prepared (one for each scenario) using white background and showing country borders, the Danube and country capitals.

Each map should show the percentage of the affected area compared to the total affected area as 2D pie chart for each country (the legend of the map should read: Percentage share of inundated area).

Corine LC colors have to be used in the chart. Clear indication has to be made that data are provided for the part of the country belonging to the Danube River Basin.
MAP 4 Risk and IPPC installations

• A4 map will be prepared using white background and showing country borders, the Danube and country capitals;

• The number of IPPC installations in each country will be shown by a bar chart with 3 bars per each country (one bar for each scenario). 2D bars will be used, data for high probability scenario will be shown on the left side of the graph and the number of IPPC installations will be indicated on top of the bars;

• Red color will be used for low probability floods, orange for medium probability floods and yellow for high probability floods.
Areas designated for the protection of habitats or species (Natura 2000 sites designated under Directive 92/43/EEC and Directive 79/409/EEC);

A3 DRBMP map of protected areas (DRBMP Map 9) will be superposed by a flood hazard map for low probability floods (extreme events) scenario. The overlapping areas will be highlighted.

Map legend will contain an explanation which types of protected areas are displayed.
MAP 5b WFD protected areas

- Drinking water protected areas, bathing and recreational water;
- A4 map will be prepared using white background and showing country borders, the Danube and country capitals;
- The number of affected protected areas in each country shown by a bar chart with 3 bars per each country (one bar for each scenario).
- 2D bars will be used, data for high probability scenario will be shown on the left side of the graph.
• The numbers of affected areas designated for the abstraction of water intended for human consumption under WFD Article 7 and of the affected bodies of water designated as recreational waters, including areas designated as bathing waters under Directive 76/160/EEC will be indicated on top of the bars.

• Red color will be used for low probability floods, orange for medium probability floods and yellow for high probability floods. Possibility will be explored by the Secretariat to distinguish the drinking water and bathing water protected areas within the bars using different raster.
Flood hazard and risk maps

• The outline of a report to the EC on Flood Hazard and Risk Maps was agreed by the FP EG;

• Flood hazard maps have to be submitted via DanubeGIS as shape files in cooperation with the IMGIS EG by 15 February 2013;

• The first drafts of maps will be discussed at the 23rd FP EG meeting on 14-15 March 2013 in Sarajevo;

• The deadline for text contributions to the report to EC using the template prepared by the Secretariat is 1 August 2013.
FLOODRISK project

- The final Floodrisk conference organized on 10/10/2012 in Bucharest – the Danube Atlas has been printed and the electronic version of the maps was presented.

- The web version of the maps will be also available on the ICPDR website - discussion between the Secretariat and the FLOODRISK project team is ongoing on technical details of transferring the maps into the ICPDR server.
Thank you for your attention!

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