



HAZRUNOFF

PROJECT

“Integration of sensing and modelling technologies for early detection and follow-up of hazmat and flood hazards in transitional and coastal waters”

DELIVERABLE 2.1 (Meteorological models implemented in the pilot areas)



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SUMMARIZED DESCRIPTION

HazRunOff project aims to provide adequate forecasts for oil and chemical pollutants in air and water, as well as flood forecasting. All the involved modelling suite needs to be forced with accurate atmospheric model results, properly adapted to the scales and processes studied. For instance, to provide accurate flash flood forecasts, high resolution atmospheric forecasts are needed in the target area, as well as in the neighbourhood areas (tributary areas). Thus, adequate atmospheric forcing is of vital importance to achieve accurate environmental predictions in the HazRunOff's areas of study.

The project includes case studies in Portugal, France and United Kingdom. Although a HazRunOff case study is being applied in Spain (Galicia), adequate atmospheric model forecasts for this region are already publicly available (which means that the project will ingest those models directly, instead of developing new ones). Therefore, atmospheric modelling efforts in HazRunOff have been applied in the remaining areas of study.

A compressed package (zip file) includes the configuration & setup files needed to properly run atmospheric models in 3 of the 4 case studies used in HazRunOff project.

The zip package can be downloaded here:
http://www.hazrunoff.eu/intranet/remote.php/webdav/Deliverables/Modelling/HazRunOff_D2.1_Model%20configuration%20files.zip

The atmospheric modelling software used is the WRF. In all the model implementations, the same nested modelling approach is applied, starting with a parent domain with 9km of spatial resolution (large scale, covering the whole watershed), followed by an intermediate domain with 3km resolution, and finalizing with a 1km spatial resolution

model domain in the target area. All the model domains are available to be used as forcing conditions for HazRunOff models.

An additional note to mention that the provided WRF configuration & setup files are sufficient to allow any modeler to implement the WRF modelling systems using ACTION Server application service – which is the core application to be applied and developed in the scope of HazRunOff decision support tools. WRF running under ACTION Server is possible due to a plugin called WRF Runner Plugin (http://wiki.actionmodulers.com/wiki/index.php?title=Action_Server_-_User_Guide_-_v2.0). The plugin can manage all the pre-processing (ungrib, metgrid, real) and post-processing (export to HDF5 format and index in ACTION Server database). Due to the size of the files involved, boundary and initial modelling conditions (grib files from GFS model) are not provided in this package. They must be obtained seamlessly by ACTION Server with plugin GFS Downloader:

(http://wiki.actionmodulers.com/wiki/index.php?title=Action_Server_-_User_Guide_-_v2.0#GFS_Downloader).

If an advanced modeler desires to implement the developed WRF model configurations outside ACTION Server, the files provided in this package can also be used for that purpose, having in mind that this package includes the WRF generically needed input data files (e.g. namelist.input; namelist.wps; geogrid files for the different domain levels - geo_em.d01.nc; geo_em.d02.nc; geo_em.d03.nc). However, boundary and initial conditions (GFS Grib files) must be properly obtained.

CASE STUDIES

The next table compiles the main characteristics of the WRF model domain configurations implemented in the different case studies

Case study	Portugal			United Kingdom			France		
Domain level	1	2	3	1	2	3	1	2	3
Vertical levels	30	30	30	30	30	30	30	30	30
Nr. XX cells	61	103	70	43	64	70	92	79	88
Nr. YY cells	101	199	58	45	46	79	58	61	64
Center Point XX (Long.)	-7.9885			-3.2			0.13		
Center Point YY (Lat.)	40.02605			51.8			46.61		
Minimum XX	-11.43280	-10.00482	-9.55389	-6.06506	-4.67169	-3.37238	-5.59567	-4.19904	-2.97797
Minimum YY	35.86740	36.77916	38.46361	49.97690	50.97179	51.13480	44.13903	45.16304	45.35763
Maximum XX	-4.54422	-8.16286	-8.73825	-0.33493	-1.86411	-2.35318	5.85568	-2.66735	-1.80640
Maximum YY	44.16685	42.26851	38.99055	53.58820	52.20263	51.85094	48.9555	46.88340	45.96004
Spatial resolution (km)	9	3	1	9	3	1	9	3	1
Temporal resolution (min.)	60	60	60	60	60	60	60	60	60

Table 1 - WRF geographical domains implemented

Portugal

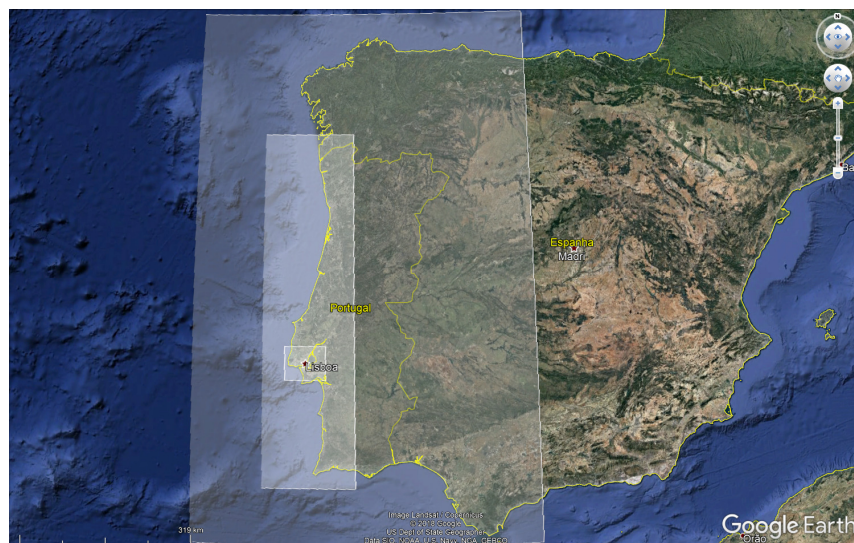


Figure 1 - Approximate geographical position of the 3 nested domains implemented in WRF model, in the Portuguese case study

UK



Figure 2 - Approximate geographical position of the 3 nested domains implemented in WRF model, in the UK case study

France



Figure 3 - Approximate geographical position of the 3 nested domains implemented in WRF model, in the French case study