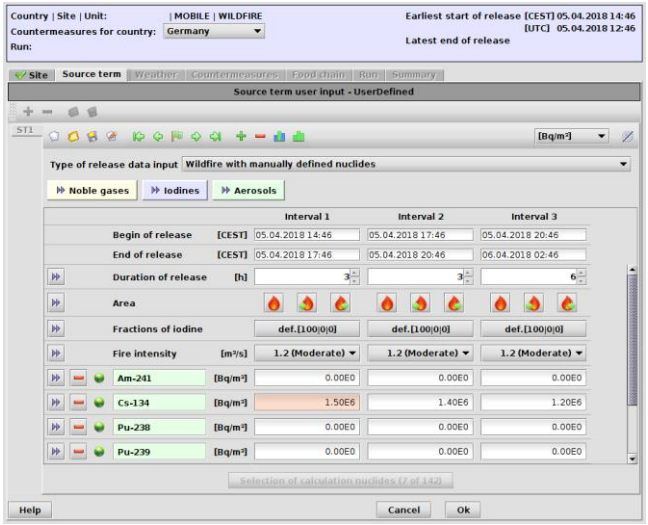
Forest fire module in the JRODOS DSS

- **Objective**: Development of an operational module describing **forest fires** in the **Chernobyl exclusion zone** (ChEZ), providing an **upper bound estimation** of the potential **dose** burden to the population
- Dispersion model LASAT was expanded to deal with **area sources**
- Four classes of wildfire are used: weak, modest, strong and very strong
- **Contamination pattern for Sr and Cs were collected by colleagues from Ukraine for the ChEZ**
- Simple model for the emission rates
  - 20% of labile radionuclides will be redistributed in the atmosphere, no matter whether they are in the soil or biomass; no fire class considered
  - 10% of the other radionuclides will be redistributed in the atmosphere
- Complex model for the emission rates
  - The emission strength of the radionuclides **depends on the fire class** reflecting the different fire temperatures
  - Emission depends further on the **surface properties** in the fire area (14 classes of land use/forest type)

Operation of the forest fire module

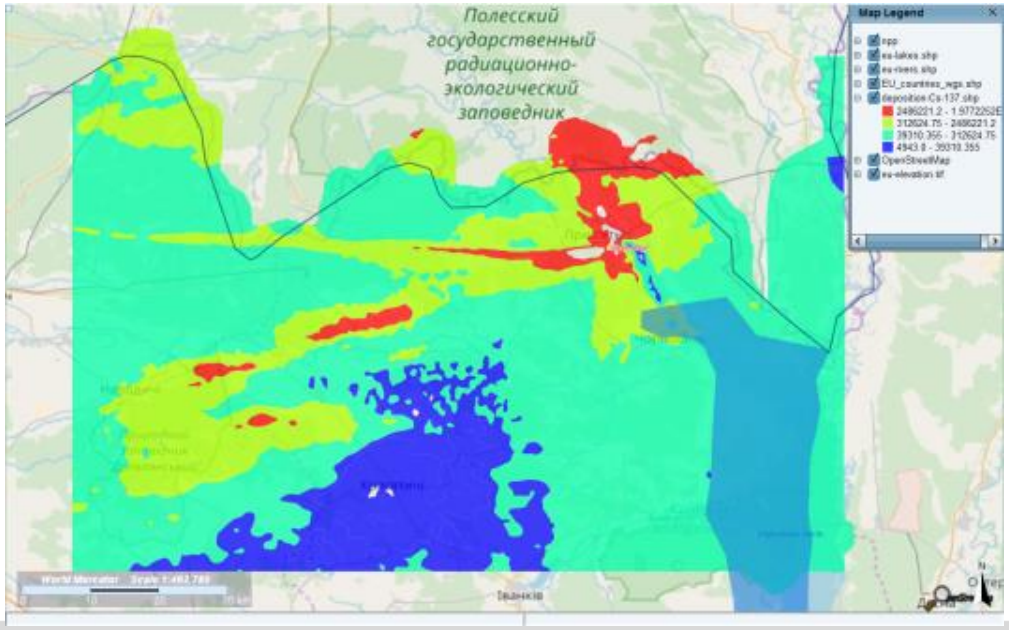
- User interface and contamination maps



Unser interface with all relevant parameters

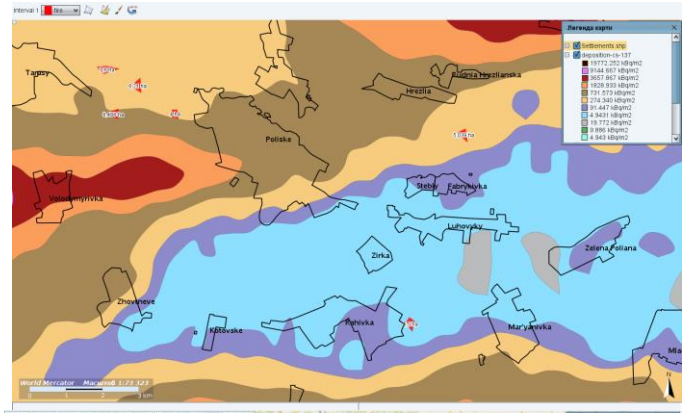
Area source

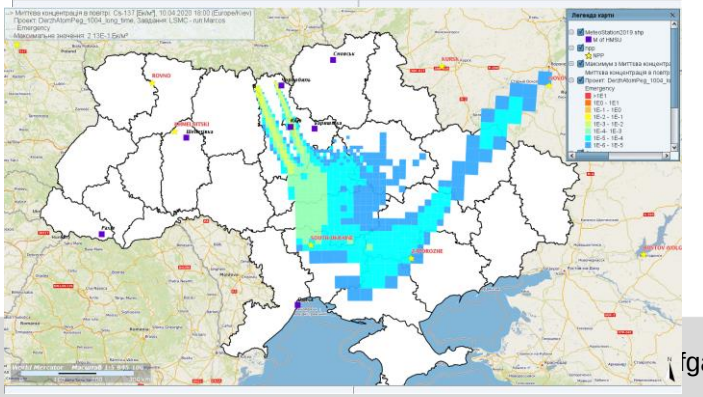
Contamination map Cs-137



Application

- **State Scientific and Technical Center for Nuclear and Radiation Safety (SSTC NRS)** https://sstc.ua/news/prognoz-peremishennya-potencijno-zabrudnenogo-atmosfernogo-povitrya-zumovlenogo-pozhezhami-v-chzv-na-10-11-kvitnya
- **Ukrainian Hydrometeorological Center** has performed assessments for the event from 09.04.20 21:00(Kiev time)
  - **Wildfire duration:** 36 h, **Prognosis duration:** 96h
  - **Total area of wildfire** : approximately 60 ha





Comparison of measured and calculated values the Cs-137 ambient air activity concentrations in the surface layer of the atmosphere that appeared due to a fire in the Chornobyl Exclusion Zone. April 2020.

Measuring point	Start of sampling	End of sampling	Volumetric activity, $\mu Bq*m^{-3}$ calculated	Volumetric activity, $\mu Bq*m^{-3}$ measured
National Hydrometeorological Service of Ukraine				
Kyiv 50.39N, 30.53E	10.04.2020	11.04.2020	726	700
	11.04.2020	12.04.2020	261	170
	12.04.2020	13.04.2020	0	<180
Baryshivka 50.35N, 31.34E	11.04.2020	14.04.2020	26	45
Odesa 46.44N, 30.77E	09.04.2020	12.04.2020	42	48
Snovsk 51.80N, 31.95E	09.04.2020	12.04.2020	49	52
	07.04.2020	10.04.2020	518	380
Chornobyl 51.27, 30.23E	10.04.2020	13.04.2020	454	290
South-Ukraine NPP, Yuzhnoukrainsk 47.81N, 31.22E	07.04.2020	13.04.2020	36	49
Zaporizhzhia NPP, Enerhodar, 47.51N, 34.58E	06.04.2020	13.04.2020	2	8