Federal Office for Radiation Protection

PREDICT

PREDICT Project - Overview

ImPRovements in atmospheric dispErsion moDelllng and proteCTive action strategies in case of nuclear detonations

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EUROPEAN PARTNERSHIP FOR RADIATION PROTECTION RESEARCH
PREDICT

Rome, 11 November 2024

Co-funded by the European Union

Introduction

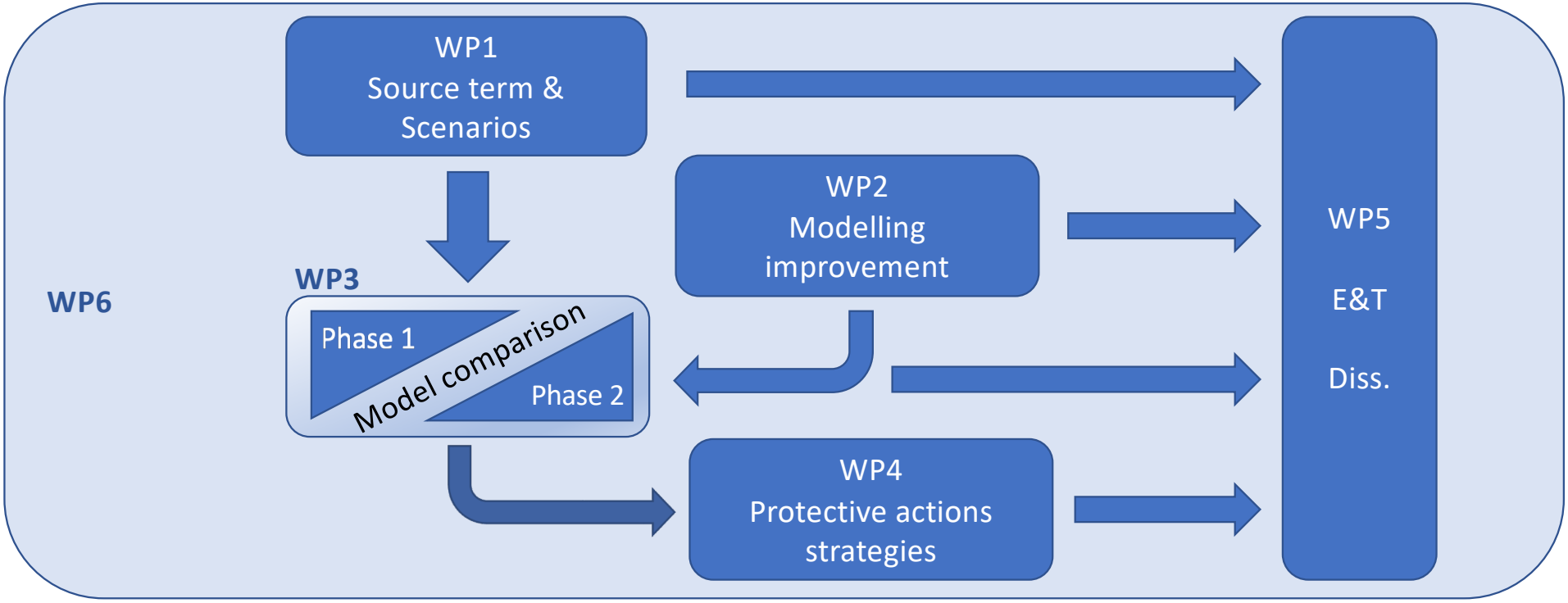
- PREDICT aims to enable the major internationally used decision support systems JRODOS and ARGOS and other nationally used atmospheric dispersion and transport codes and follow-on foodchain models to simulate and predict consequences due to the fallout of a nuclear detonation in Europe or worldwide.
- Duration: 01 February 2024 – 31 January 2027
- 12 partners from seven European countries

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Project structure



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WP 1 – Characterization of airborne radiocontaminants (source term description) (DTU):

- Research into datasets, relevant for atmospheric dispersion modelling for airburst and ground detonation
- What are the main dose-delivering radionuclides, activity-height and particle size distributions?
- Reduce computing time and develop relevant scenarios to be used in other WPs

WP2 – Modelling Improvement (UKHSA):

- Develop scientifically based recommendations for future improvements of atmospheric dispersion and radiological dose assessment models applied to nuclear detonation scenarios



Image: Glasstone and Dolan, 1977

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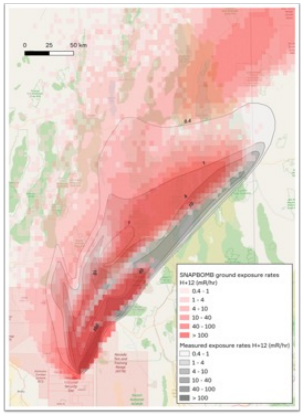
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WP3 – Model Comparison (KIT):

- Model validation with historical contamination data from 1950s weapon tests (accuracy of the prediction)
- Assess model uncertainty for same input data set but different codes:
  - yearly averaged meteorological conditions
  - specific, most relevant meteorological conditions (precision of the prediction)





WP4 – Protective actions strategies (BfS):

- Develop harmonized protective action strategies, based on the unified source terms of WP1 and specific endpoints of the uncertainty analysis in WP3
- Develop effective ways of communicating protective measures to the public, taking into account psychological, social and ethical consideration and utilizing results of a workshop with key players in emergency response

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Advice for the Public on Protection in Case of a Nuclear Detonation



Project structure

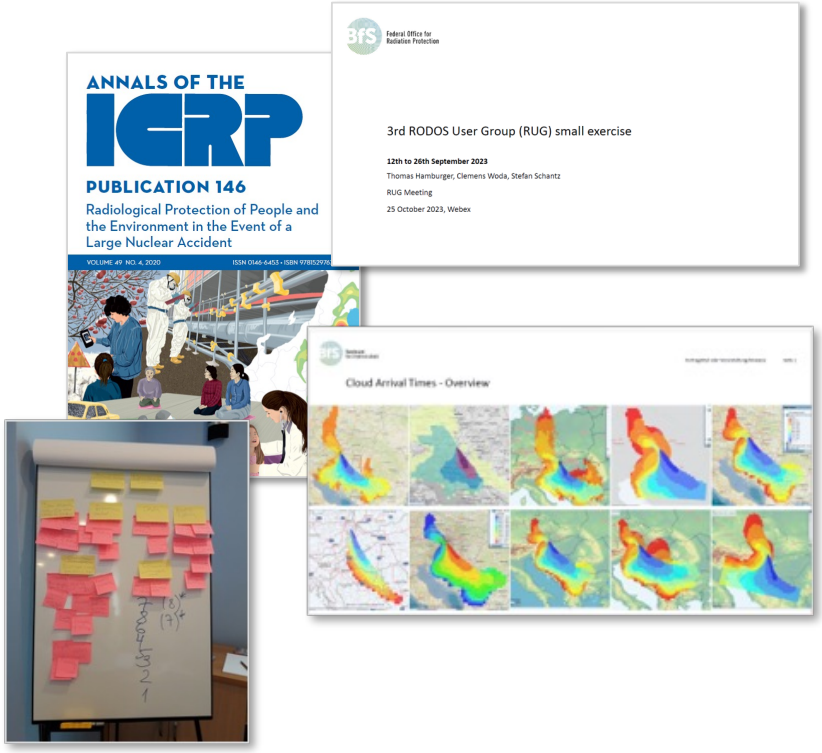
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WP 5 – Education, training and dissemination (NMBU) :

Disseminate project results to the European operational emergency preparedness and response community and worldwide using:

- European Radiation Protection Platforms organised in MEENAS
- International bodies such as IAEA, OECD NEA, HERCA-WENRA
- Regular international exercises of the RODOS and ARGOS user groups
- International conferences
- Training courses targeted at the next generation of radiation protection specialists, PhD students and early career scientists
- WP 6 – Project management



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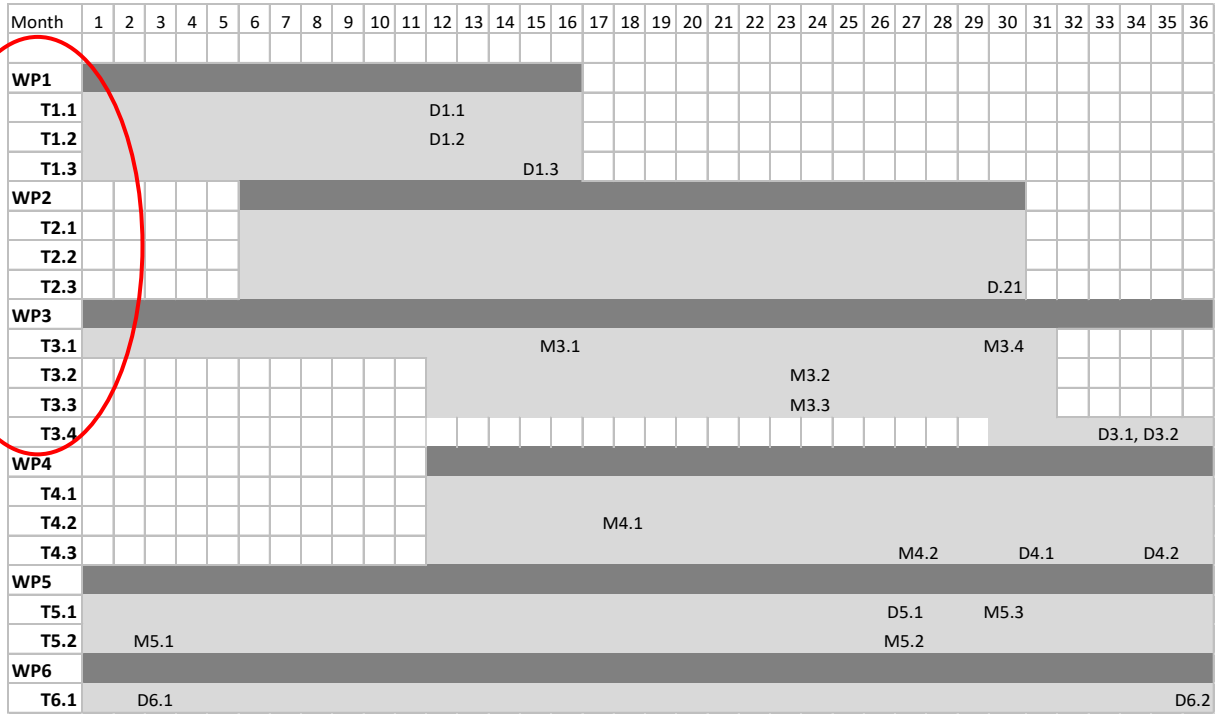
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Timing of the different WPs

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Today



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Project Results & Impact

- Updated simulation models, which will be state-of-the-art at the end of the project
- Recommendations for protective actions & strategies to disseminate them to the population, based on the updated models
- Implementation in national and supra-national DSS (e.g. ARGOS, JRODOS, JAM-IntND (UK), SNAP (Norway))
- Harmonized models potentially lead to a harmonized cross-border transnational emergency response
- Recommendations for future research for further improvement in modelling and dose assessment

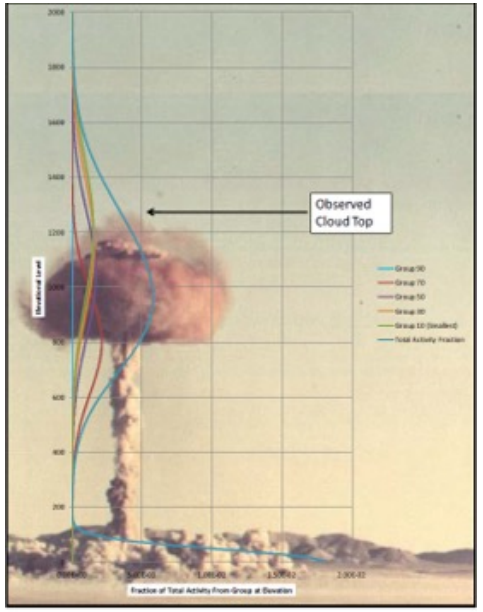


Image: O'Day, Buckley E. III , 2009

https://scholar.afit.edu/etd/2454

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