PREDICT WP3: model comparison

PREDICT WP 3 overview

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Rome, 11.11.2024

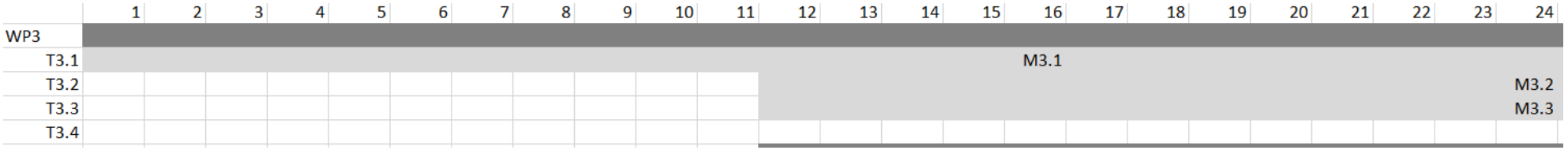
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Objectives of the WP3

- Work Package 3 aims at quantifying model uncertainties resulting on the one hand from current limited understanding of key model parameters and on the other hand by exploring the consequences of critical weather conditions on the model results such as high precipitation events and weather conditions with changing wind directions and frontal passages
- The WP consists of 4 tasks and Sarah will present the status of the first task on model intercomparison

Tasks of WP3

- Model comparison and validation using historic events
- Sensitivity analysis of key model parameters
- Sensitivity analysis for key weather conditions
- Recommendations from the exercises

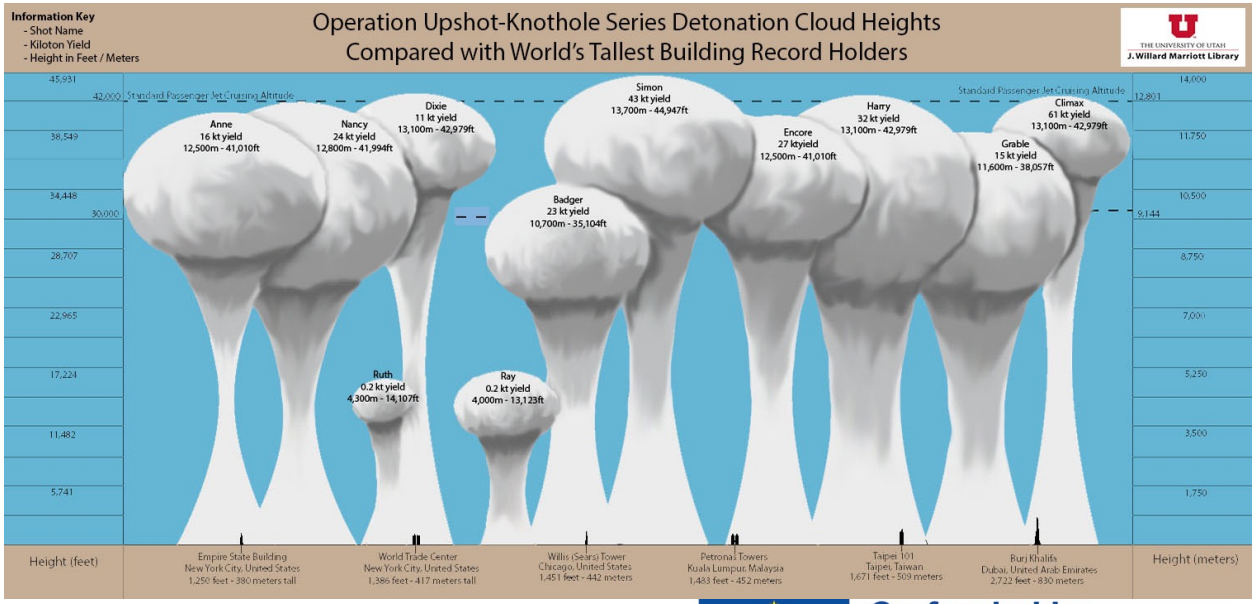


Task 3.1: model comparison and validation

- Comparison with historic data has limitations
  - Historic weather data may not have the quality as well as time and spatial resolution as current numerical data
  - Dose rate measurements – the typical data that has been collected at that time – were monitored at different locations and times
  - Typically, data were adjusted to 12 hours after the release
  - Arrival time were also adjusted to hourly values
- Nevertheless, we expect insight into model performance
- Tests will be repeated with updated models (parameters)

Task 3.2: Sensitivity analysis of key model parameters

- Perform statistical analysis to identify key sensitive model parameters based on recommendations from WP1 and WP2, e.g.
  - Plume dimensions
  - Activity versus height



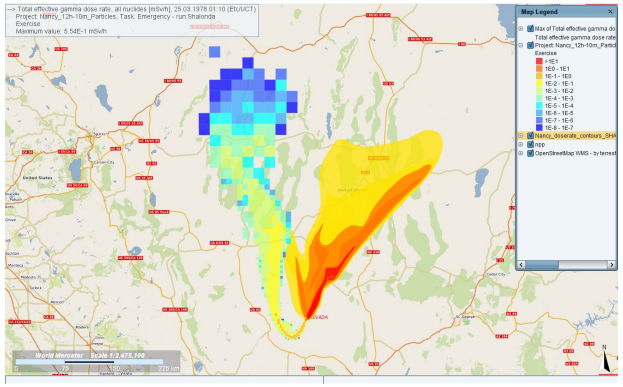
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Task 3.2: Sensitivity analysis of key model parameters

- Perform statistical analysis to identify key sensitive model parameters based on recommendations from WP1 and WP2, e.g.
  - Plume dimensions
  - Activity versus height
  - Particle size distribution
  - Shape of particles
- Methodology has to be defined
- Limitation of resources for full probabilistic analysis?

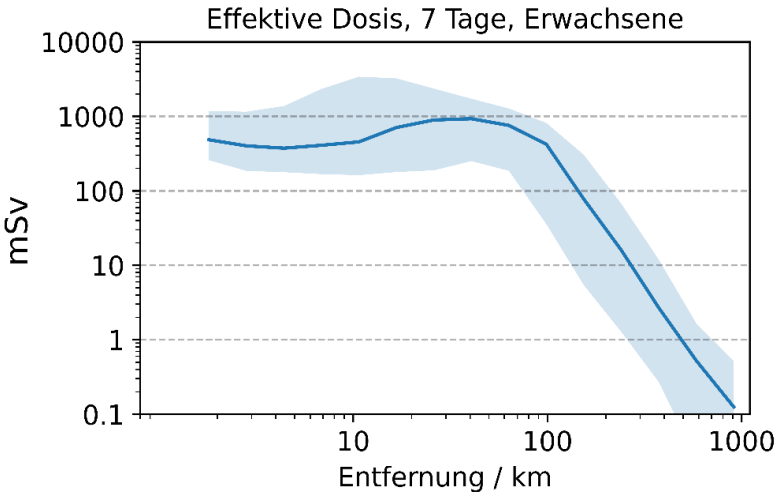


Nancy: JRODOS with smaller particle size

Task 3.3: Sensitivity analysis for key weather conditions

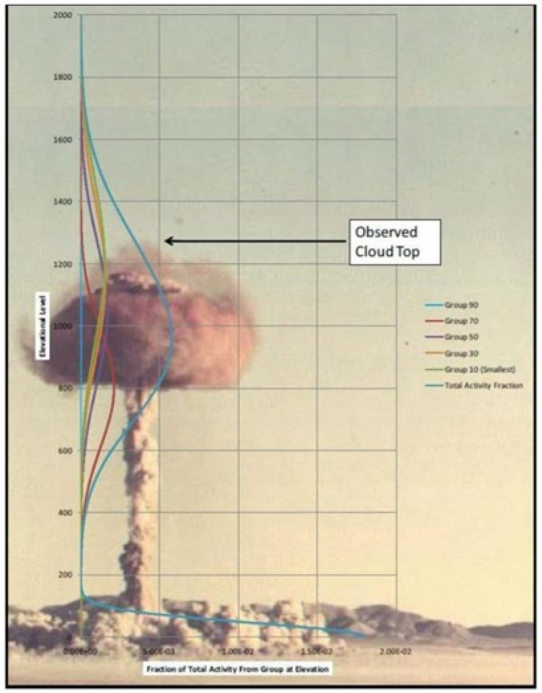
- This task will explore the sensitivity and uncertainty of model results related to variable weather conditions
  - simple or complex weather,
  - changing wind directions,
  - situations with or without precipitation

Example: 10 kT Explosion: BfS with LASAT and 365 weather scenarios shows possible variability of results



Task 3.4: Recommendations from the exercises

- Based on the findings from Tasks 1-3, a report will be developed that provides recommendations for model parameter settings dependent on the prevailing conditions.
- Further a default set is provided in case of knowledge is limited
- Results will be open to all, also outside the project



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Conclusions

- The consortium is aware that current simulation models need improvements
- Due to limitation in budget, the project will mainly improve model parameters
- With our tests and validation exercises we aim to improve national and supra-national DSS (e.g. ARGOS, JRODOS, JAM-IntND (UK))
- Results will provide a database for all interested modellers