B.Prepared: EMERGENCY PLANNING AND DECISION SUPPORT SYSTEM IN AUSTRIA FOR MANAGING ACCIDENTS INVOLVING HAZARDOUS SUBSTANCES

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B.PREPARED – Project overview

- **Goal:** Development of an Emergency planning and decision support system for managing accidents involving hazardous substances and toxic materials.
  - **Duration**: 2 years (2022 – 2023)

- Methodology:
  - Workshops in Linz, Graz und Vienna
  - Collecting system requirements
  - Acceptance incl. gender considerations
- User friendly software design and development

- **Results:**
  - Service portal demonstrator + content
  - Interfaces and examples of typical services
  - Integration into an existing staff command and major incident management system

Funded by:

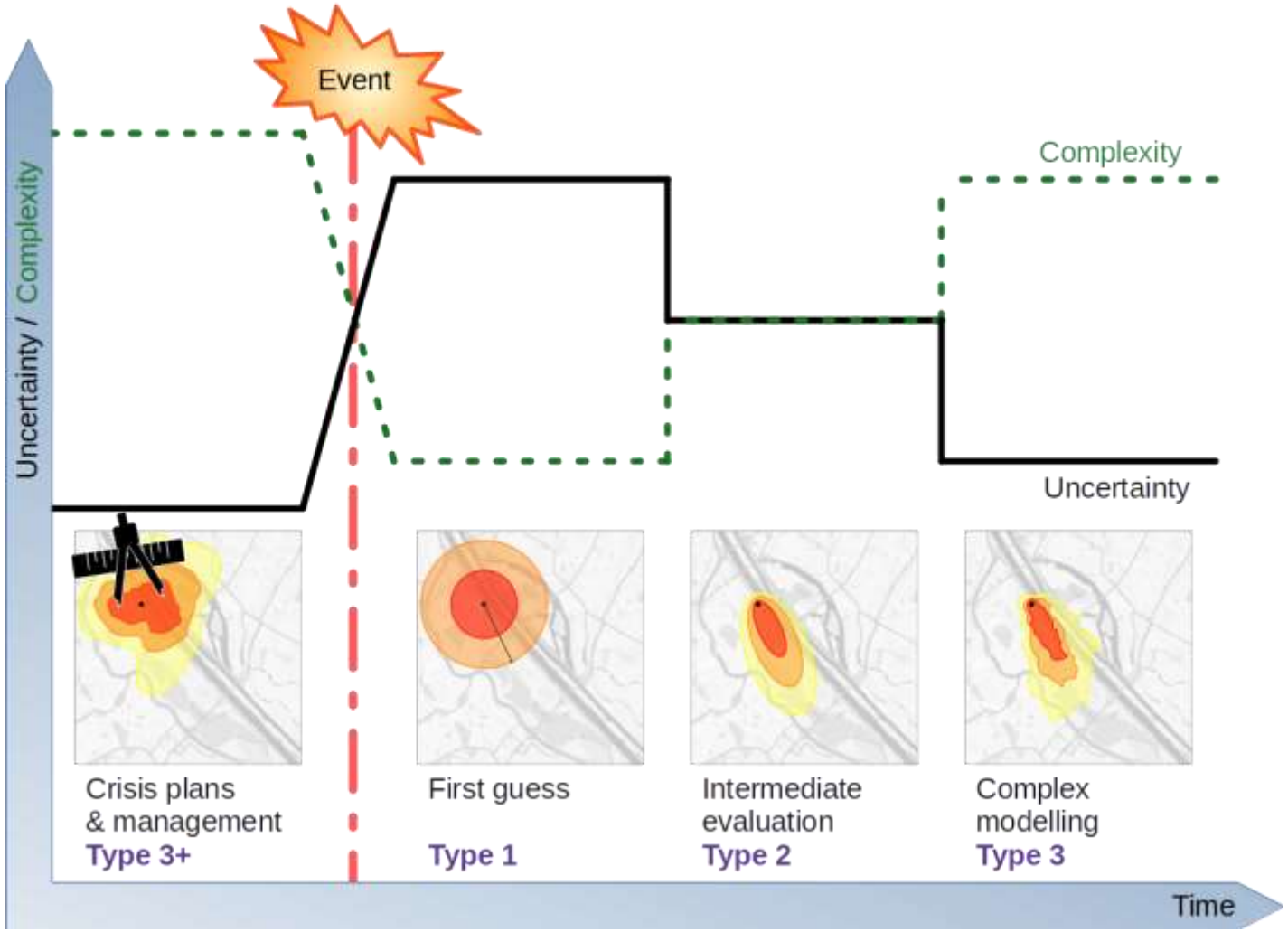
Dispersion modelling

States of complexity:

Type 1 First guess estimation
+ fast & robust
+ little input needed
– high uncertainty

Type 2 Intermediate evaluation
+ consideration of current and local factors
~ interm. uncertainty
~ interm. computation time

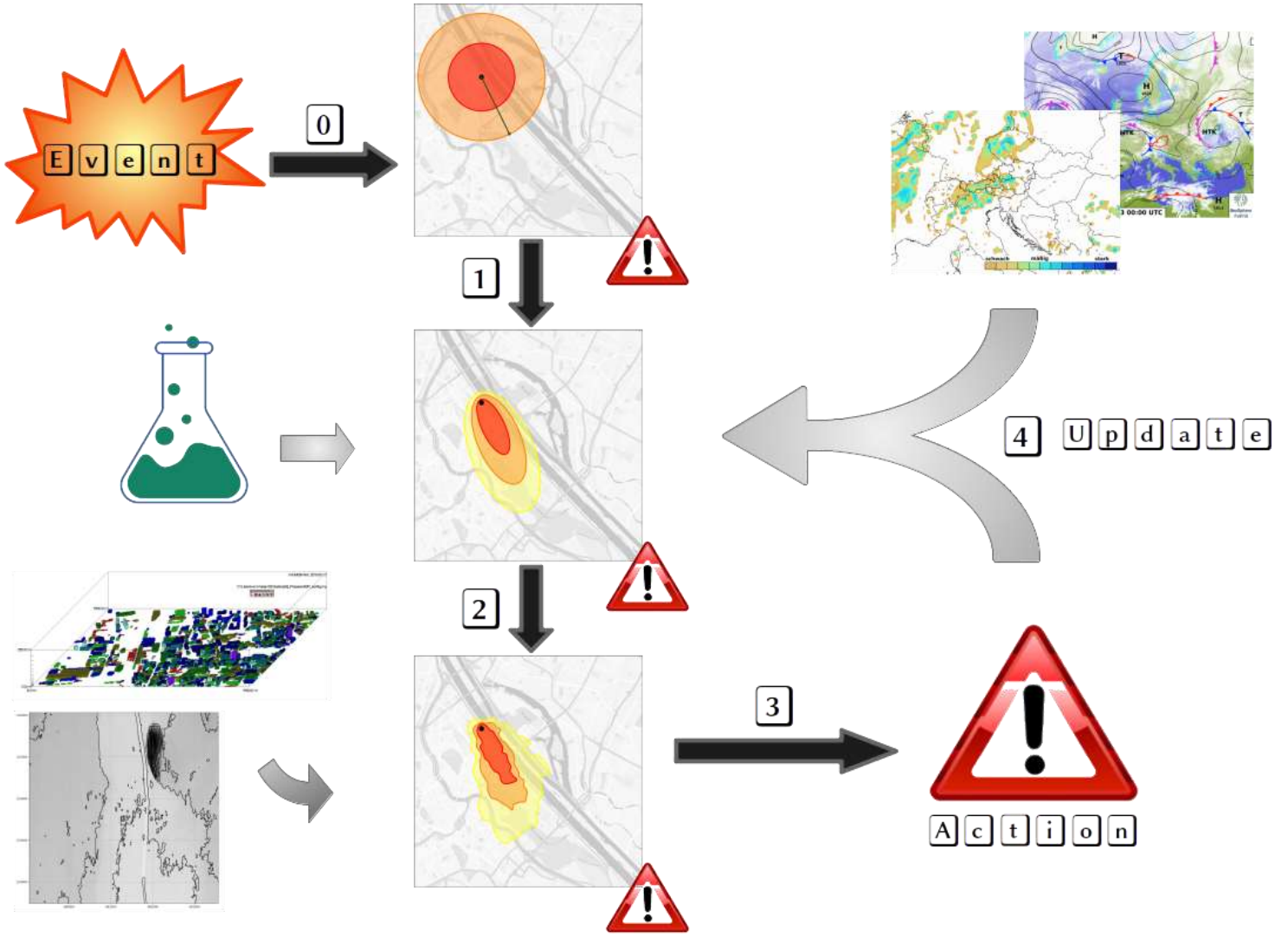
Type 3 Complex Modelling
+ temporal & spatial variation of wind fields, forecasts, terrain, buildings
+ low uncertainty
– high computation time



Action Chain

General Concept:

- **Event / Alert**
- **Definition of Threat-Area (first estimations)**
- **Fast response model with current information of substance and meteorology**
- **Complex model with forecasts, terrain and buildings**
- **Update for new information on**
  - **Source**
  - **Meteorology**
  - **State of site**



Concept of a Portal-Solution

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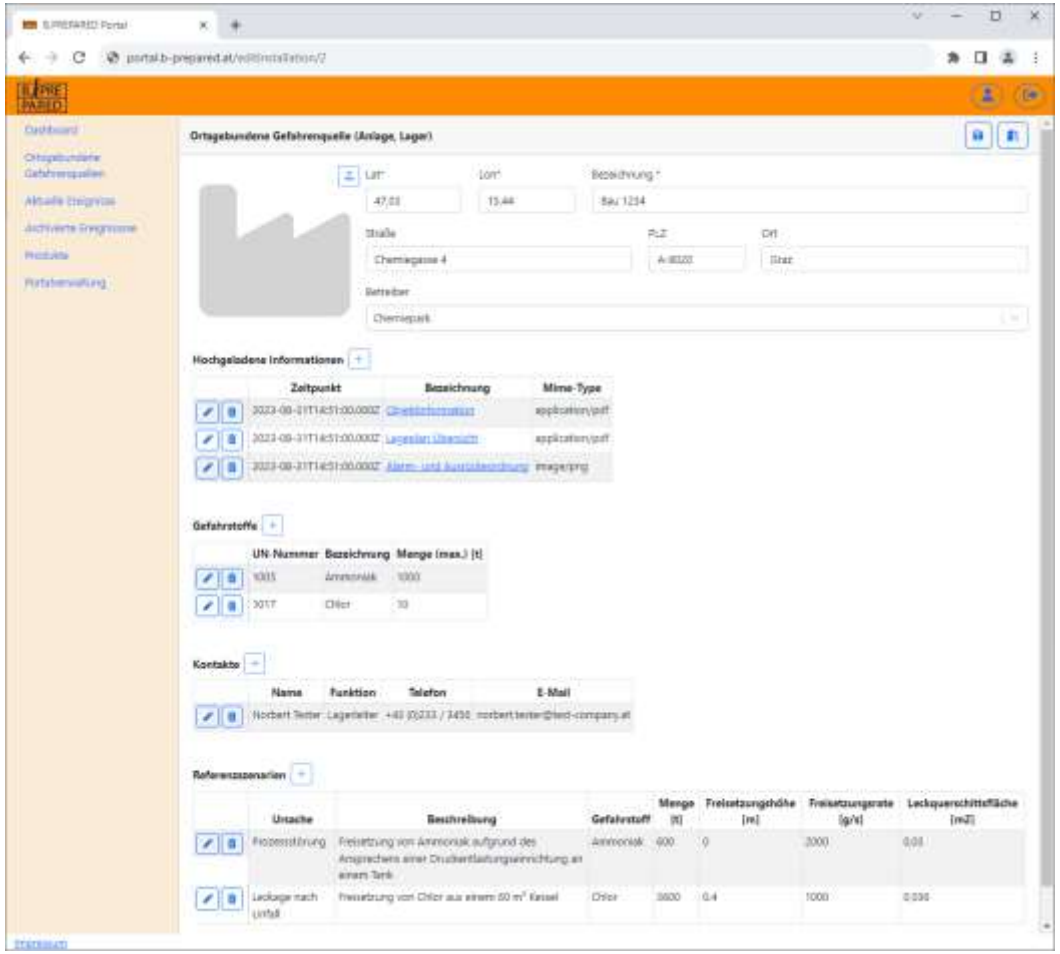
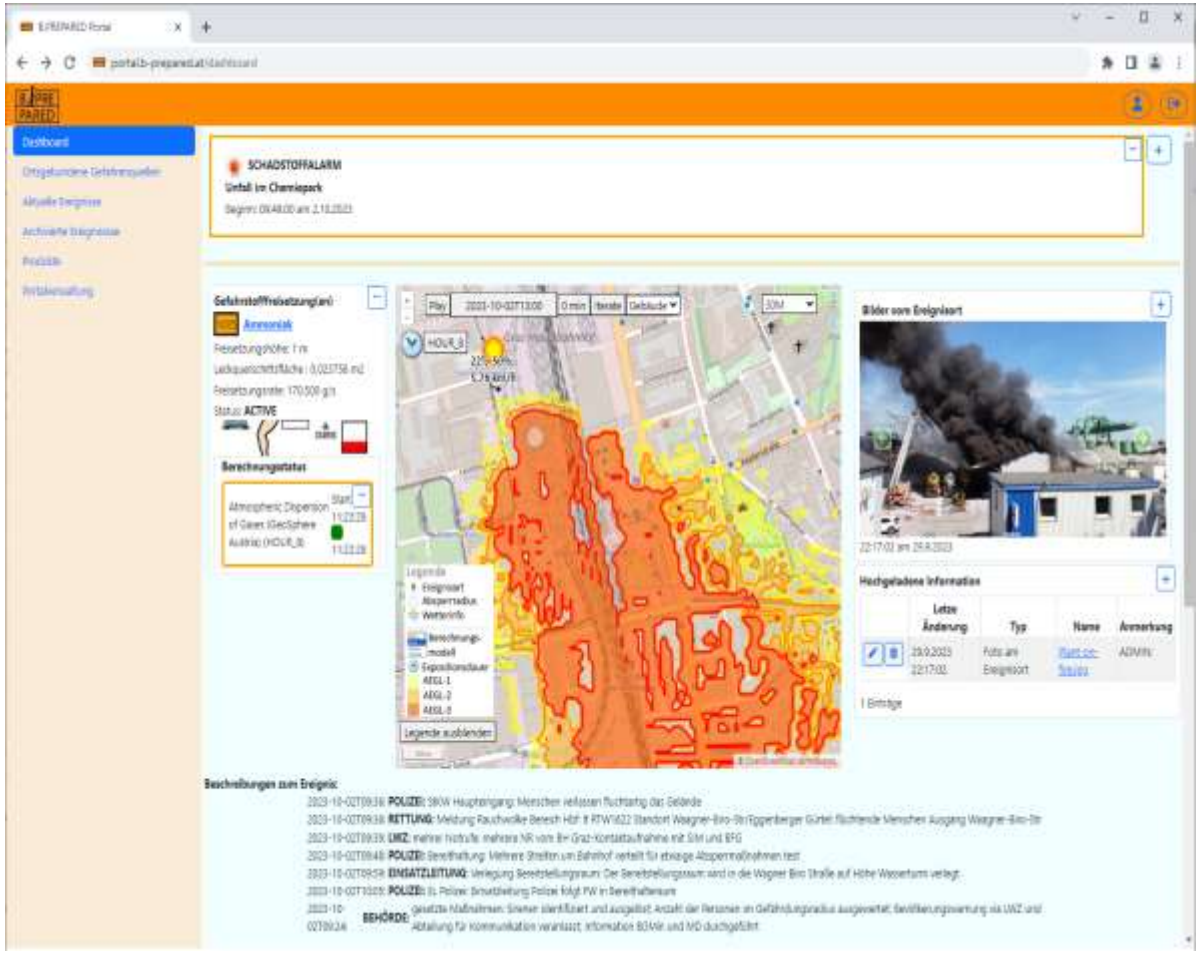
B.PRE PARED

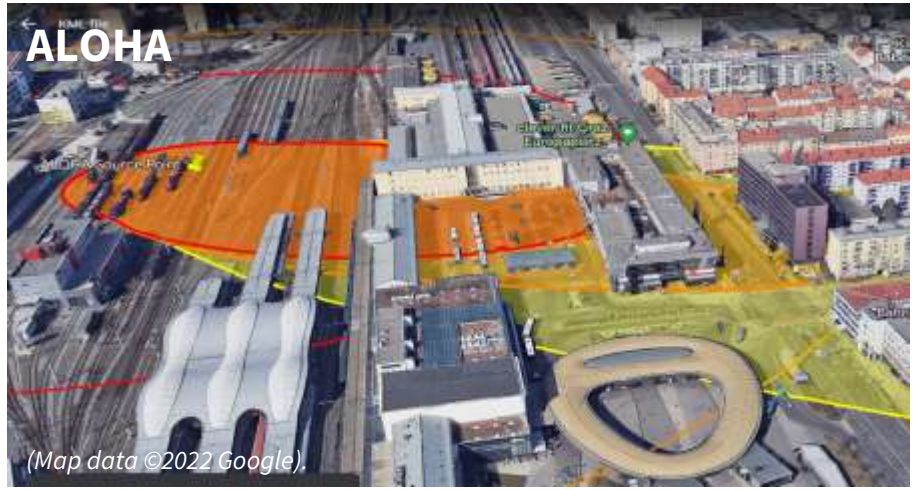
Serviceportal

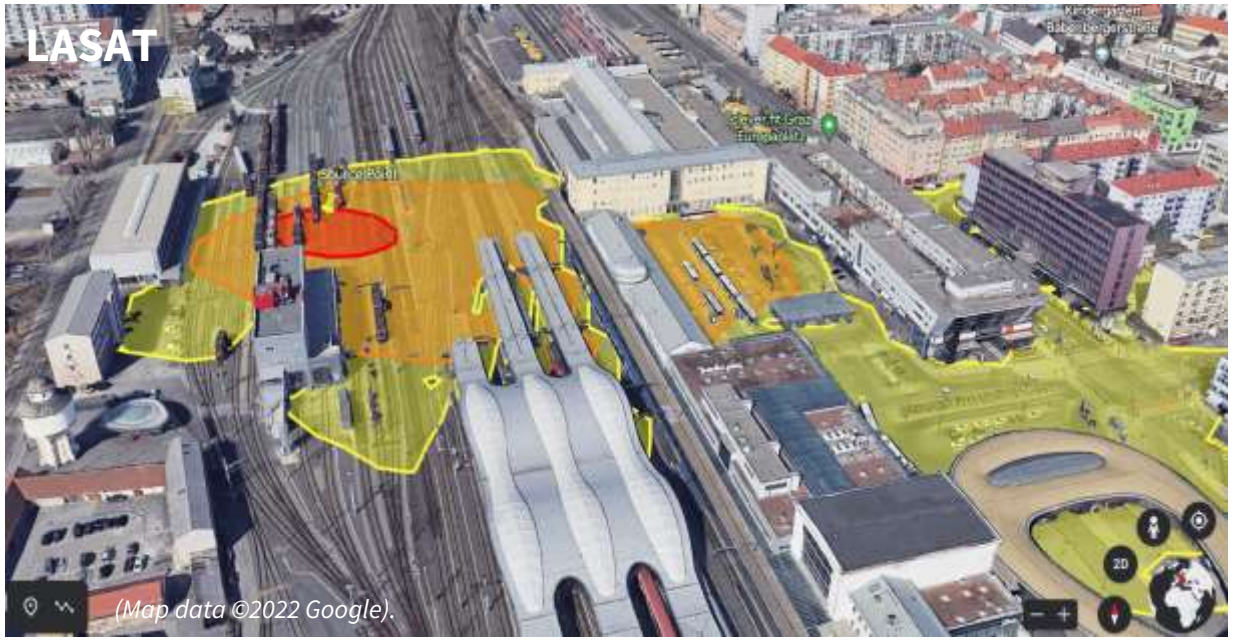




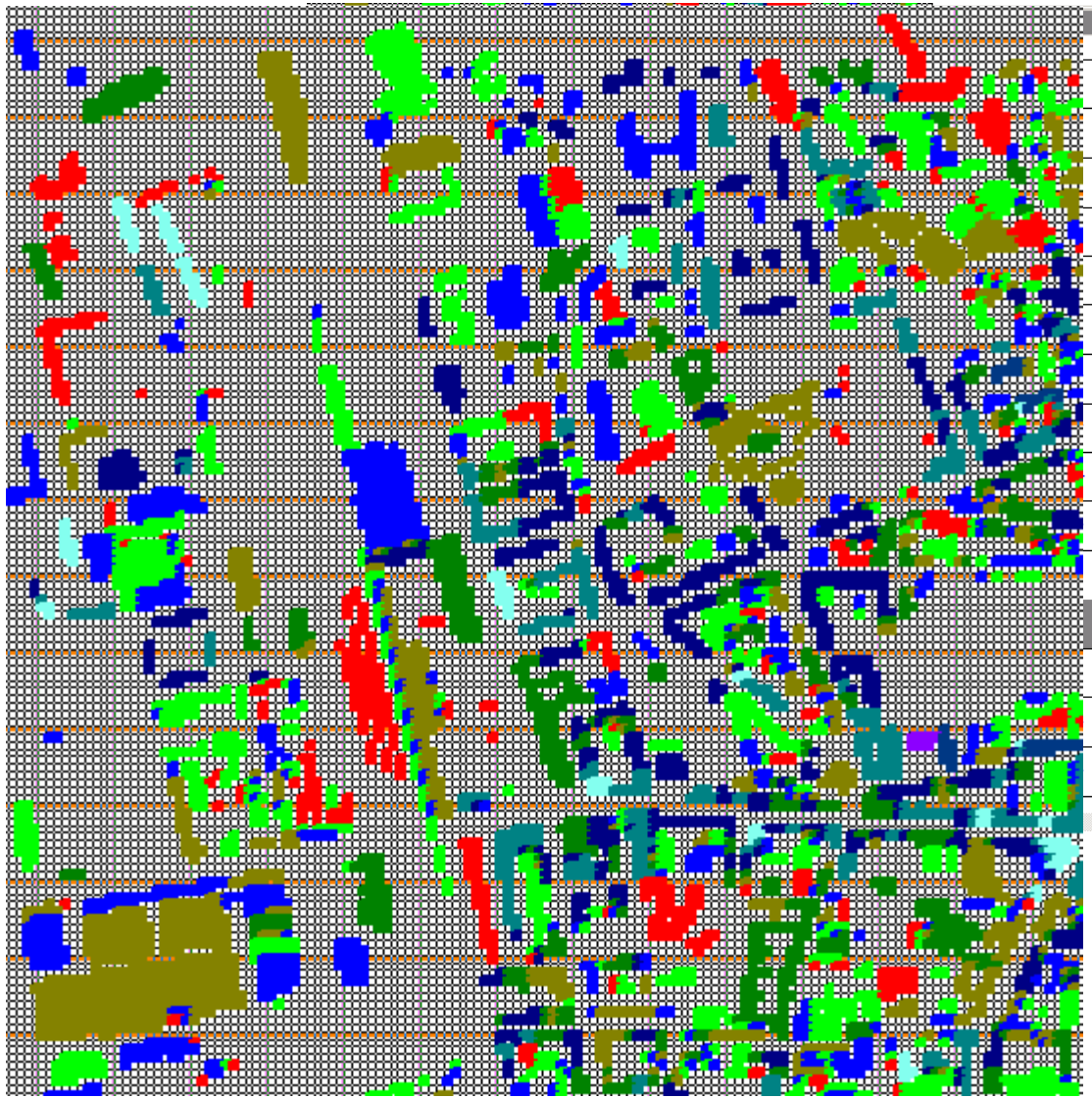
Working Package 3 – Modells and modell runs

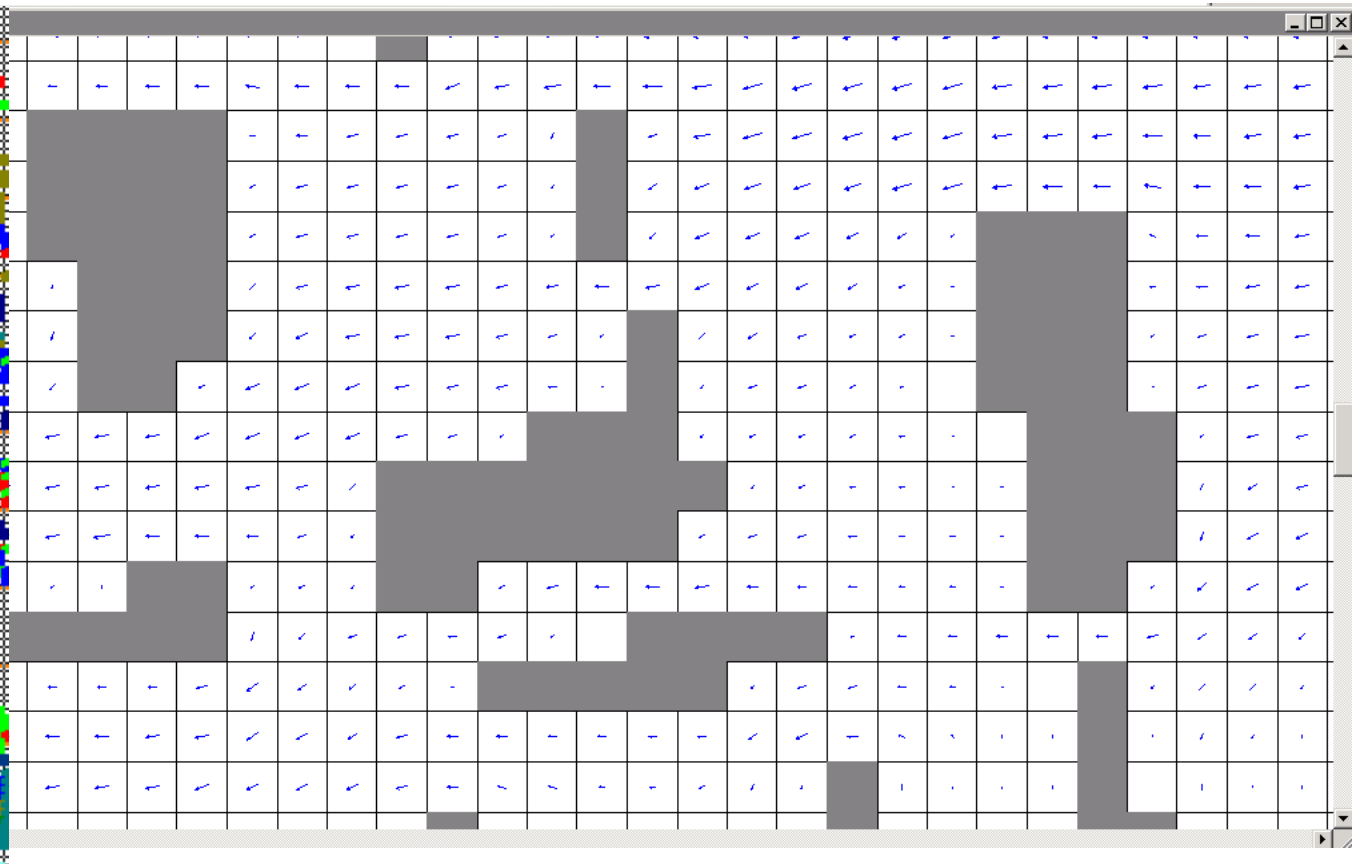
- 2 Scenarios:
  - Central railway station Graz
  - Chemipark Linz (Seveso Establishment)
- 2 dispersion modells:
  ALOHA, LASAT
- Windfieldmodell: MISKAM
- Meteorological input from INCA to LASAT
- 3 levels of complexity:
  - flat
  - terrain
  - terrain+ buildings
- Modell start via B.PREPARED portal
- Results displayed in B.PREPARED portal
- Results displayed in Hexagon system





MISKAM Wind Vectors





Scenario 1: Graz central railway station

- First Response
  Gaussian Model
- **Minimum information** given (Location, Substance and Wind)
- Rough estimation of the possible Thread-Zones
- 1 hour forecast

Scenario 1: Graz central railway station

- Fast Response Lagrangian Model
- Detailed meteorological information
- No Terrain and/or Buildings
- 1 hour forecast

Scenario 1: Graz central railway station

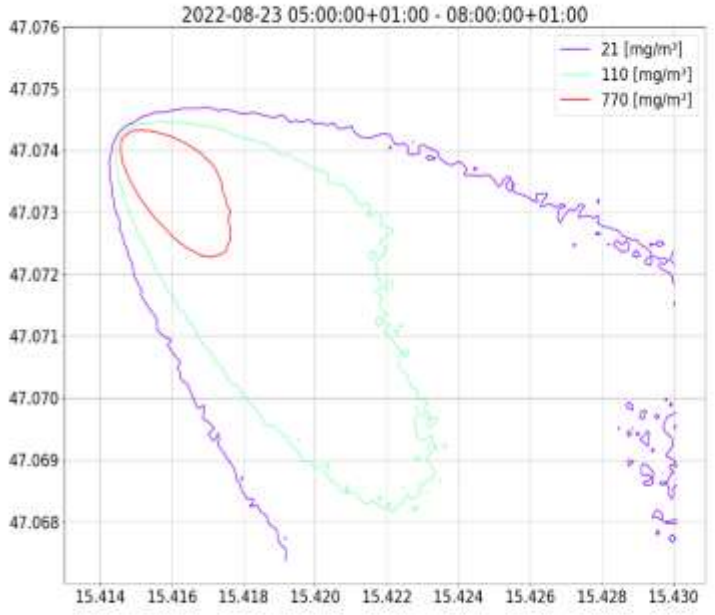
- **Intermediate Response: Lagrangian Model**
- **Orography (Terrain)**
- **No Buildings**
- **1 hour forecast**

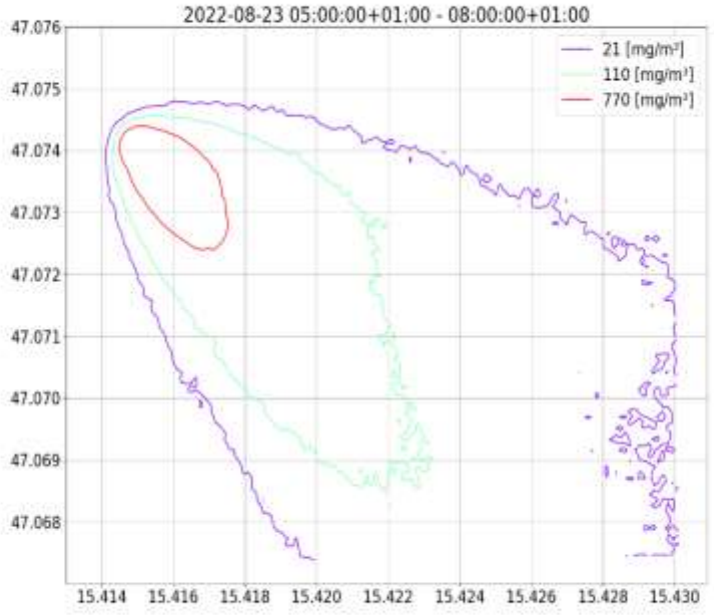
Scenario 1: Graz central railway station

- Detailed Response Lagrangian Model
- Complex Wind Fields
- Terrain and Buildings
- 1 hour forecast

Progressive forecast modelling

- „Evolution“ of Thread-Zones within one iteration
- Increasing complexity VS decreasing uncertainty
- 3 hour forecast (accumulated)





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Scenario 2: Chemical Factory Linz / Seveso establishment

LASAT thread zone for flat terrain / no obstacles, ammonia toxical substance . *(Map data ©2022 Google).*

ALOHA Results

LASAT thread zone with terrain / no obstacles, ammonia. ***(Map data ©2022 Google).***

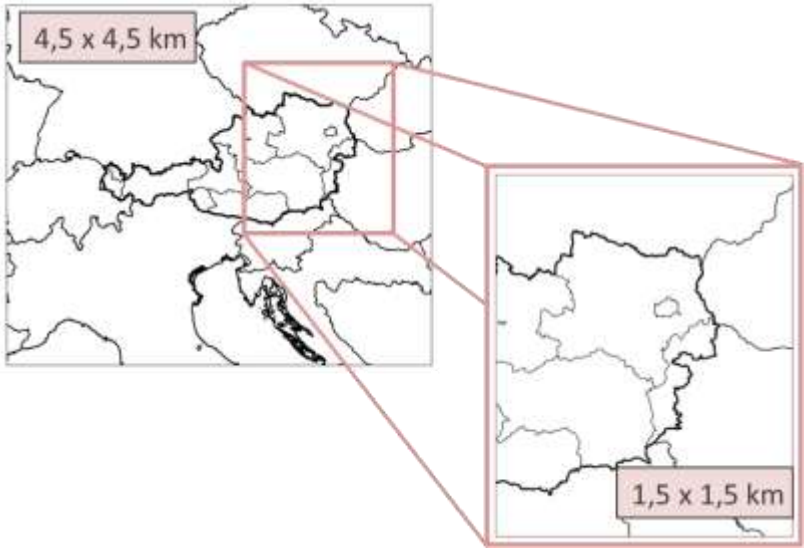
LASAT thread zone with terrain and buildings, ammonia. ***(Map data ©2022 Google).***

ENVINER-local – Example of a modell service

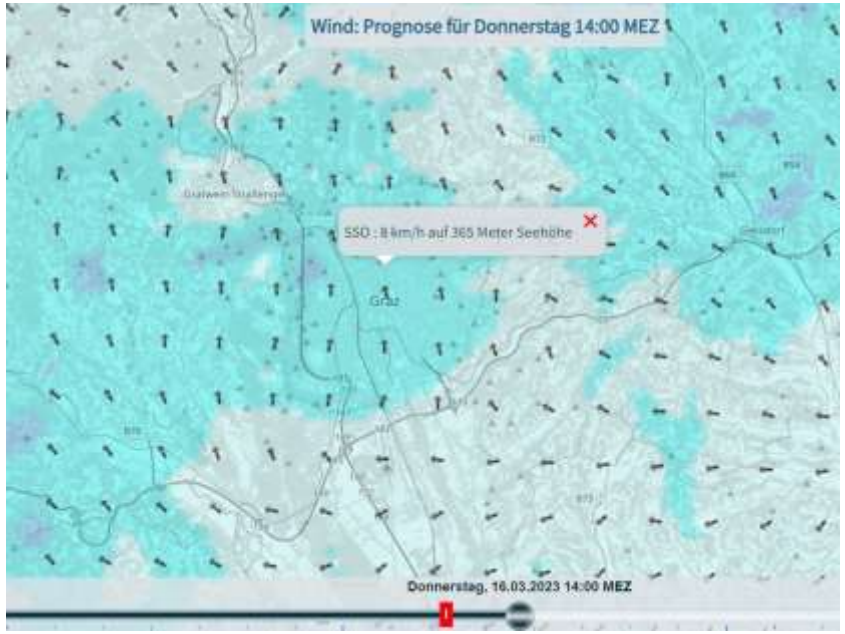
- **Dispersion modelling**
  - Lagrange-particle modell LASAT

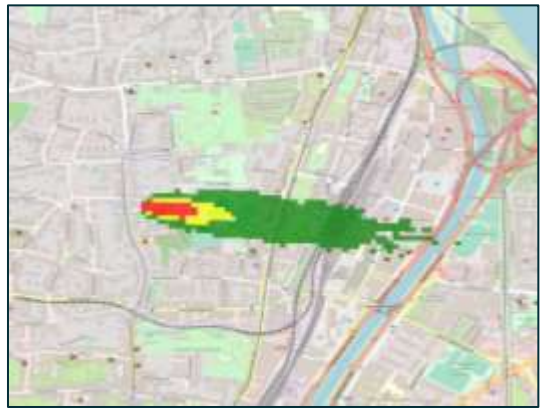
Based on meteorological input data
- INCA Δx=1km, Δt=10min + Windmodell (diagnostic, MISKAM)
- WRF-Chem AUT-Forecast Δx=4,5km bzw. 1,5km, Δt=1h

- **Topography(for INCA/LASAT) for Asutria Δx= 10m**
- **List with the SEVESO-Establishments in Austria**
- **Calculation of the concentration– plots / data (e.g. kml)**
  - INCA/LASAT: Δx= 5m–20m
  - WRF-Chem/LASAT: Δx= 50–100 m



Geosphere Austria offers:
- **Dispersion Model chains for various scales and purposes**
- **meteorological, orographic & urban environmental data**
- **Support, expertise & experience**





Thank you very much for your attention!

Questions…?

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