

A Stationary Sites – General Threat

18 

18 nuclear plants / all relevant weather situations / 7 criteria*

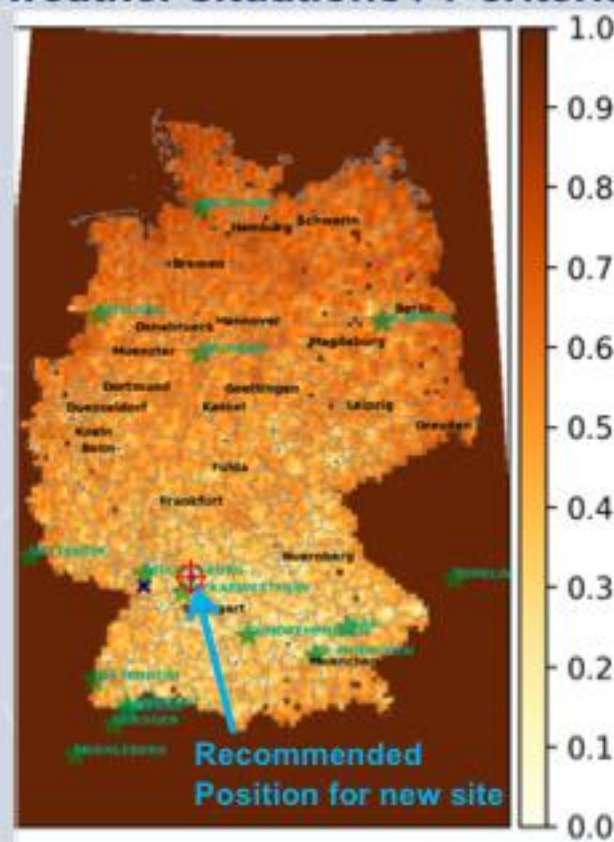
* 7 criteria:

weight

1. Population Density 5
2. Distance to Next Station 5
3. Dose Rate near 100 $\mu\text{Sv/h}$ (critical) 5
4. Time between Alarm and Exposure 5
5. Distance Between Stations 5
6. Distance to Incident Location 2
7. Angular Distance to Nearest Station with resp. to Incident Location 10

★ Nuclear Plant

Iterative Spatial
Optimisation of
New Stationary Sites
(Threat Analysis)



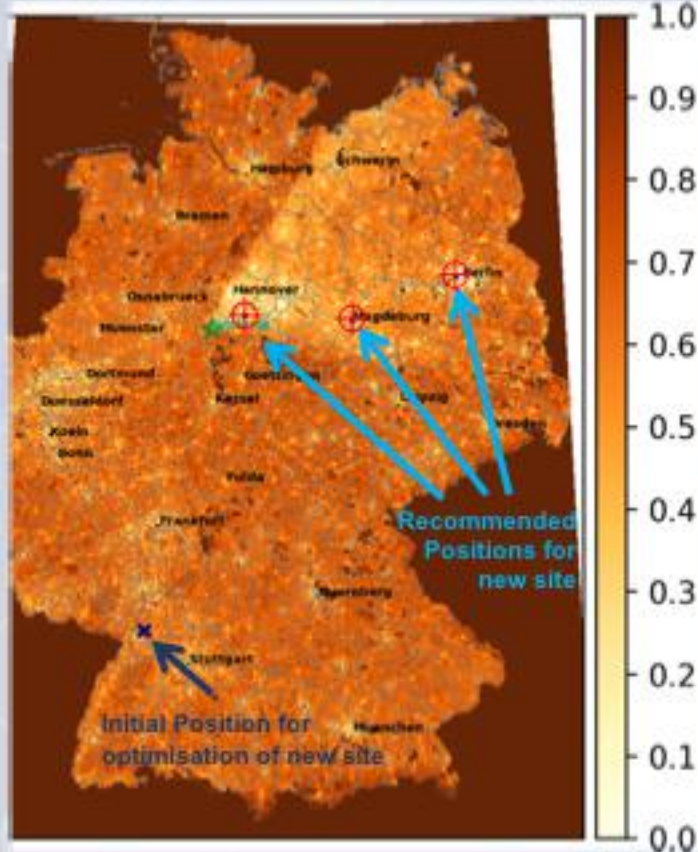
B Stationary Sites – Emergency Pre-Release Phase

1 nuclear plant / Propagation towards NE / 2 criteria*

* 2 criteria:

weight

1. Population Density 2
- 2.
3. ** Dose Rate near 100 $\mu\text{Sv/h}$ (critical) 1

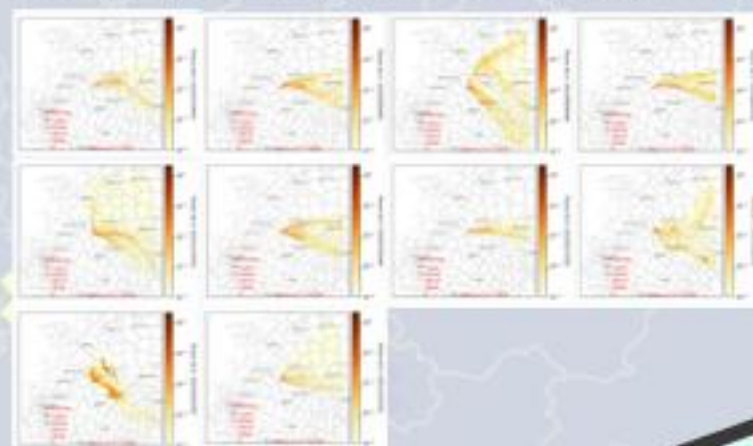


Optimisation Algorithm:
Spatial Simulated Annealing

★ Incident: Nuclear Plant Grohnde

C Mobile Monitoring – Emergency Post-Release / Concept

10 Simulated Models of Radioactive Propagation



Measured Dose Rates



Inverse
modelling

Contamination Chart and
Prohibited Zone

Chart of Dose Uncertainty

$$d_{Kont} = \sum_{i=1}^n w_i^{r\chi^2} w_i^{DEF} d_i$$

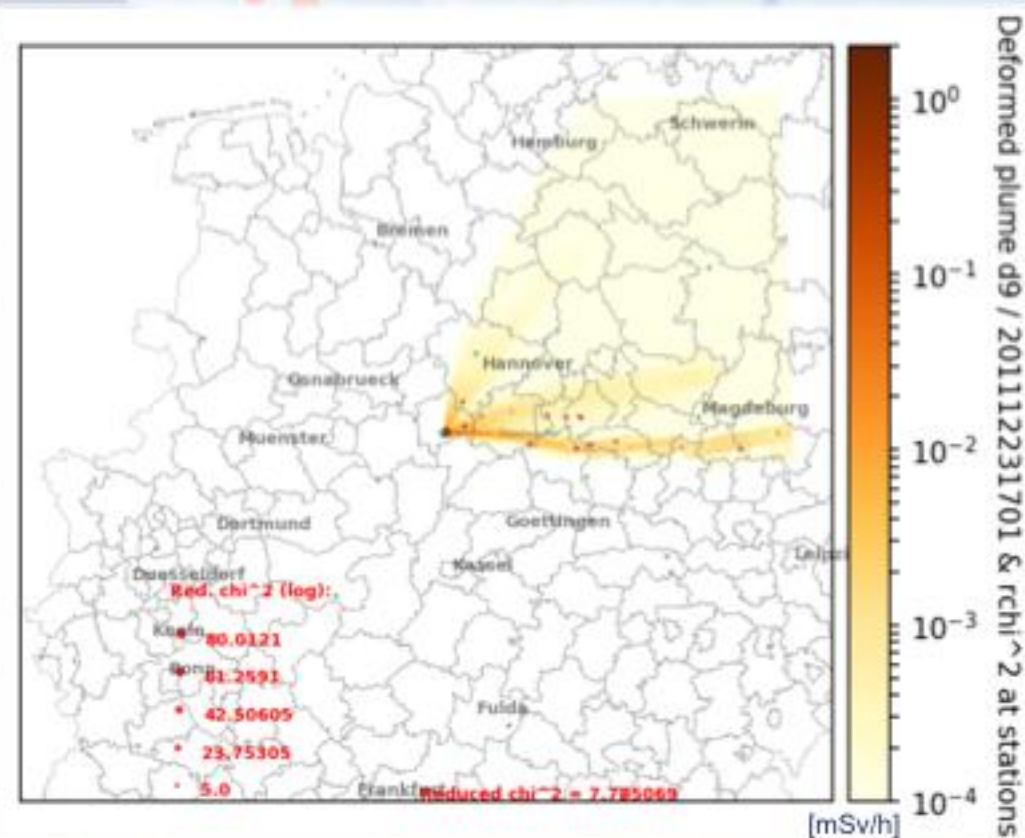
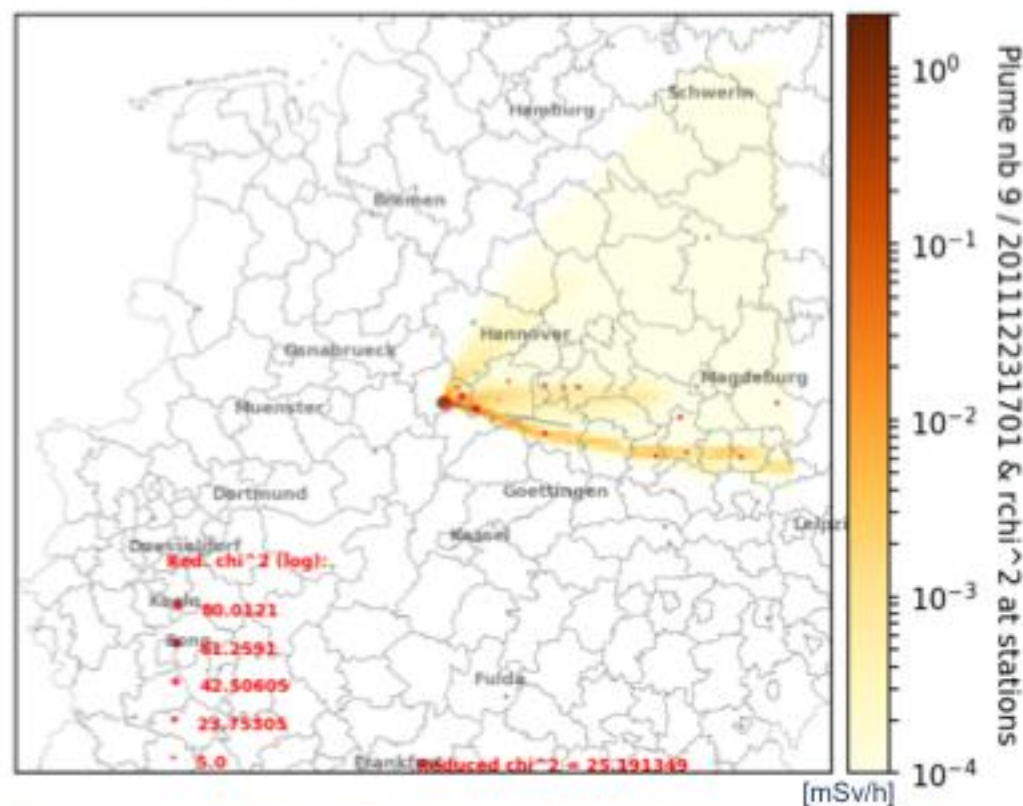
$w_i^{r\chi^2} w_i^{DEF}$: matching probability between
model and measurements

optimise monitoring zones or paths

Spatial Optimisation of Sites
(up to 12 Criteria)

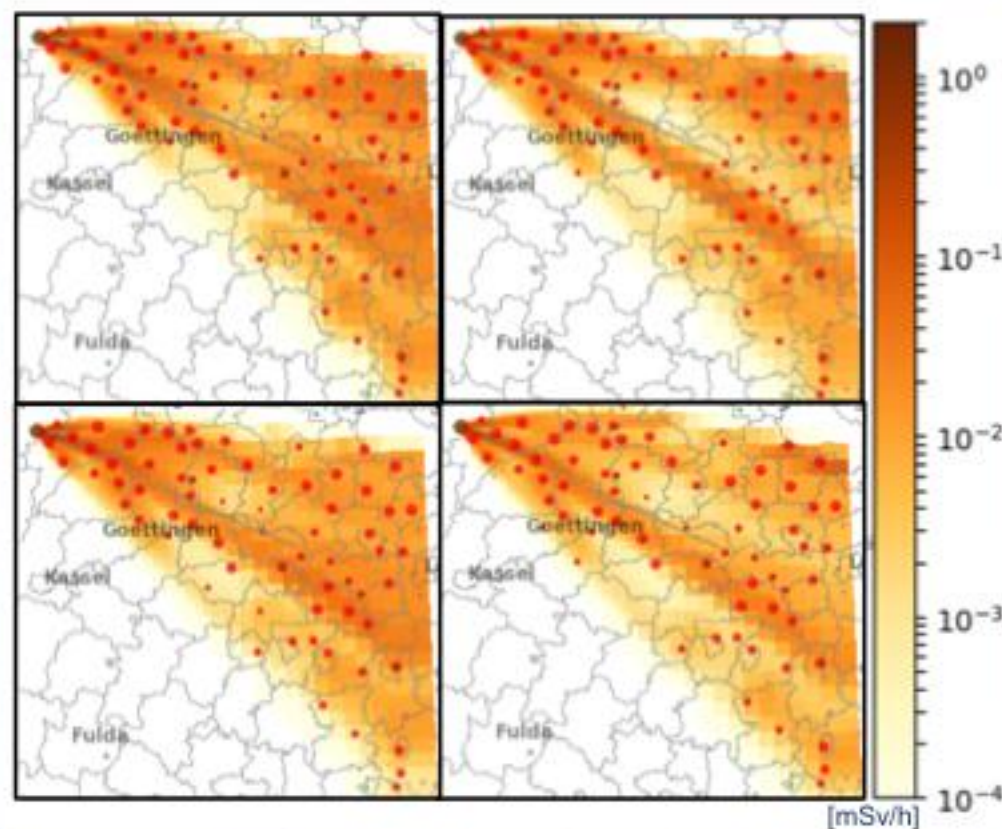
C Mobile Monitoring – Emergency Post-Release / Concept

Model Improvement by slight Deformations:

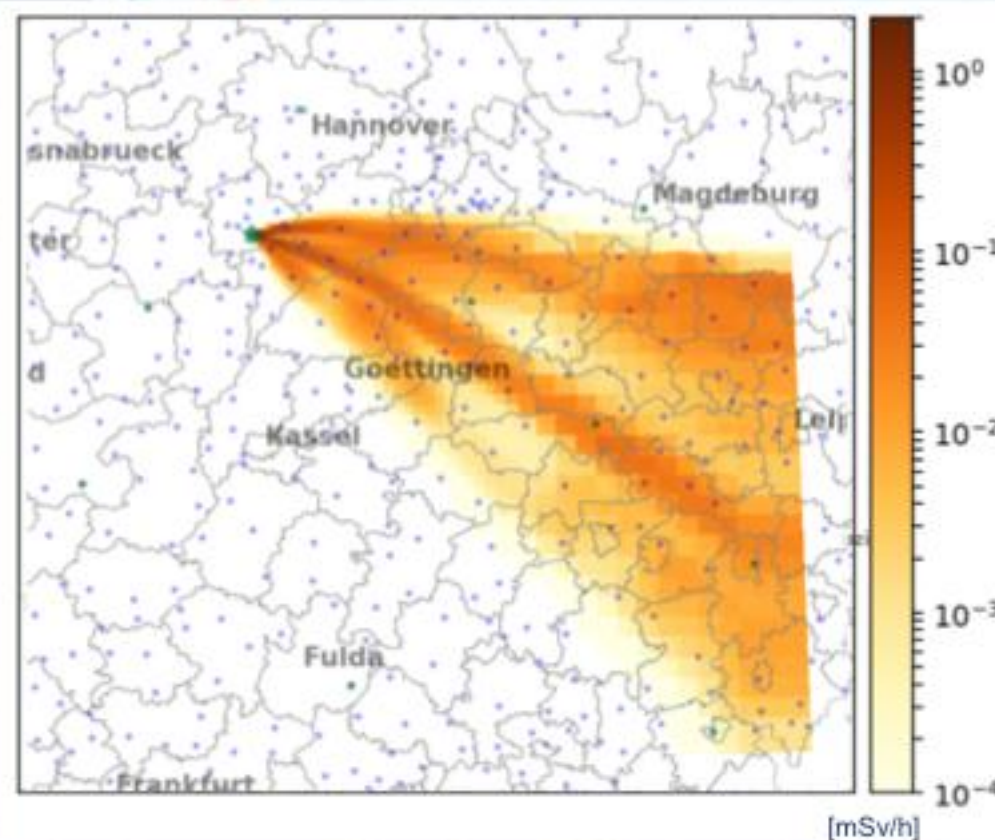


C Mobile Monitoring – Emergency Post-Release / Prop. SE

4 Models & Meas. (red points)

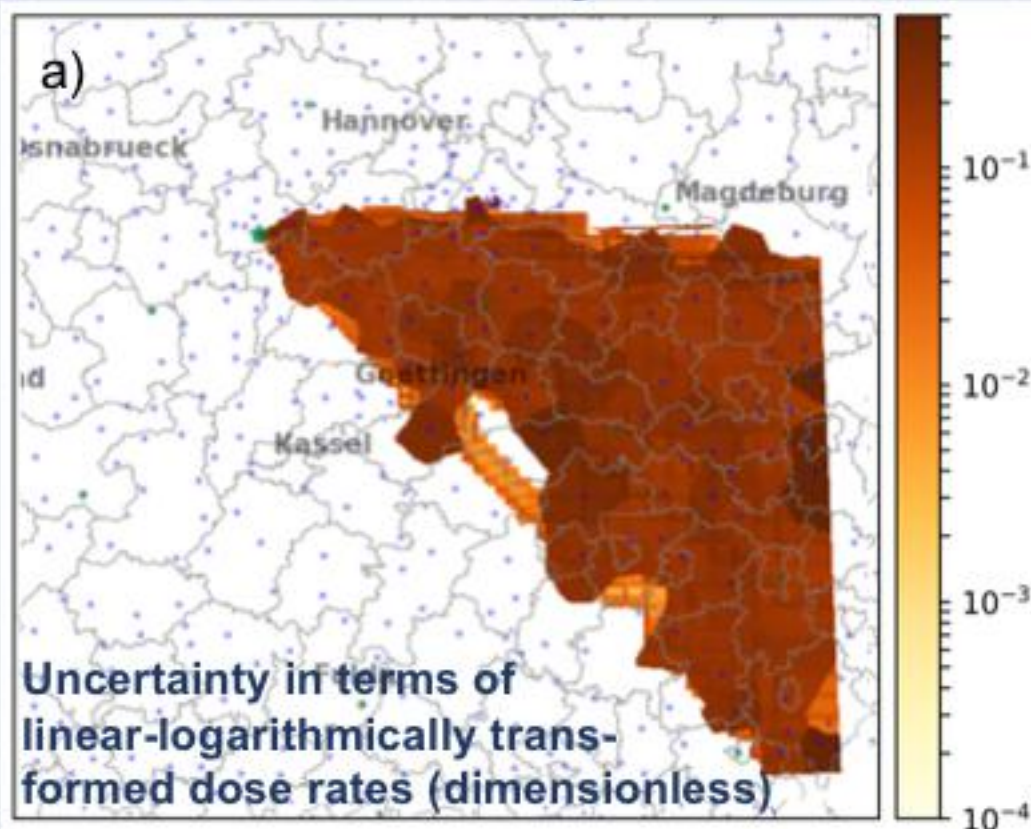


Contamination Chart

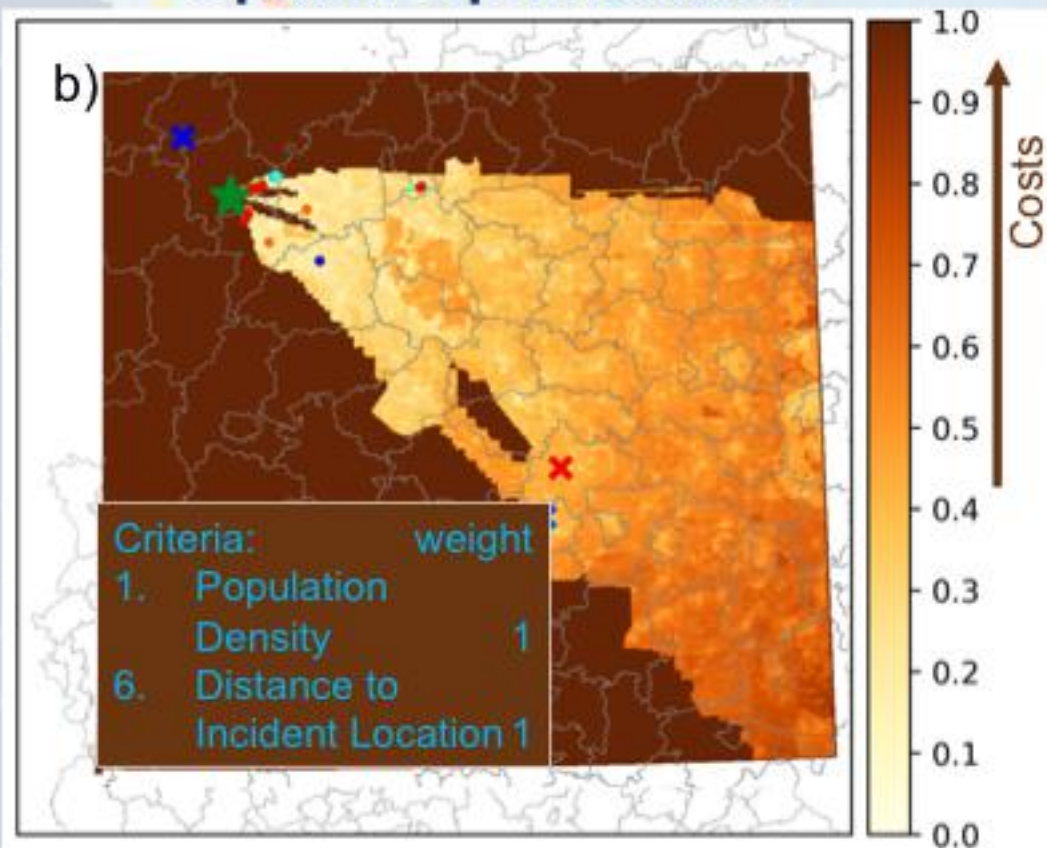


C Mobile Monitoring – Emergency Post-Release / Prop. SE

Uncertainty Chart

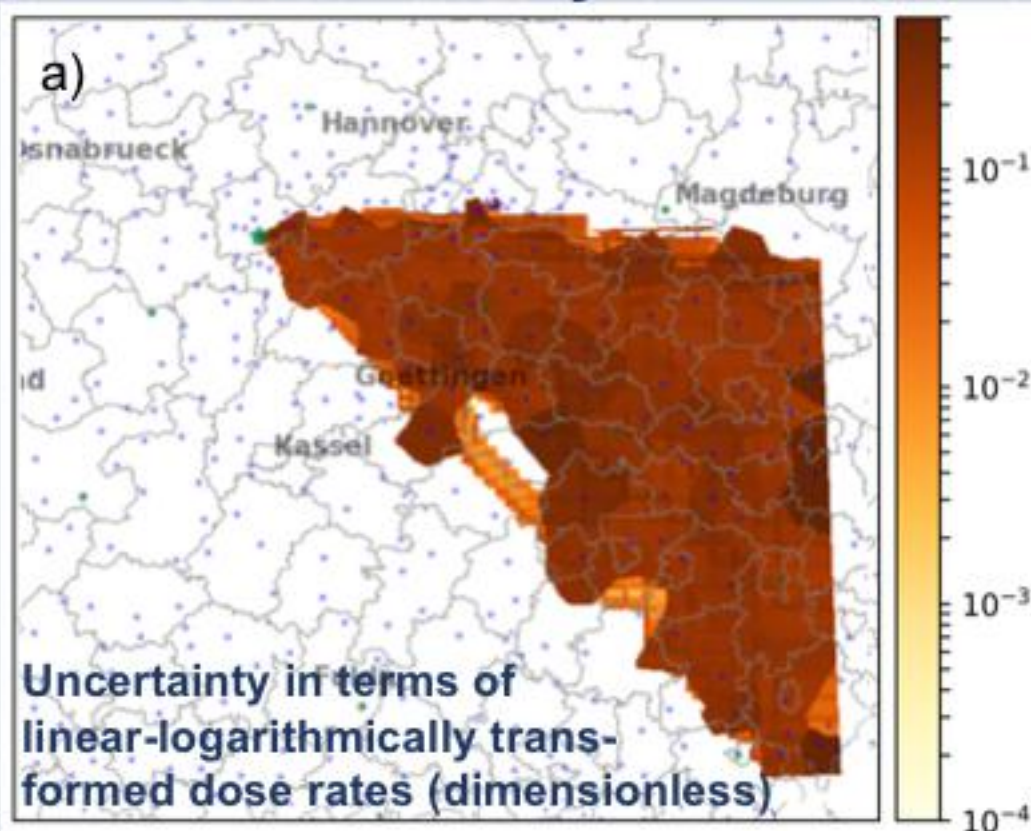


Spatial Optimisation



C Mobile Monitoring – Emergency Post-Release / Prop. SE

Uncertainty Chart



Spatial Optimisation

