

A Stationary Sites – General Threat

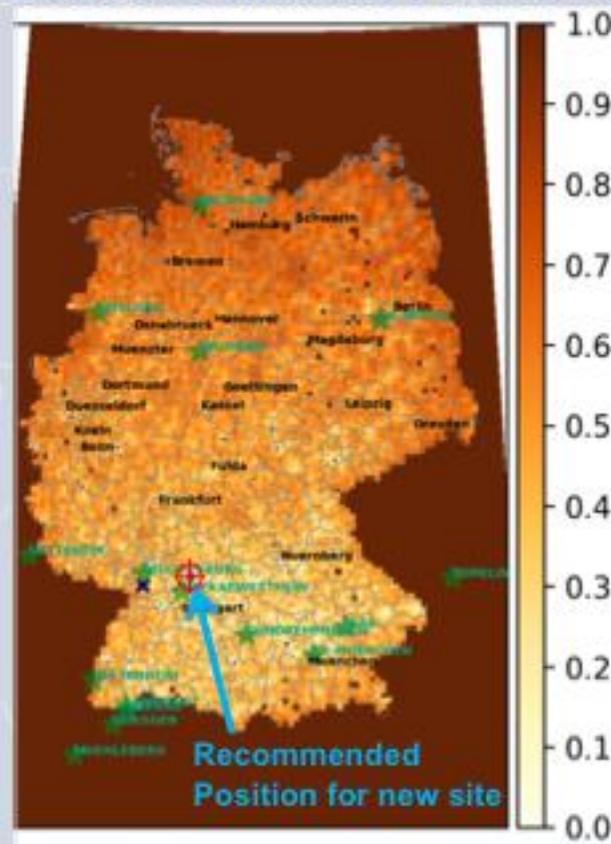
18 

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

* 7 criteria:

weight

Iterative Spatial
Optimisation of
New Stationary Sites
(Threat Analysis)



↑ Costs

- | | |
|--|----|
| 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

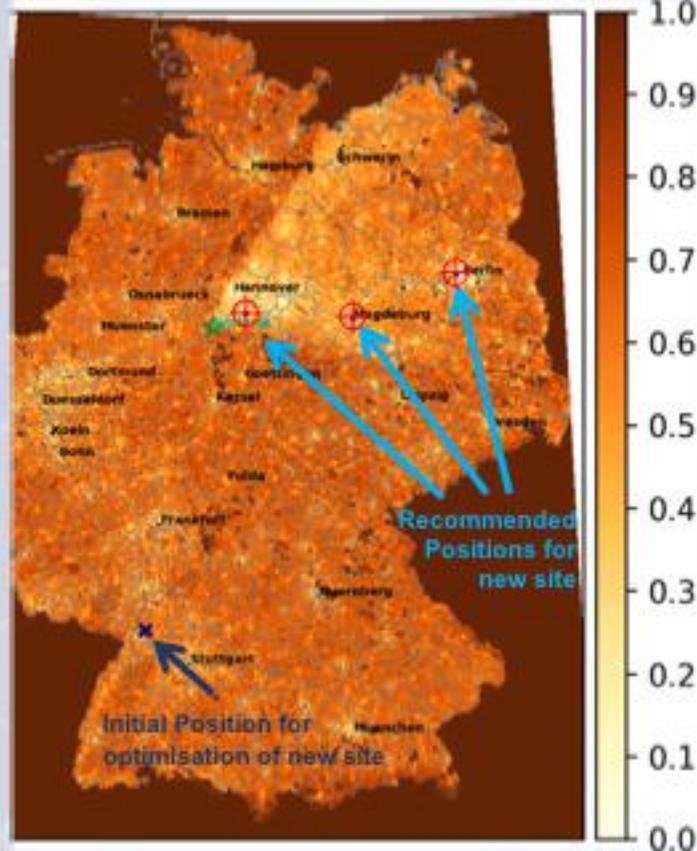
B Stationary Sites – Emergency Pre-Release Phase

1 nuclear plant / Propagation towards NE / 2 criteria*

* 2 criteria:

weight

- | | | |
|----|---|---|
| 1. | Population Density | 2 |
| 2. | | |
| 3. | ** Dose Rate near 100 μ Sv/h (critical) | 1 |

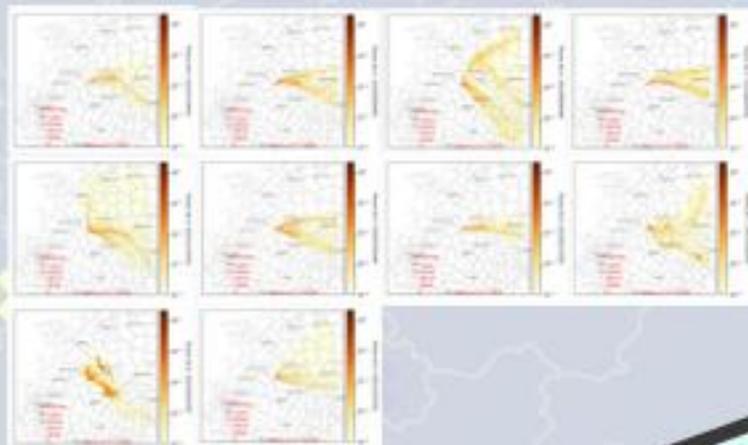


Optimisation Algorithm:
 Spatial Simulated Annealing

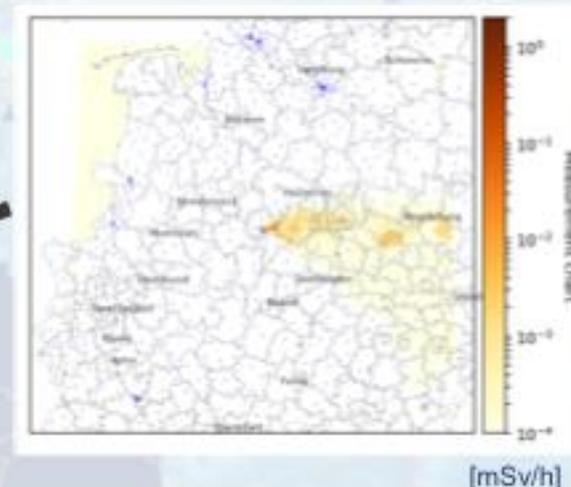
★ Incident: Nuclear Plant Grohnde

C Mobile Monitoring – Emergency Post-Release / Concept

10 Simulated Models of Radioactive Propagation



Measured Dose Rates



Inverse modelling

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

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

Contamination Chart and Prohibited Zone

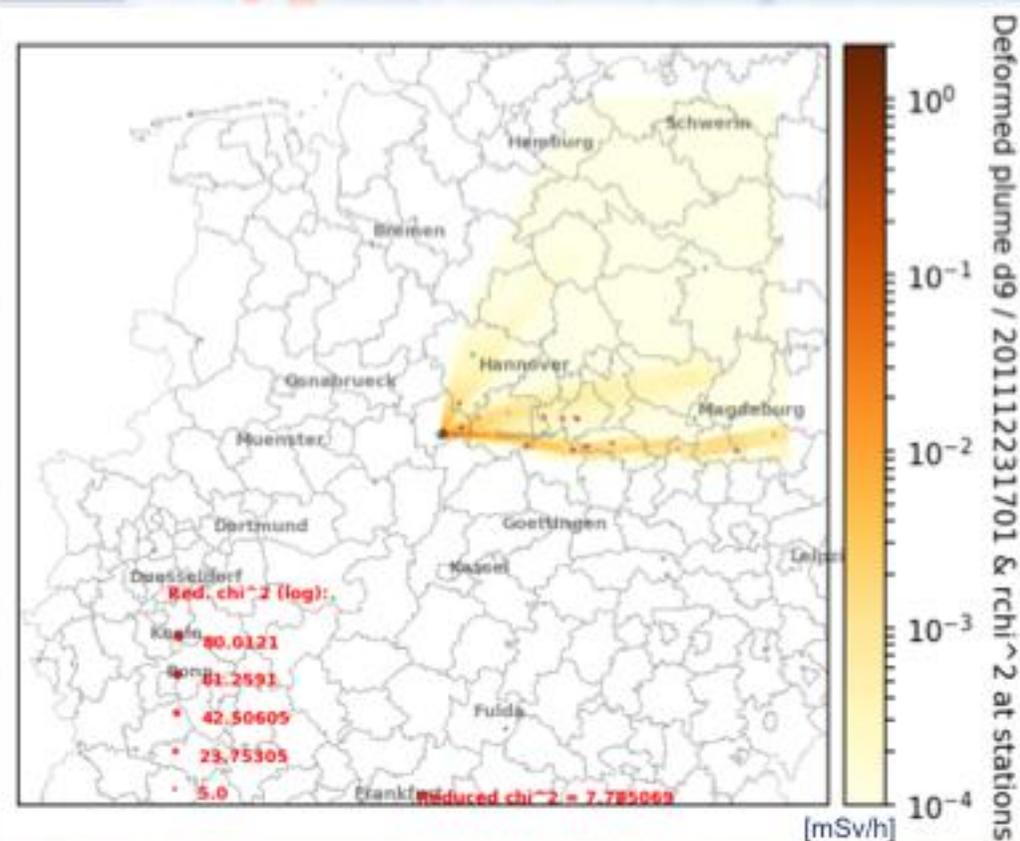
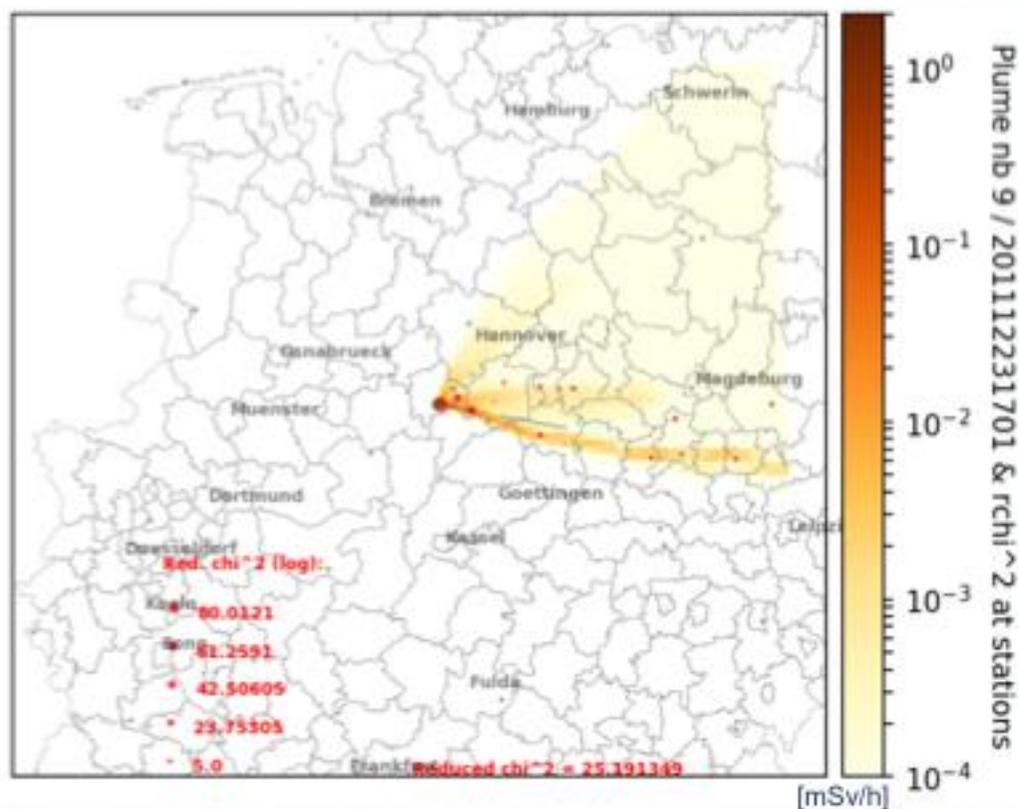
Chart of Dose Uncertainty

optimise monitoring zones or paths

Spatial Optimisation of Sites (up to 12 Criteria)

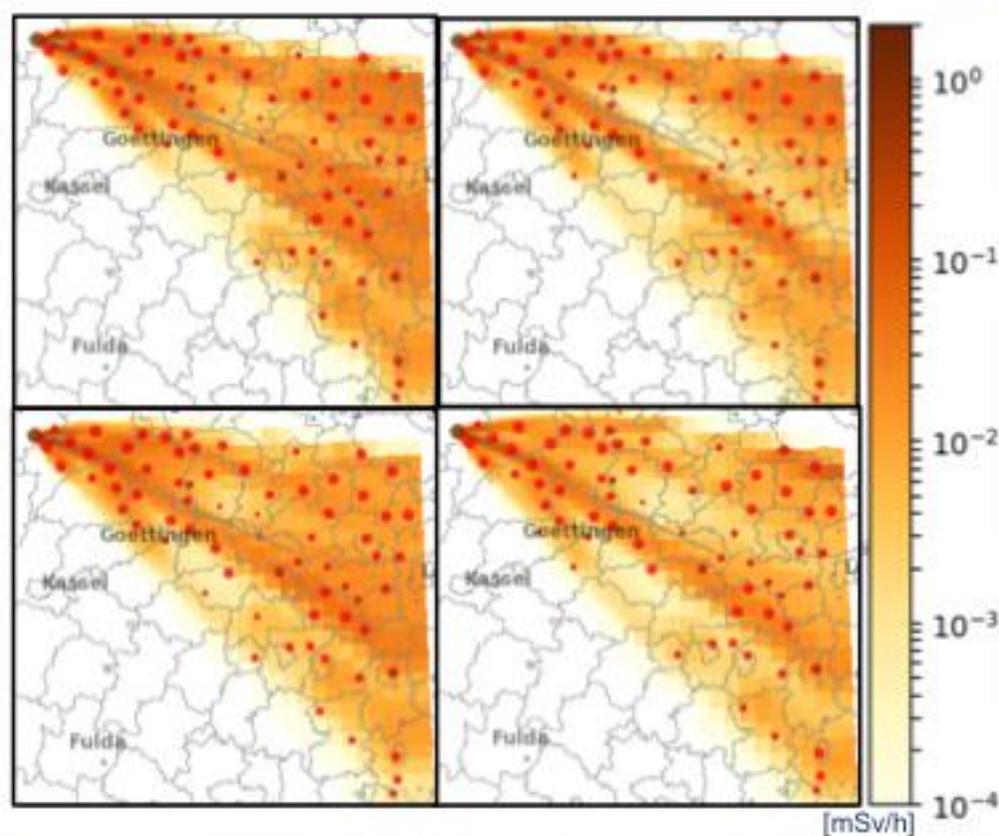
C Mobile Monitoring – Emergency Post-Release / Concept

Model Improvement by slight Deformations:

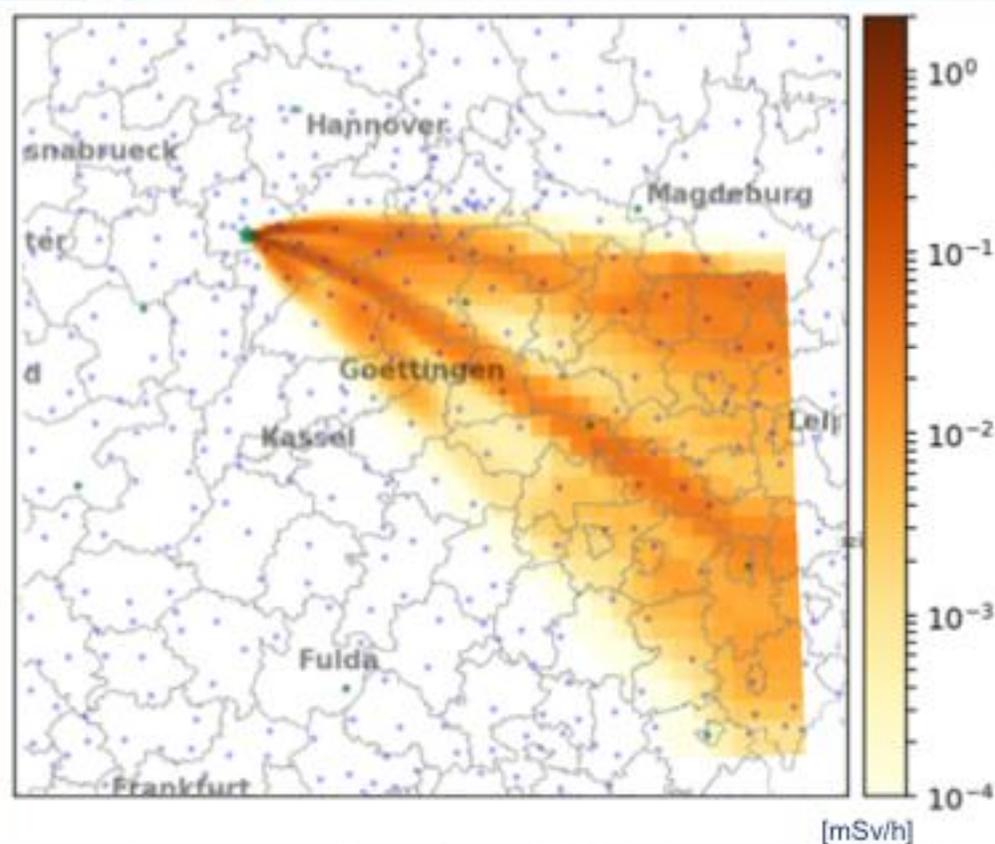


C Mobile Monitoring – Emergency Post-Release / Prop. SE

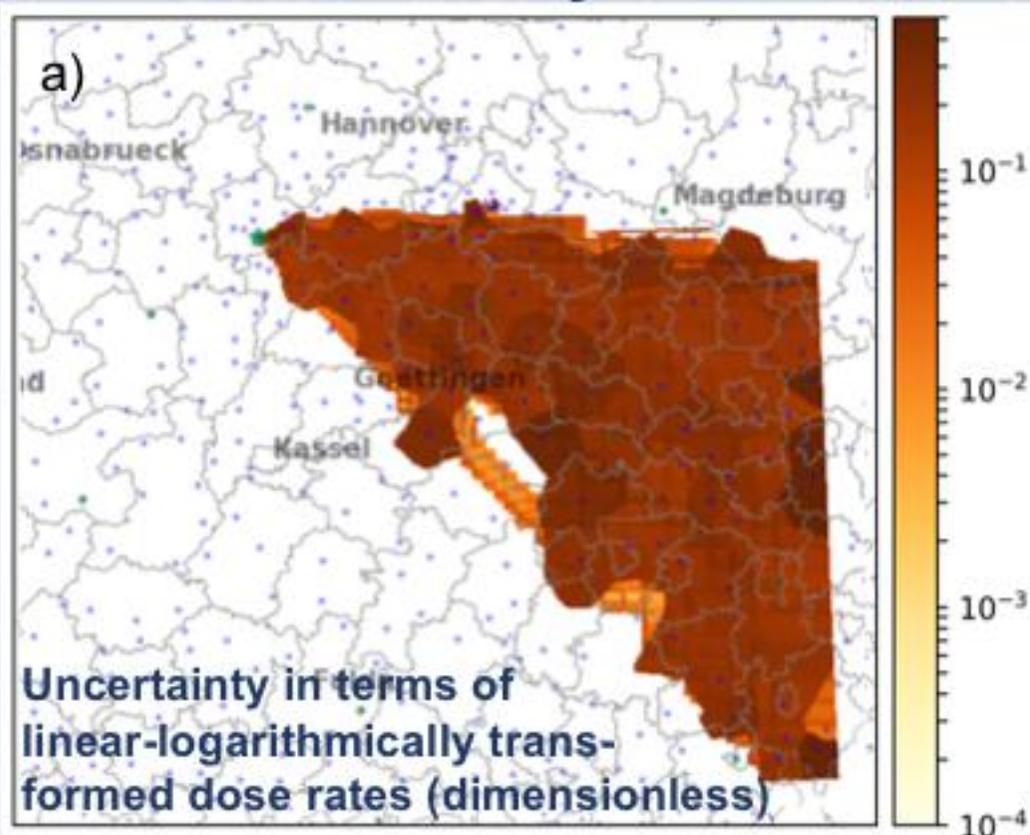
4 Models & Meas. (red points)



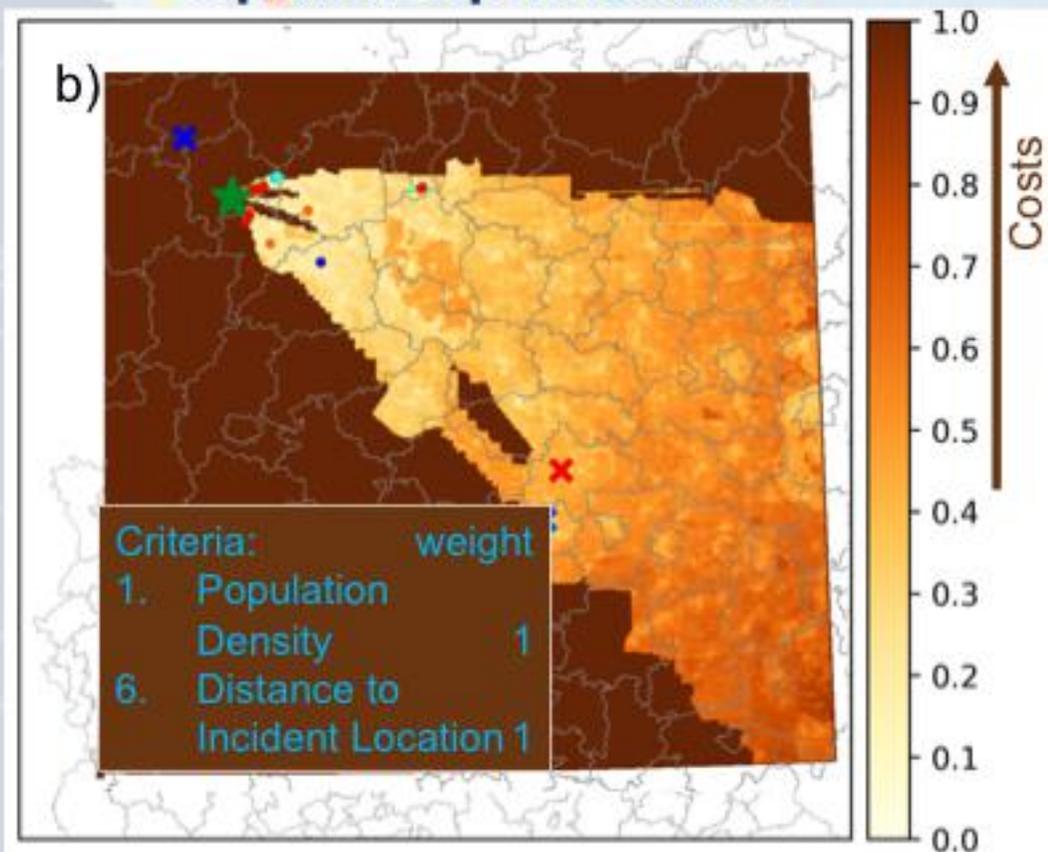
Contamination Chart



Uncertainty Chart

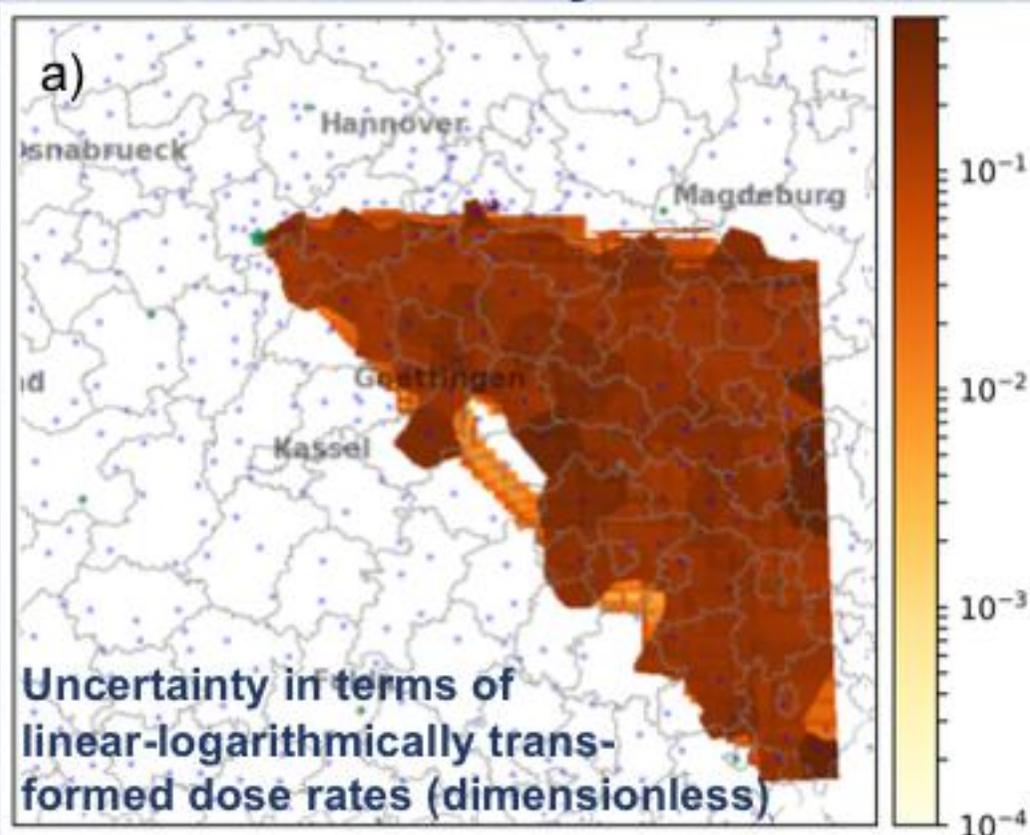


Spatial Optimisation



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

Uncertainty Chart



Spatial Optimisation

