
Surface ecosystem in the assessment of radio nuclide waste
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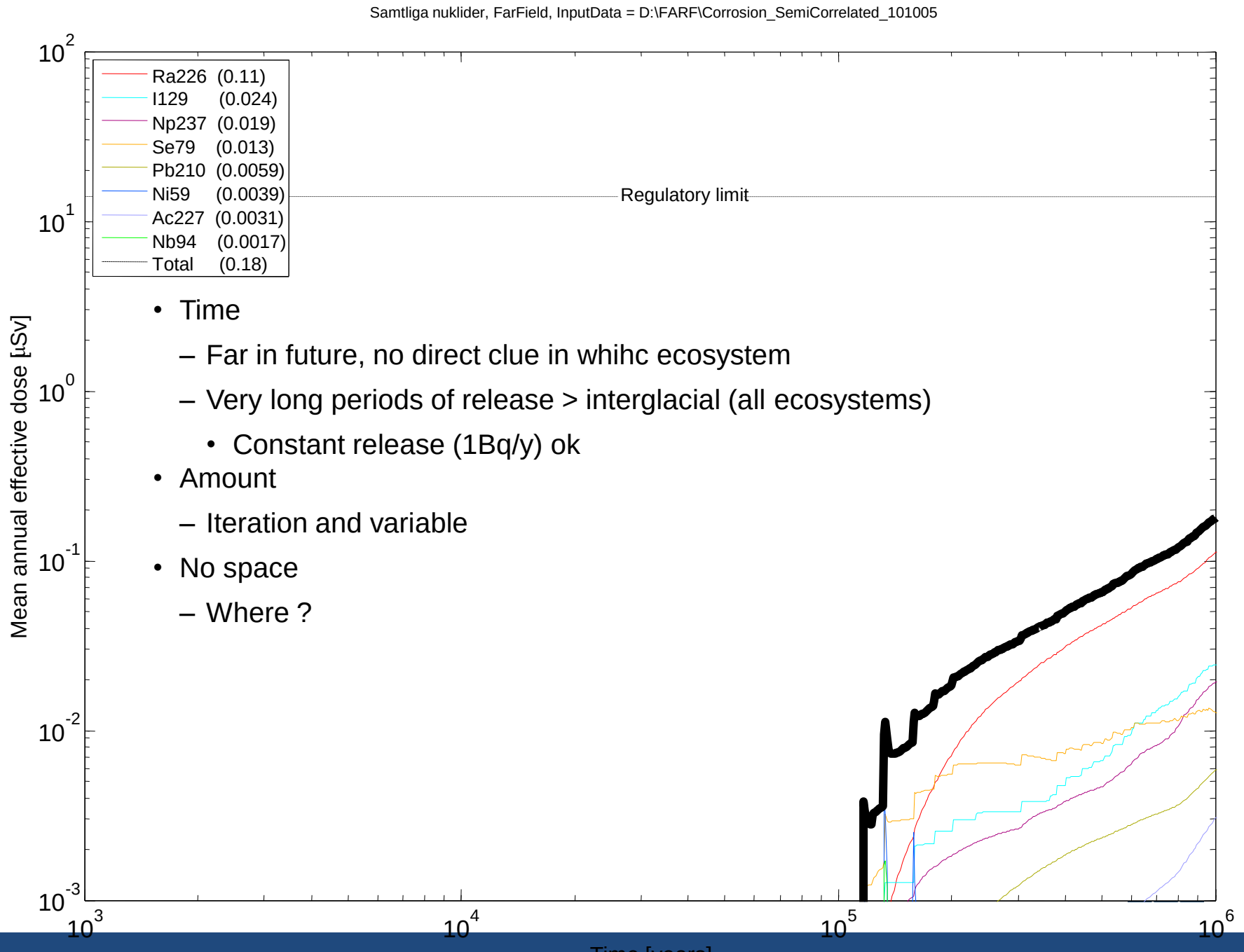
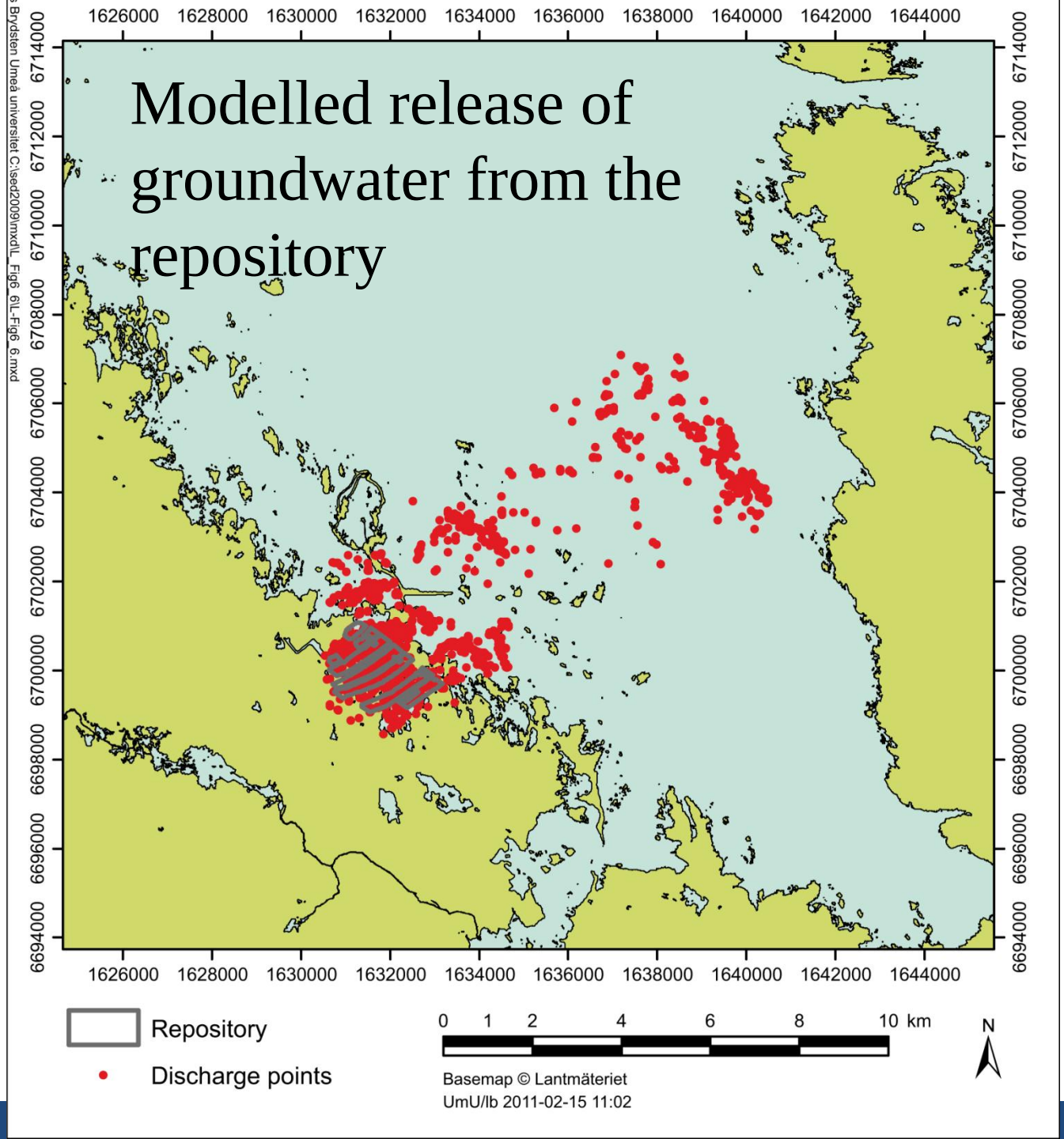
The biosphere in the calculation chain of the assessment of high level waste (Sr-Site)

- Give the dose conversion factor (Sv/Bq) for 40 radionuclides !
  - No time
    - When?
  - No space
    - Where ?
  - No amount
    - How much and which radionuclides are most important?

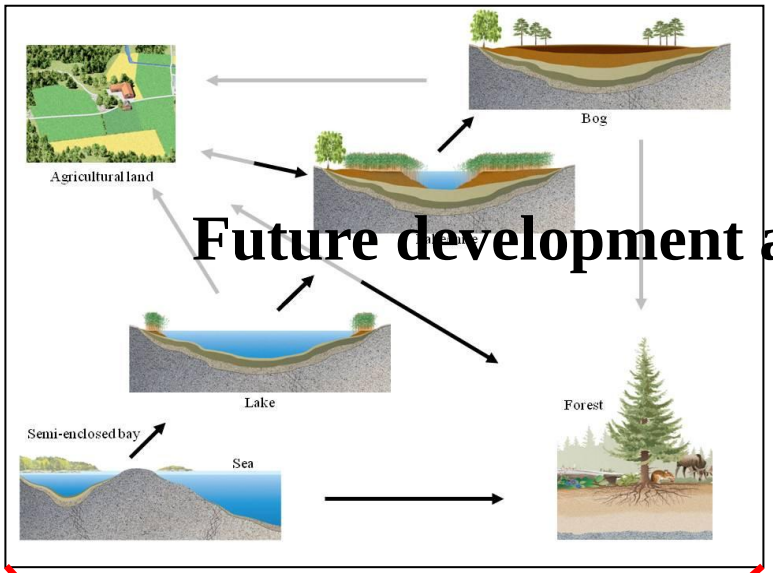

The engineers biosphere

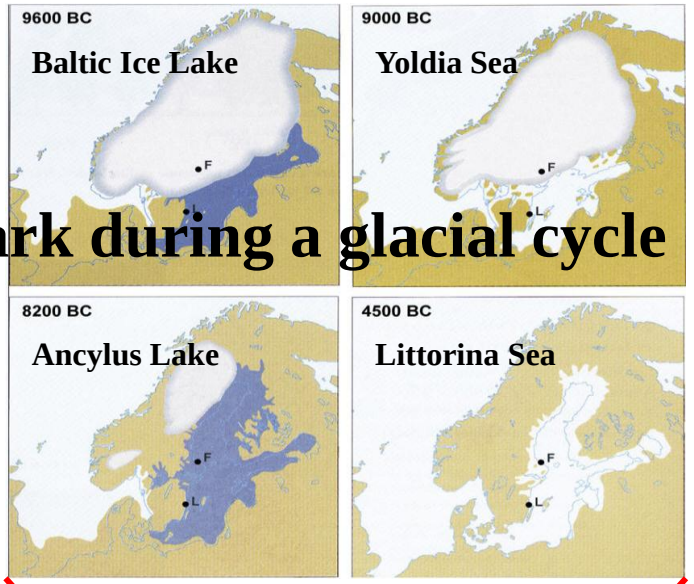


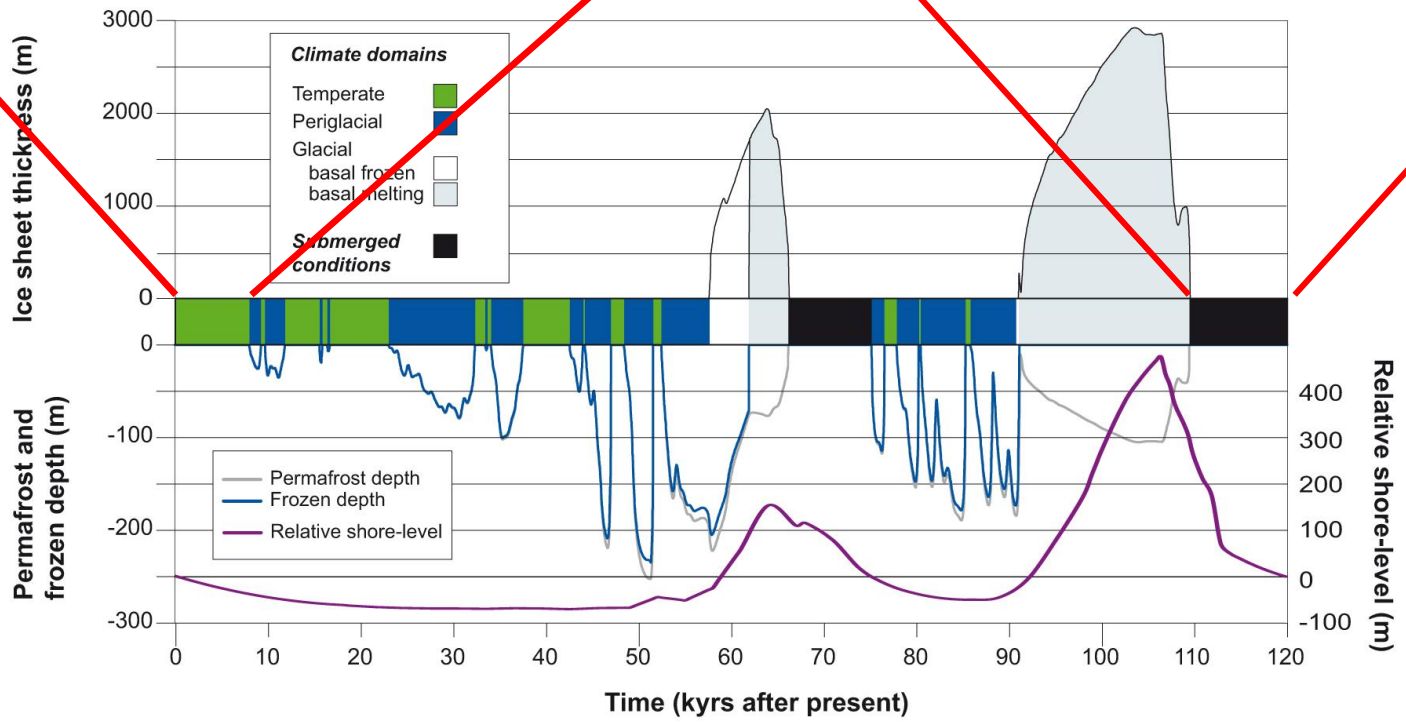
- Time
  - Far in future, no direct clue in whihc ecosystem
  - Very long periods of release > interglacial (all ecosystems)
    - Constant release (1Bq/y) ok
- Amount
  - Iteration and variable
- No space
  - Where ?


Modelled release of groundwater from the repository
1626000 1628000 1630000 1632000 1634000 1636000 1638000 1640000 1642000 1644000
6714000 6712000 6710000 6708000 6706000 6704000 6702000 6700000 6698000 6696000 6694000
Repository
Discharge points
0 1 2 4 6 8 10 km
N
Basemap © Lantmäteriet
UmU/lb 2011-02-15 11:02

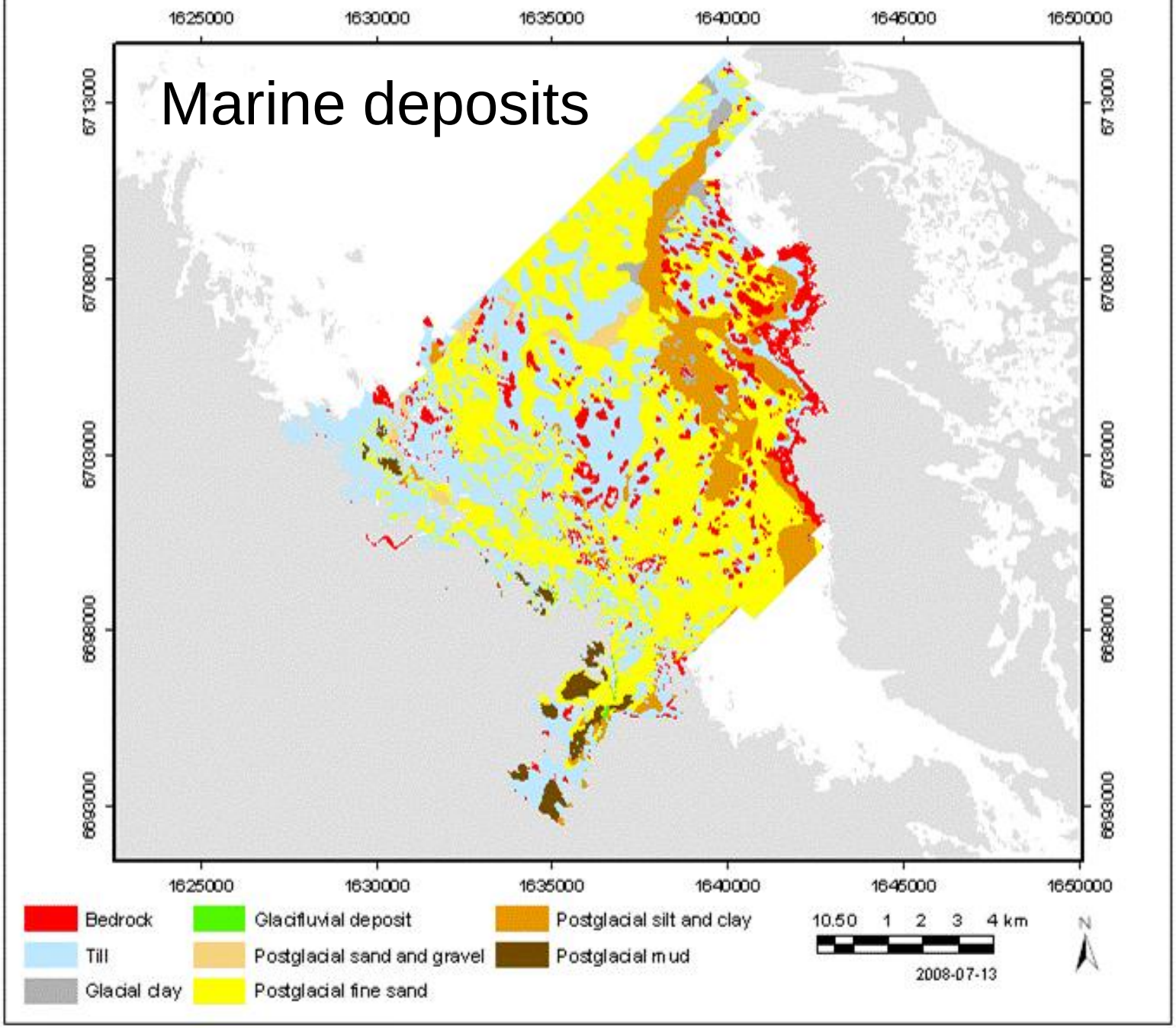
Future development at Forsmark during a glacial cycle

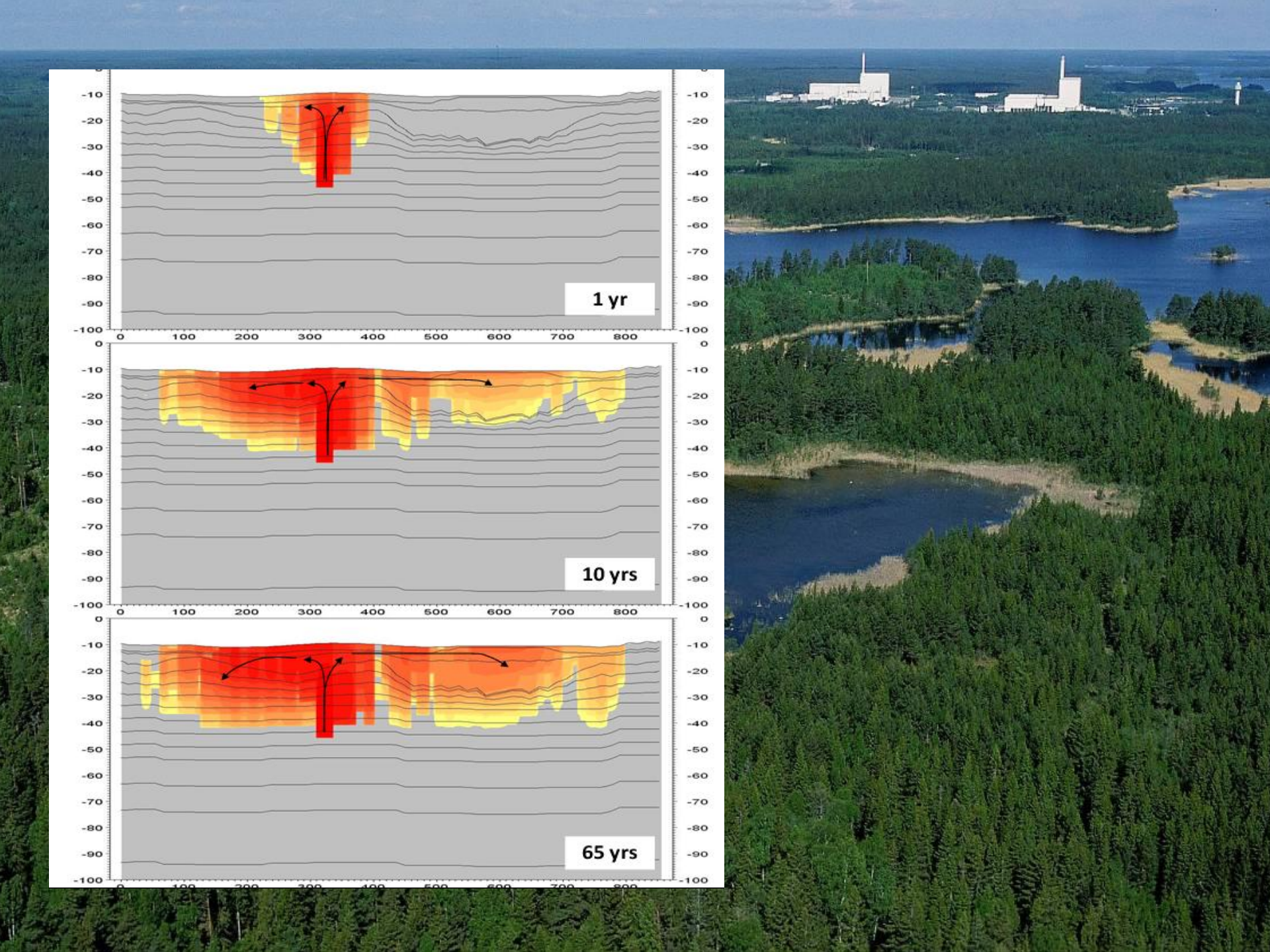




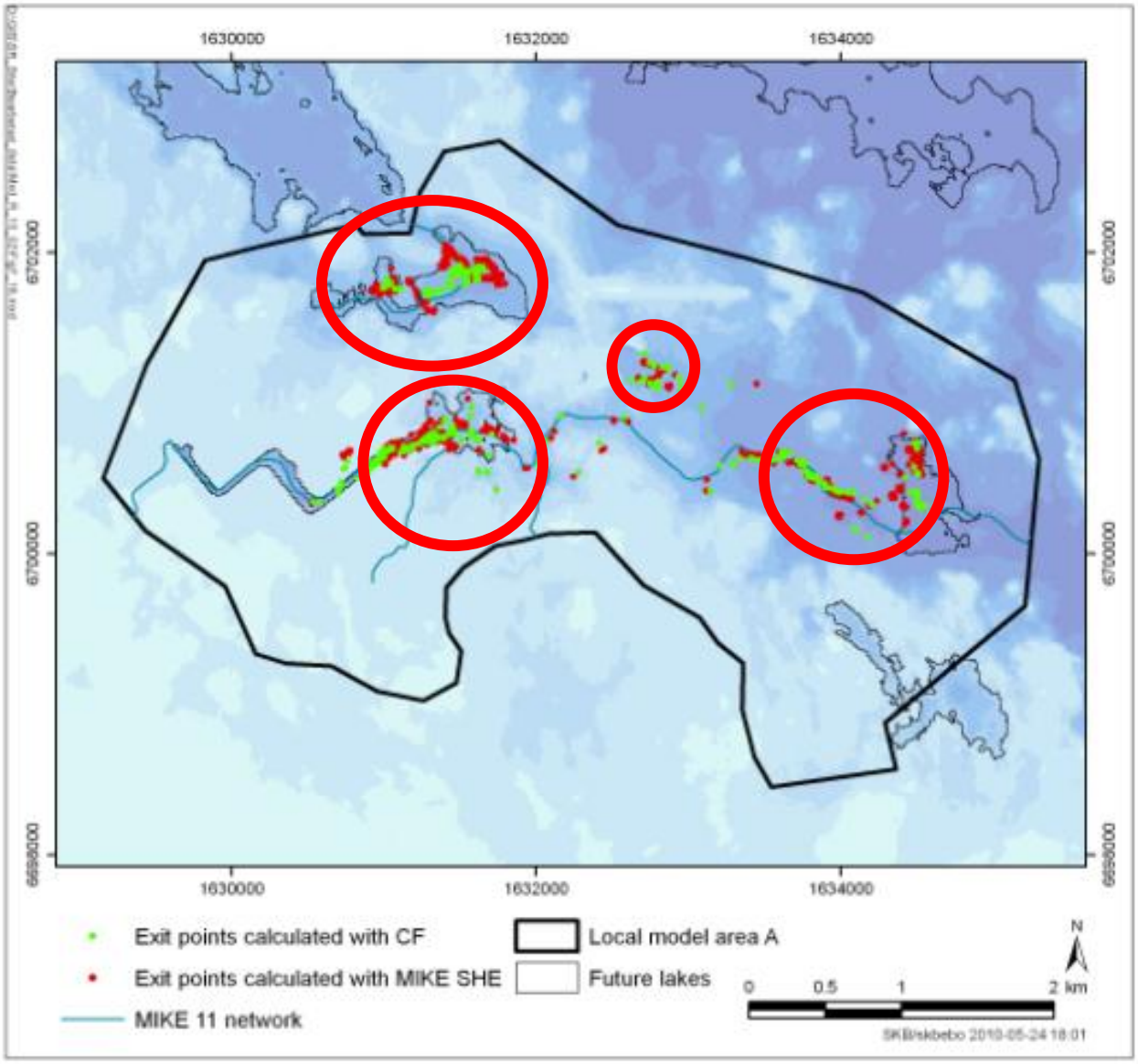


Forsmark today

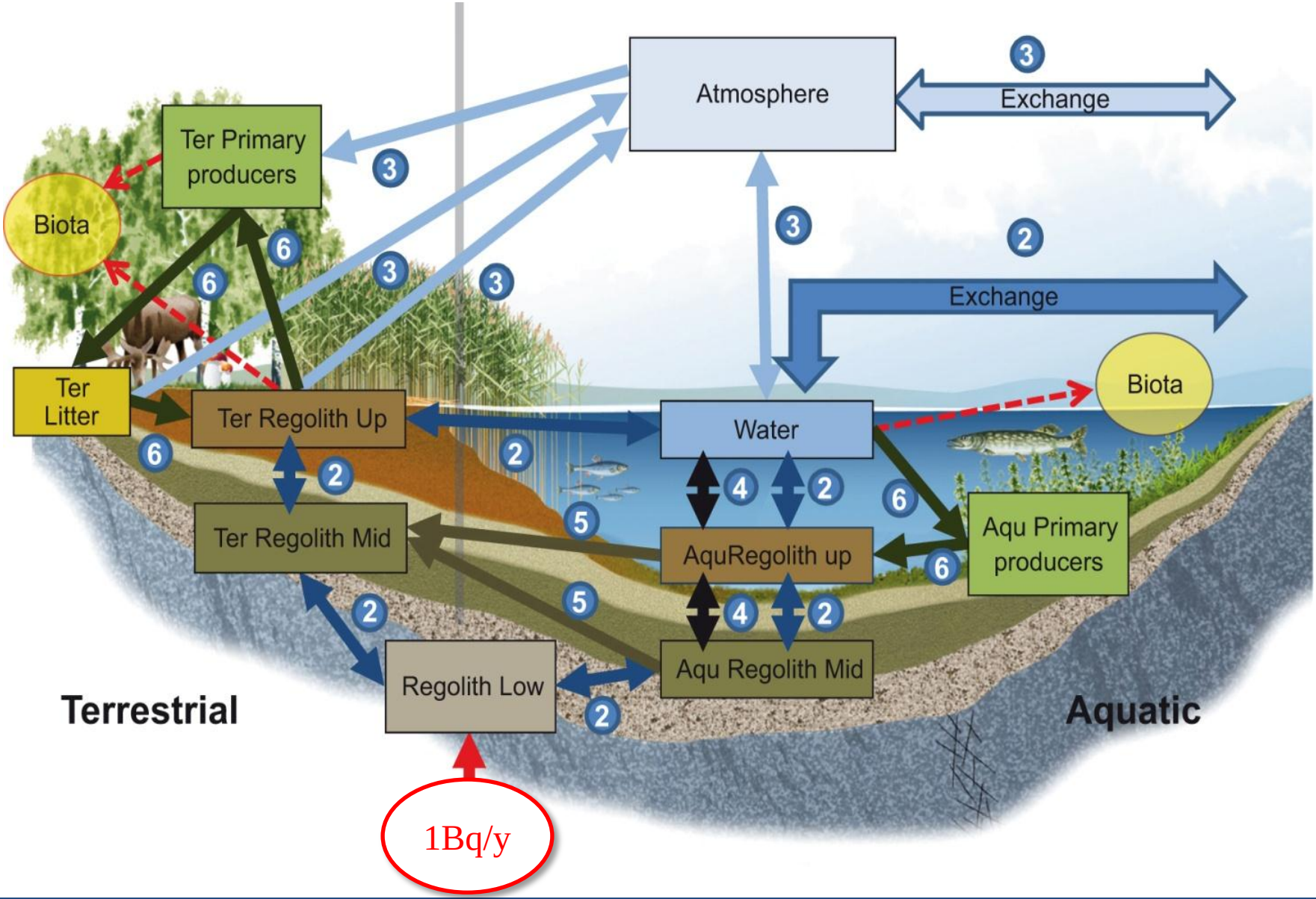

Marine deposits
1625000
1630000
1635000
1640000
1645000
1650000
6713000
6708000
6703000
6698000
6693000
Bedrock
Till
Glacial clay
Glacifluvial deposit
Postglacial sand and gravel
Postglacial fine sand
Postglacial silt and clay
Postglacial mud
10.50 1 2 3 4 km
2008-07-13
N


1 yr
10 yrs
65 yrs

Biosphere object



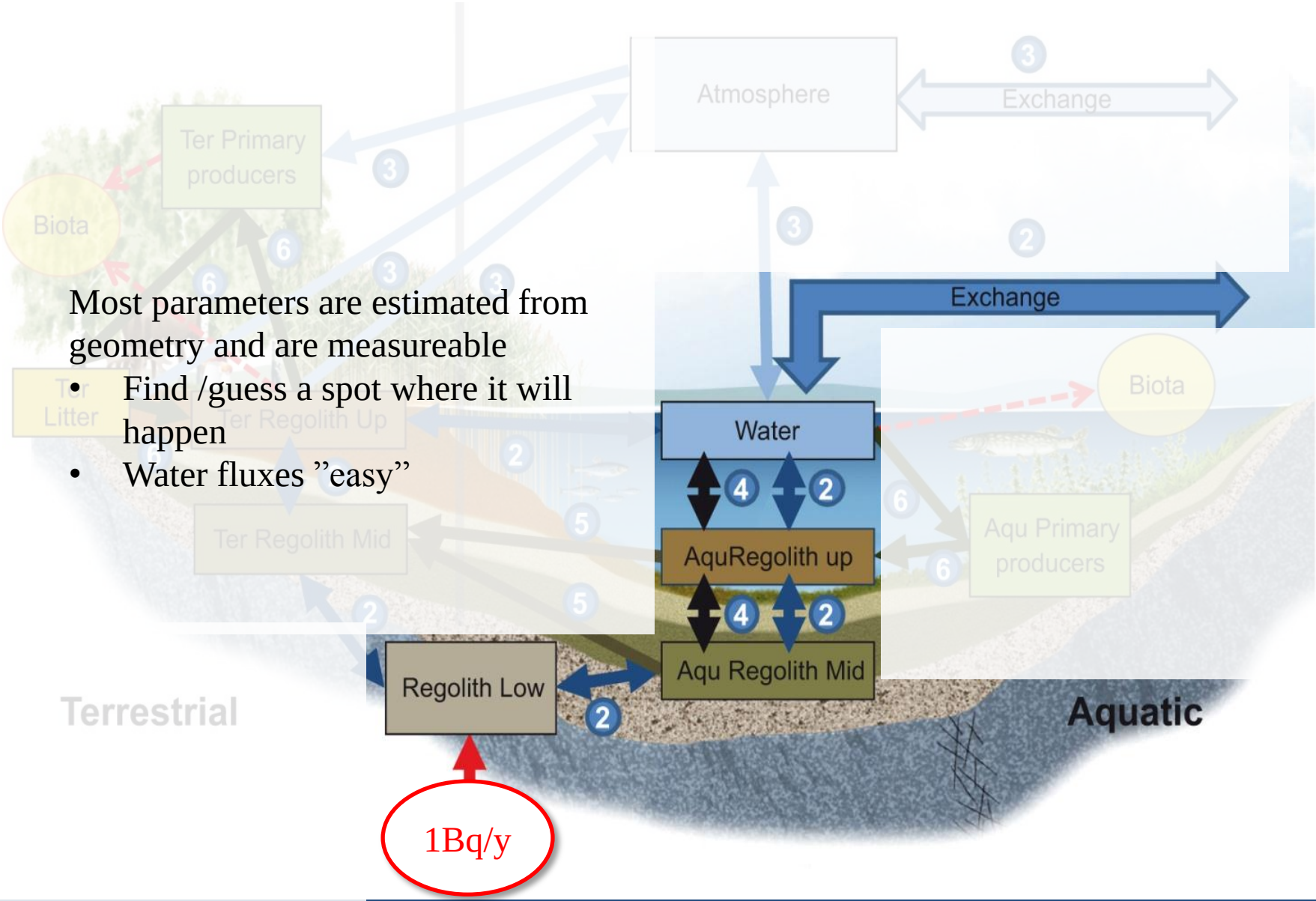
Radionuclid model



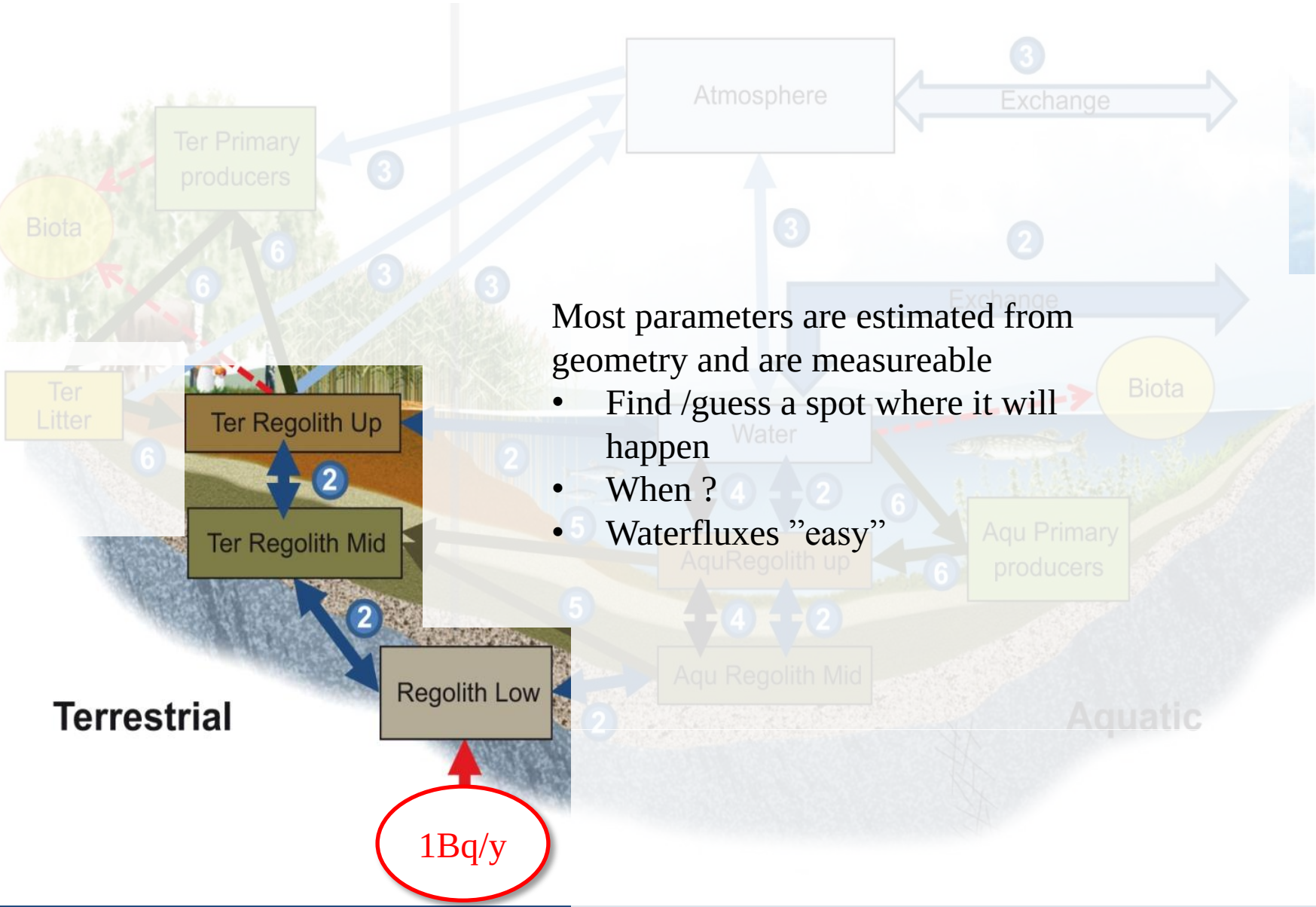
Radionuclid model for the assessment

Most parameters are estimated from geometry and are measureable

- Find /guess a spot where it will happen
- Water fluxes ”easy”



Radionuclid model for the assessment



Most parameters are estimated from geometry and are measureable

- Find /guess a spot where it will happen
- When ?
- Waterfluxes ”easy”

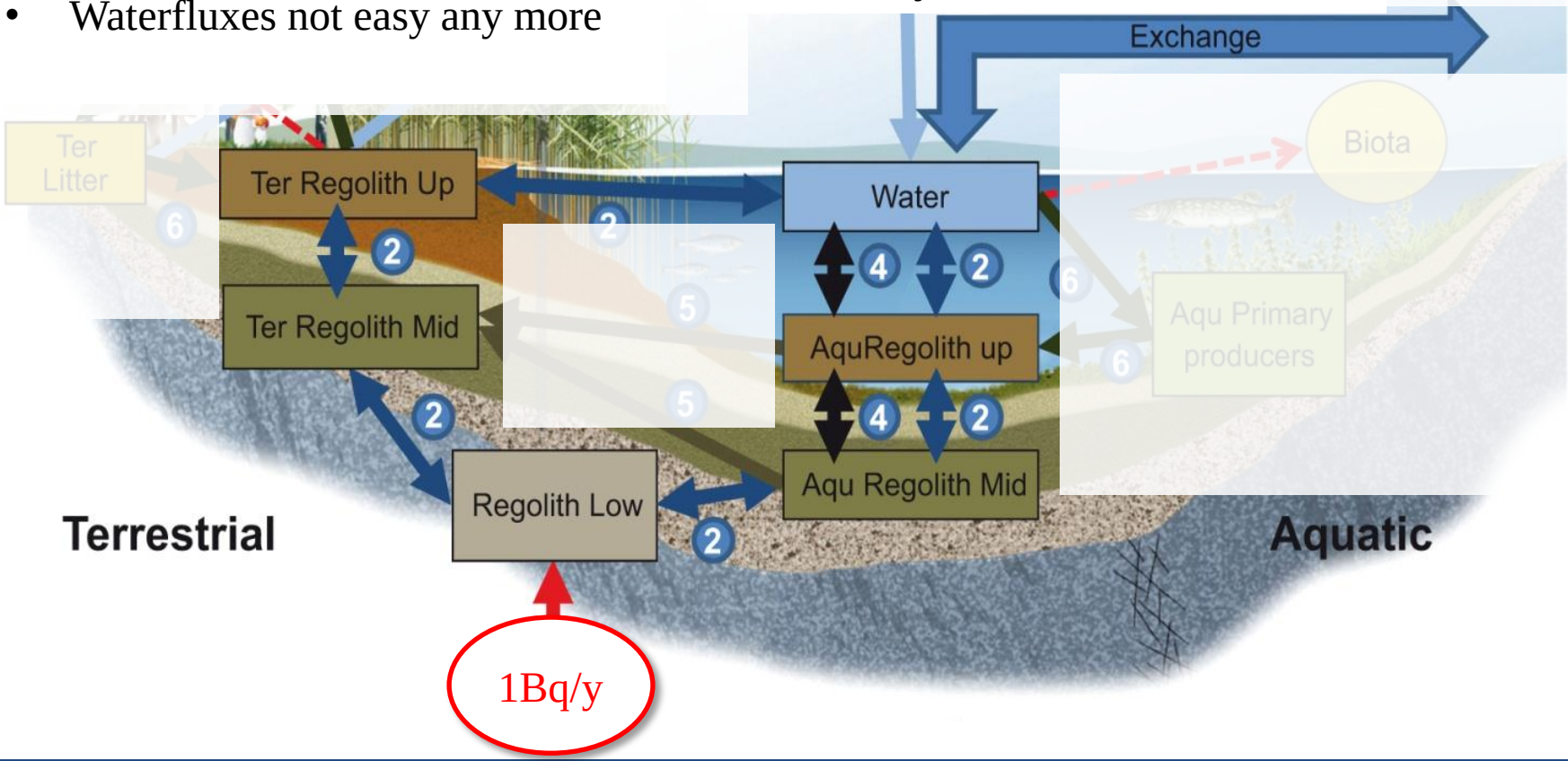
Radionuclid model for the assessment

Most parameters are estimated from geometry and are measureable

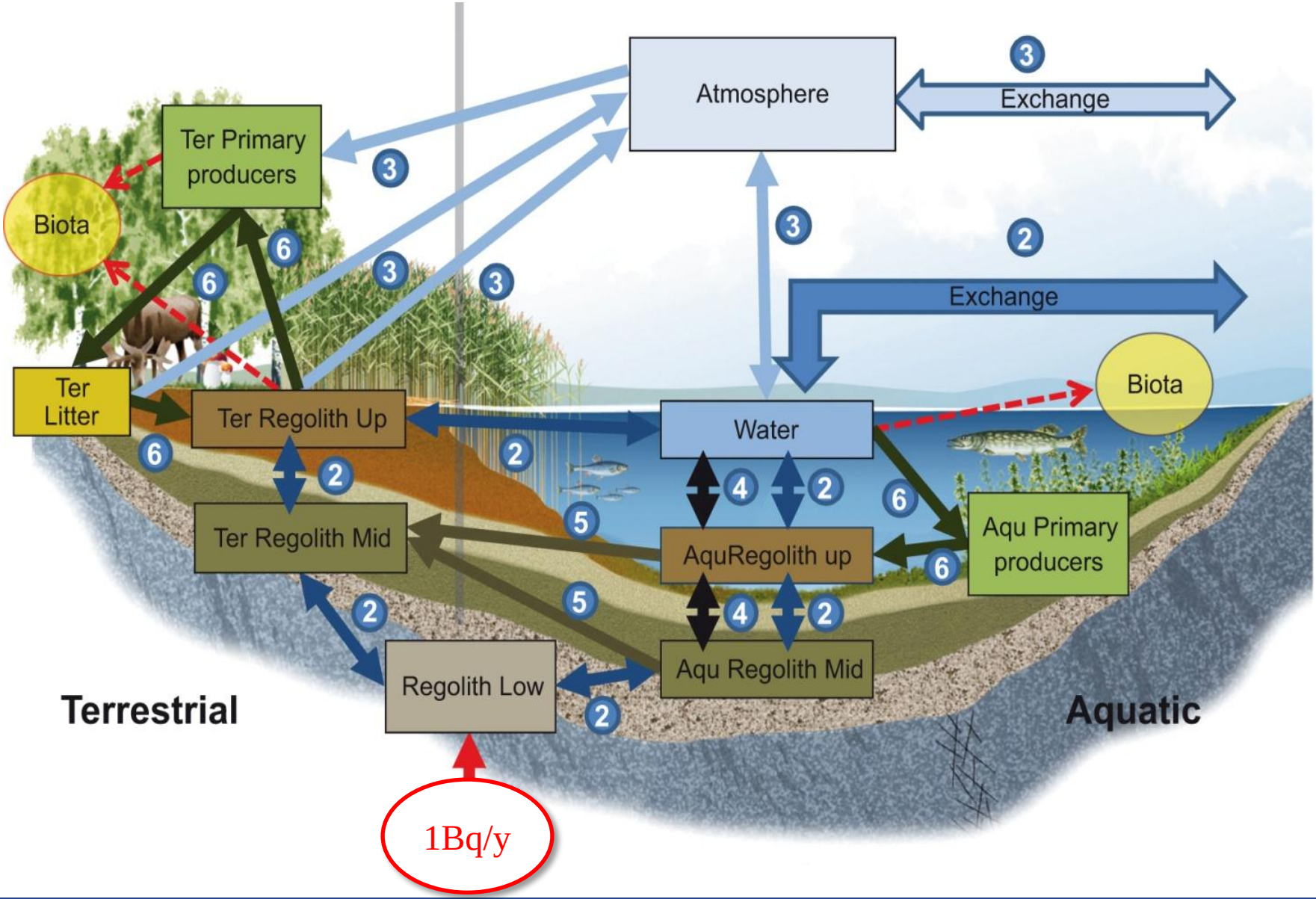
- Find /guess a spot where it will happen
- When ?
- Waterfluxes not easy any more

MikeShe gives fluxes

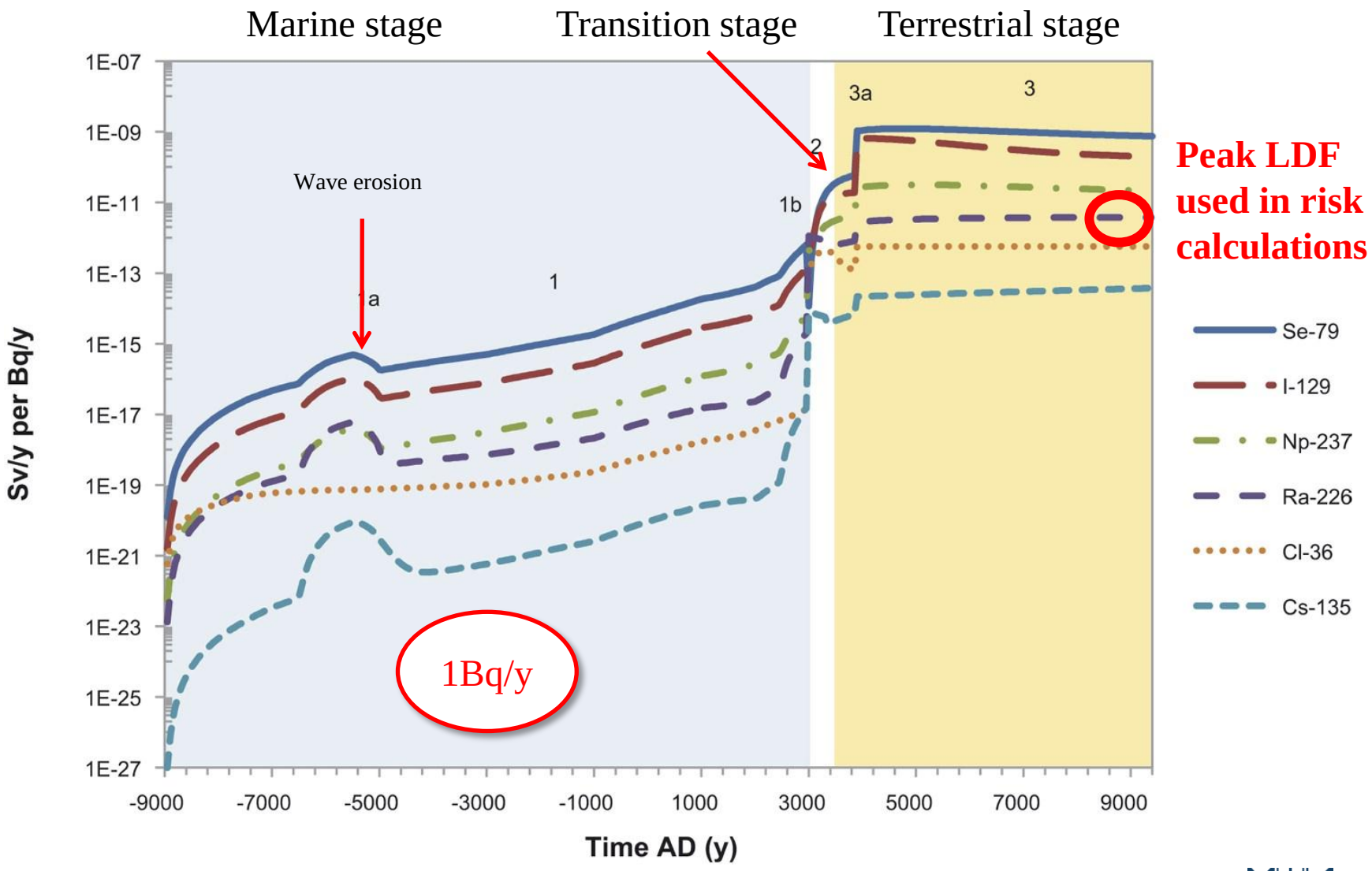
- Find /guess a spot where it will happen
- When ?
- Do the job !



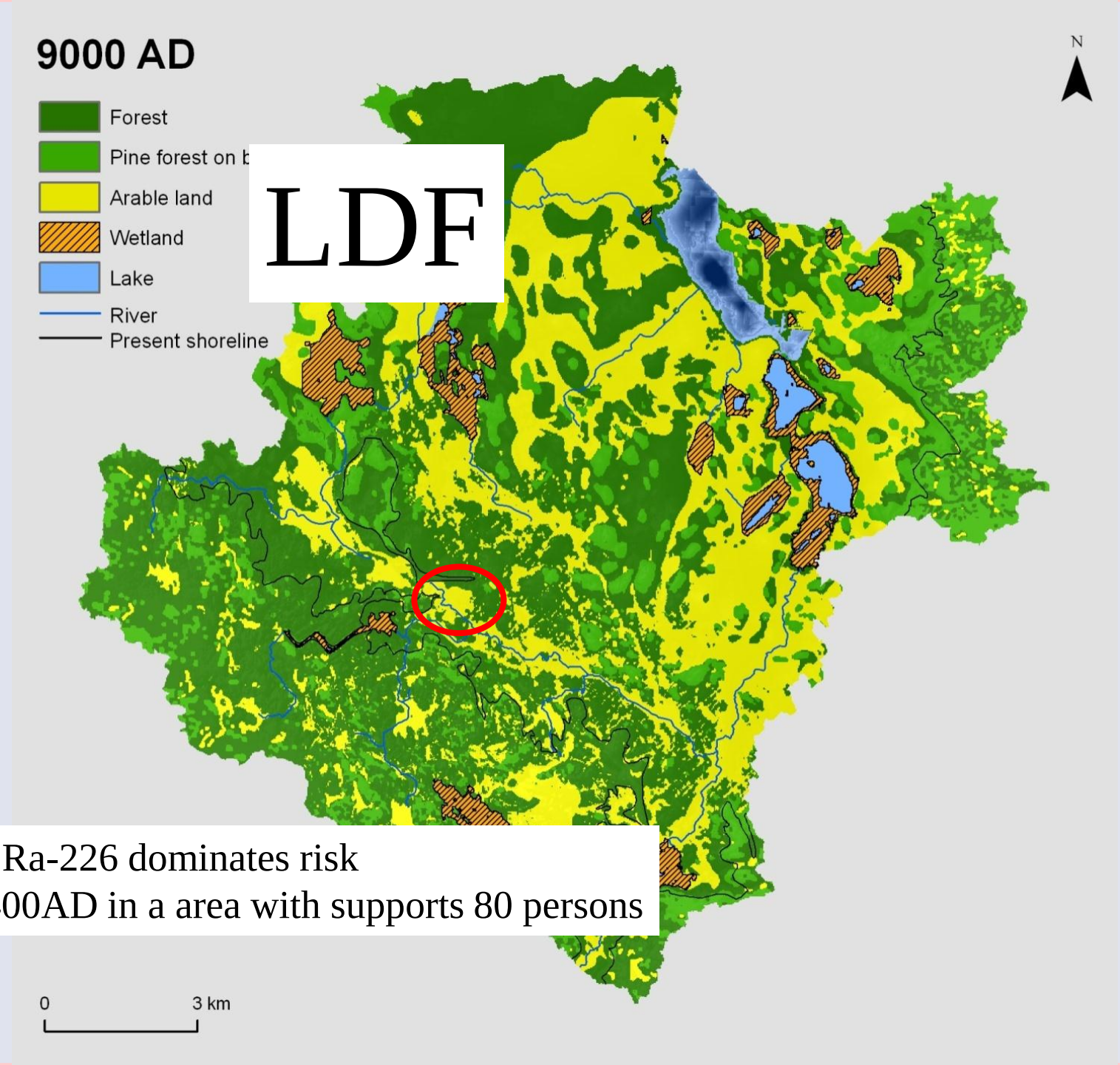
Radionuclid model



Maximum LDF



Peak LDF used in risk calculations



SR-Site Ra-226 dominates risk
Max 9400AD in a area with supports 80 persons