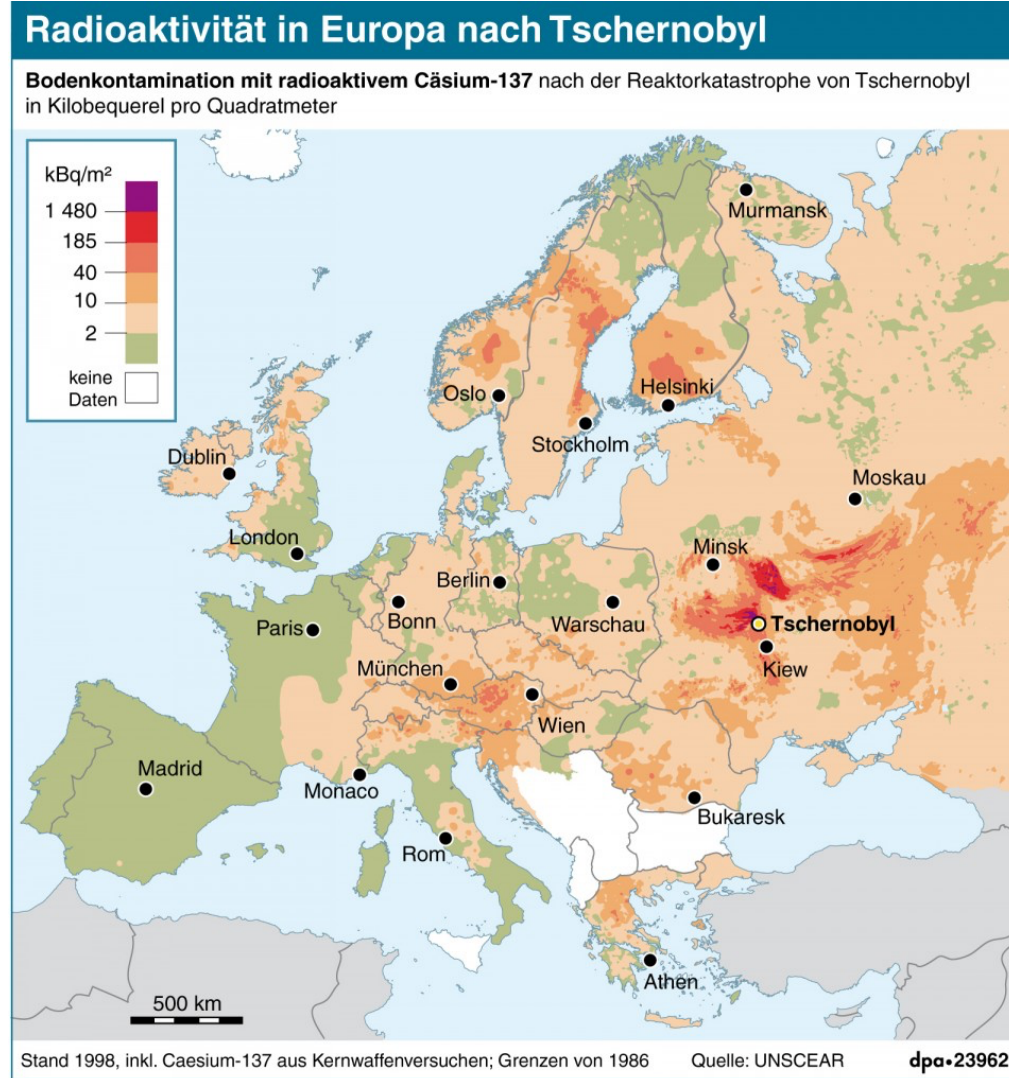


EXERCISES

Problem 1:



Following a radiological event, a local population north of Helsinki relies on reindeer meat as a staple protein source during the 6-month winter season. In winter, reindeer mostly eat Lichen.

Aggregated Transfer tells us how much radioactivity moves from the soil surface into the animal's muscle, assume $1 \text{ m}^2/\text{kg}$ for winter (for comparison: $0.1 \text{ m}^2/\text{kg}$ in summer due to more grass/herbs/plants with roots being larger part of the diet).

Calculate an average reindeer meat contamination for the worst case in Finland based off the map above. The average reindeer enthusiast consumes 20 kg of reindeer meat per year. Calculate the total annual committed effective dose. Compare this to the typical global average annual background dose.

Problem 2:*Inhalation of ^{131}I*

The measured concentration of ^{131}I in a laboratory is 55 Bq/m^3 . What committed effective dose a person receives for 15 minutes light activity in this laboratory?

Hint: During light work, a reference person inhales 20 liters (0.02 m^3) of air per minute. This corresponds to $60 \text{ mins.} \cdot 0.02 \text{ m}^3/\text{min.} = 1.2 \text{ m}^3$ per hour. The volume of air inhaled in 15 mins. is then $V = 1.2 \text{ m}^3/\text{h} \cdot 0.25 \text{ h} = 0.3 \text{ m}^3$.