The Dinkel valley (see the picture of the podzol profile, described along the Dinkel river, in Lutterzand)

- Dinkel is a small river originating from woody marshlands near the town of Holtwick, Germany
- The Dinkel stretches on its way to the north, enters the Netherlands, leaves it again, and re-enters as the Vecht river near Grambergen. From their on it continuous for about 60 km until it flows in to the 'Black Water' near the city of Zwolle.
- contains braided riverine deposits from late glacial origin
- Holocene streams predominantly follow river courses dating back to the Weichselien;
- Outside the active stream beds deposition of mostly very thin layers of clay (Singrave Formation)
- In numerous locations (Holocene)cutted meanders do occur, filled with peat material

Dinkel river characteristics:

- a narrow, meandering, shallow rain river;
- cuts into the Pleistocene coversands
- unable to take the volumes of water accumulating during periods of heavy rainfall, hence large areas near to the Dinkel are/were frequently flooded
- interesting features: meander cut-offs, point bar complexes, swales, slip-off slopes

Podzolisation and podzols

- podzols form through transport of organic matter, iron and aluminium in solution, from the topsoil to deeper horizons
- acids in the topsoil dissolve Fe and Al from minerals;
- organic matter-metal complexes are transported with percolating rainwater to deeper parts
- this transport is halted when: (1) the organic matter-metal complex becomes saturated and precipitates; (2) the organic matter is decomposed by micro-organisms; (3) the water transport may stop
- influence on ph: Fe and Al form complexes with OH
- mineral transformation in podzols;
- physical and chemical weathering in eluvial horizons results in finer sands and silts than in the parent material' illuvial horizons show higher content of silt and clay.

Podzol description WRB:

- acid soils with a blackish/brownis/reddish subsoil with illuvial iron-aluminium-organic compounds
- 'soils with a subsurface horizon that looks like ash due to strong bleaching by aggressive organic acids' → from Rusisan pod = under, zoal=ash

Characteristics:

- diagnostic horizons: presence of

- (1)a spodic horizon: amorphous compounds of organic material and aluminium and or without iron or other cations have accumulated
- (2)a albic horizon: leaching out of organic matter, aluminium, iron
- Soil forming conditions:
  - cool and wet climate, but not exclusive → tropical podzols on sandy riverine/coastal sediments
  - Quartzitic parent material (Al. Fe) → coarse sandy sediments
  - heath a/o coniferous vegetation cover (acid conditions)
- Geography: mainly northern hemisphere; troical podzols in: also coastal zones in Indonesia, rio negro, guyanas in south america, westren zambia

Properties

- coarse texture: sand – sandy loam (< 10% clay)
- low water retention capacity (< 50 mm per meter soil depth) → moisture stress
- vertical water movement usually free and rapid
- acid soils: surface-ph 3.5 – 4.5; lower-ph up to 5.5.
- CEC mainly caused by presence of organic compounds
- Low biological activity (high C/N ratio in organic matter)
- Slow degradation of organic materials

Podzols in NL

- A considerable portion of the Netherlands is covered by sands.
- Podzols are common in these sands.
- An example of a typical podsol profile description is given next.

Typical Podzol Profile		
Horizon	**Depth in cm**	**Characteristics**
A	0-5	Very dark grey, humose sand.
E	5-18	Humus arm strongly bleached sand; humus only occurs as isolated spots and in irregularities on the sand particles.
B	18-23	black, humus rich sand; the humus occurs as a black amorphous mass filling most of the pores in between the sand particles; a thin iron band forms the lower boundary of this horizon.
B	23-50	dark reddish brown, moderately humus rich sand, changing into yellowsh brown moderately humus poor zand; in the higher part amorphous humus fills up the spaces in between the sand particles, in the lower parts of the horizon it mainly occurs as thin coatings on the sand particles (together with iron).
BC	50-90	Gradual change into the parent material, together with decreasing humus content, the humus coatings getting thinner; The colour becomes increasingly more 'blond' because of the pronounced iron skins.
C	>90	Light yellowish brown sand with very low humus content; Iron coatings on the sand particles.