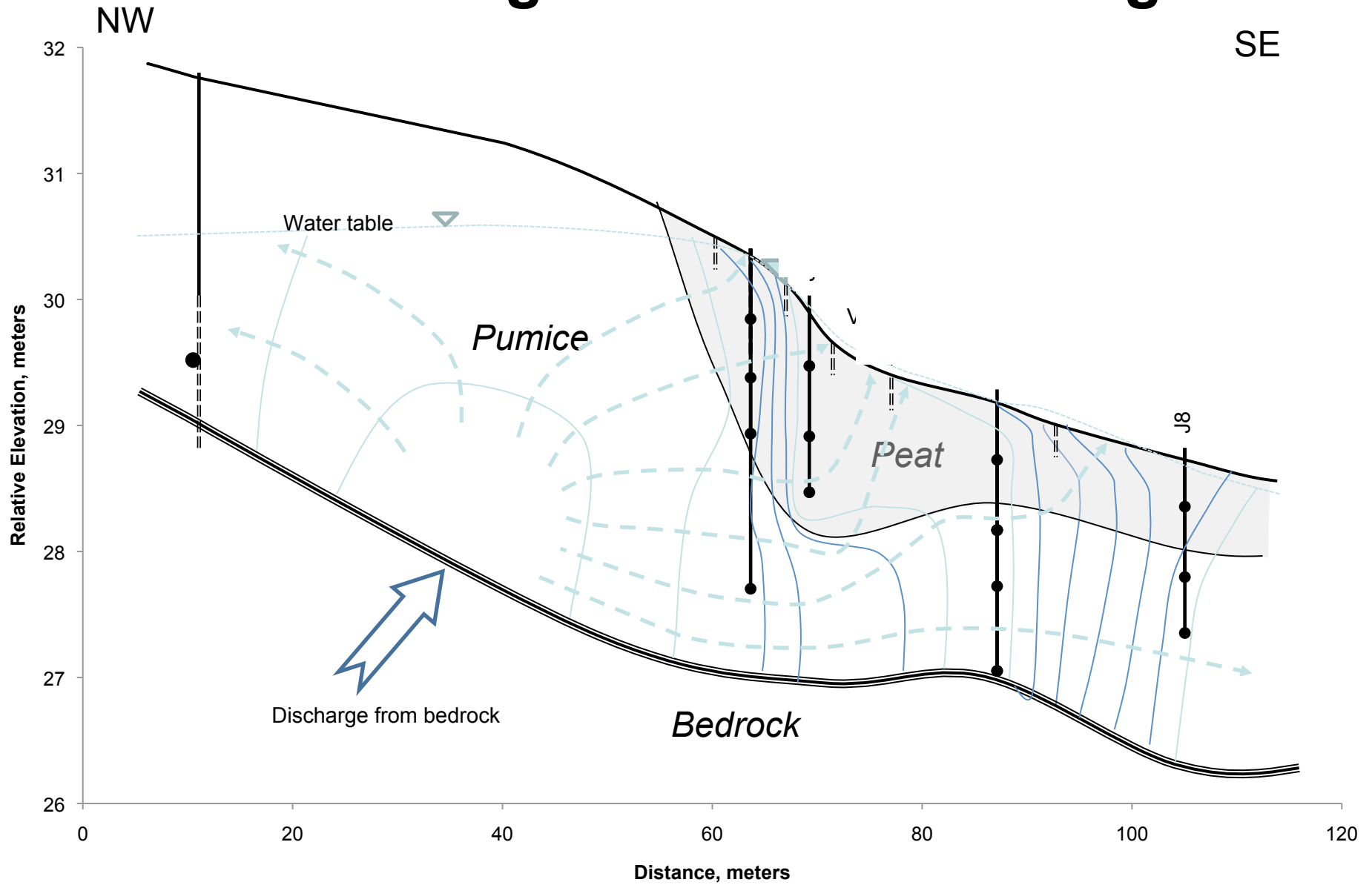


Groundwater-dependent ecosystems (**GDEs**)

ecosystems and species that rely on access to groundwater to maintain ecological structure and function, for at least some part of the year

1. Direct groundwater discharge



1. Direct groundwater discharge



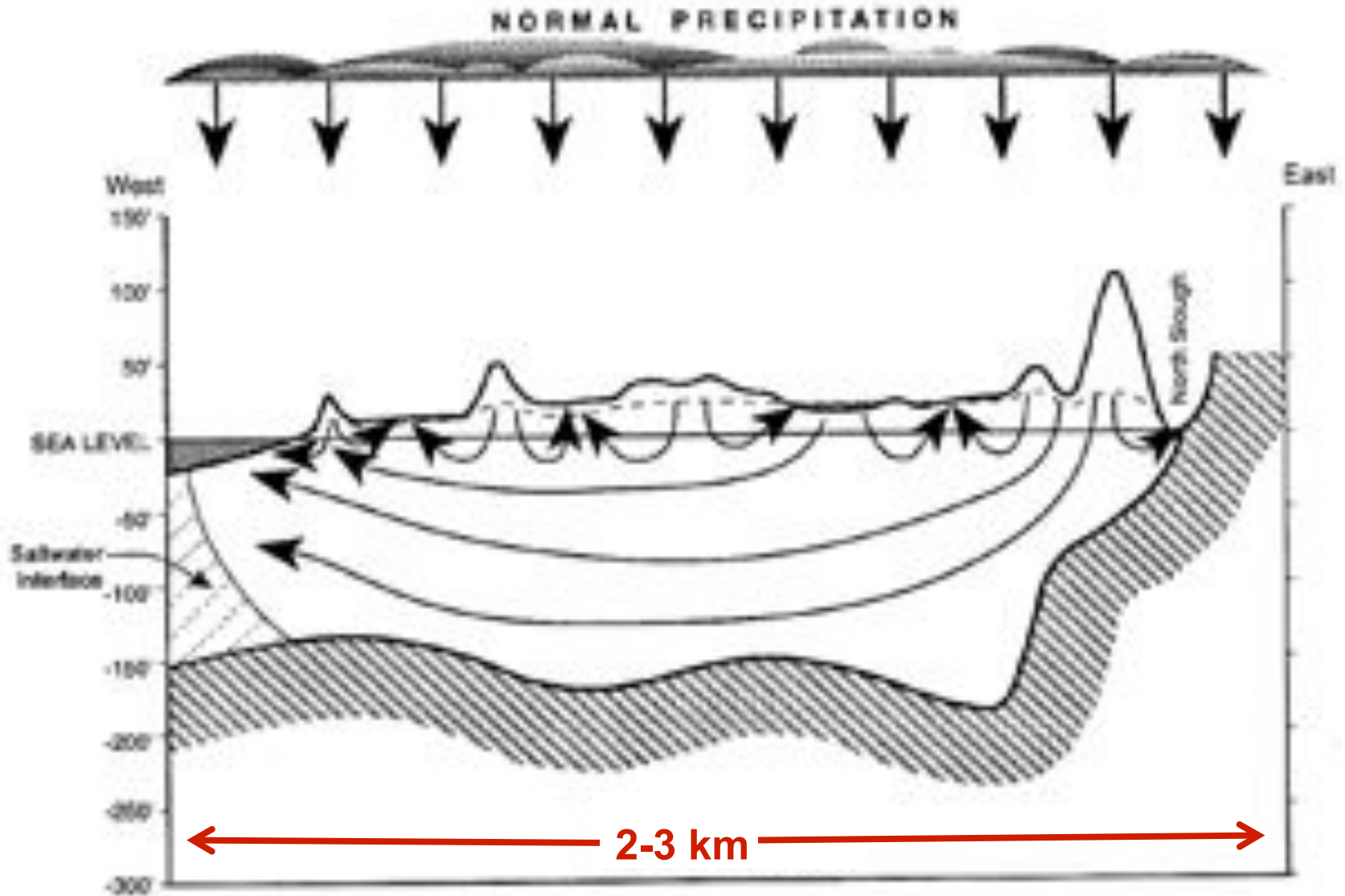
spring

static hydroperiod

fen



2. Outcropping of the water table



2. Outcropping of the water table



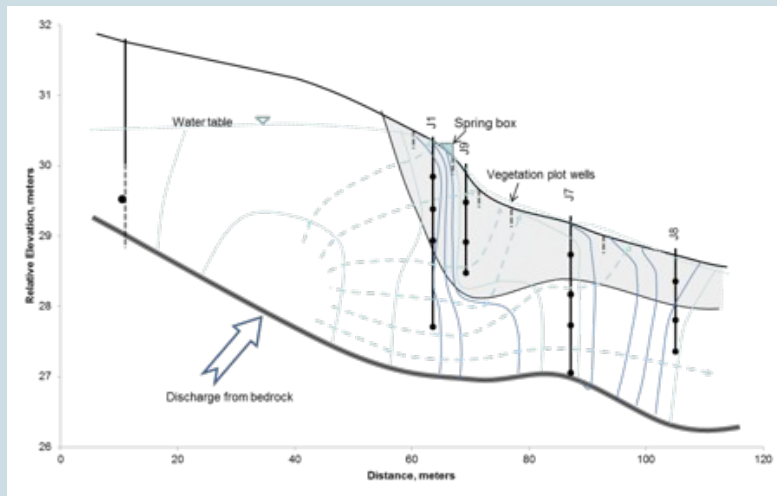
dynamic hydroperiod



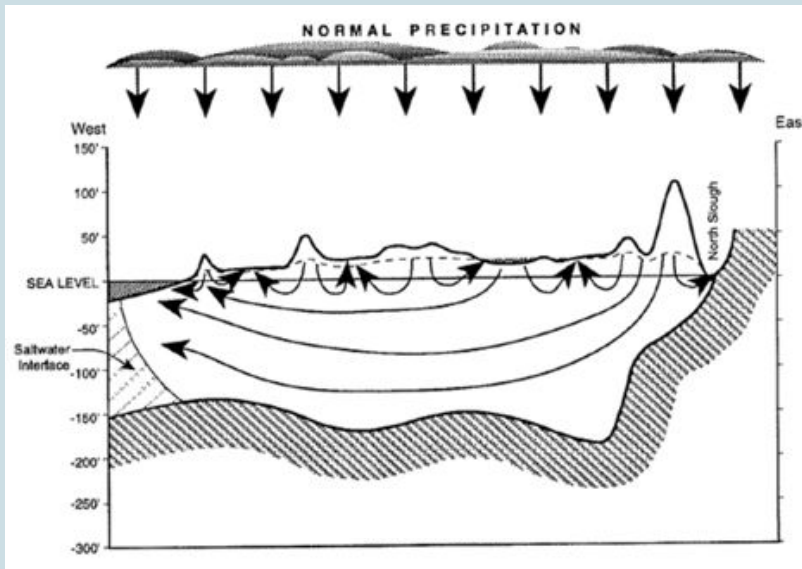
Stresses

- **climate change**
- **groundwater extraction**
- groundwater contamination
- direct impacts (e.g. filling, draining)
- invasive species

Evaluating climate change effects



- **groundwater recharge / discharge**

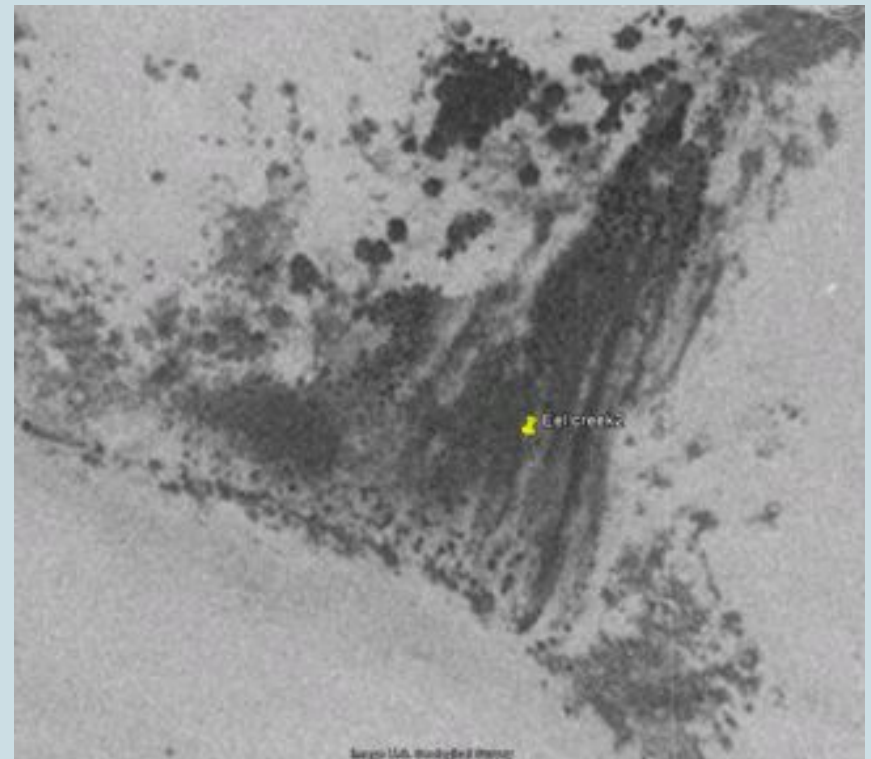


- **timing & amount of precipitation**

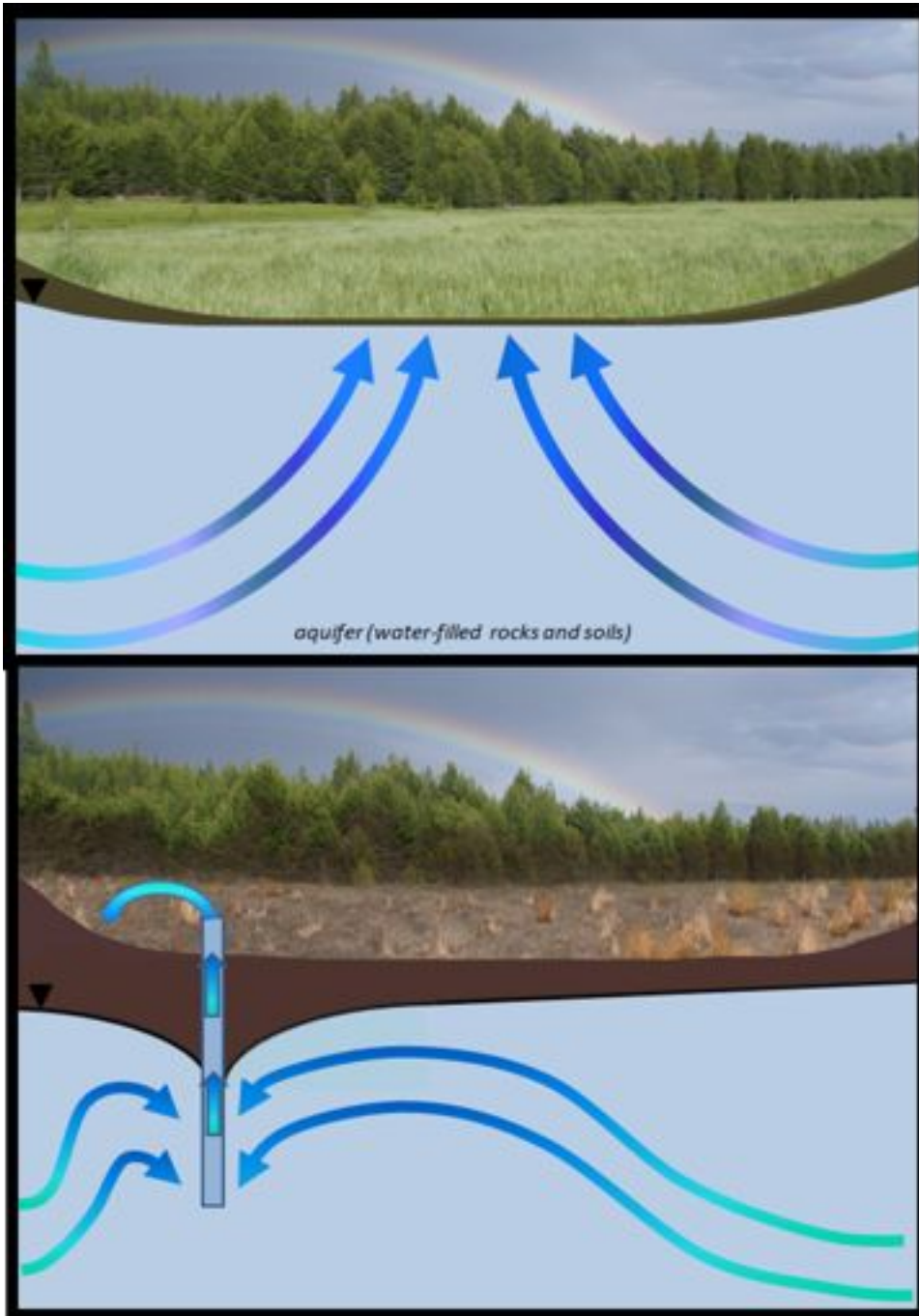
Wetland hydroperiod: natural range of variation



Feb 2006



May 1994



Groundwater extraction:

1. characterize GW flowpaths
2. quantify hydroperiod
natural range of variation
3. find balance between extraction and ecosystem requirements

GDE Study Areas

