

## 6. Moderate (temperate) climate

### Distribution

40°-45° to 60°-65° of latitude on both hemispheres, USA + Canada, SE Brazil + Uruguay, majority of European countries, Russia + CIS, New Zealand

### Climate

4 well-known seasons, influence of *continentality* => steppes (prairies), deciduous and boreal (coniferous) forest, wide variations of climate (e.g. NE USA and SW Ireland)

- *Temperature:*
  - in *temperate grasslands* hot summers (30°C), 6 months below freezing
  - in *temperate deciduous woodland* summers are quite cool (20°C), 2-3 months below freezing, winters are milder in western Europe due to Gulf Stream than in E China and NE USA
  - in *temperate coniferous woodland* max summer at 15°C, 6 months below freezing
- *Precipitation:*
  - 250-750 mm in *temperate grasslands*, winter snow and convectional rain in summer
  - 500-1500 mm in *temperate deciduous woodland* (winter maximum), mostly frontal rainfall
  - <500 mm in *temperate coniferous woodland* (snowfalls)

### Soils

*Temperate grassland: Chernozem (Black earth)* = most fertile soils on Earth, rich in calcium carbonate

*Temperate deciduous woodland: Brown earth* = generally quite fertile, earthworms mixing soil nutrients

*Temperate coniferous woodland: Podzols* = precipitation > evapotranspiration => acidic topsoil, acidic nature of needles => iron and aluminium oxides => impermeable pan, few earthworms

### Hydrology

- *Rivers:* Mississippi (+Missouri), Paraná, Paraguay, Rhine, Danube, Elbe, Wisla, Volga, Dnipro, Ob, Enisey, Lena, Huang He
- *Lakes:* The Great Lakes, Caspian Sea, Aral sea, Lake Balkash, Lake Baycal
- *Ocean currents:* cold Labrador, warm Gulf stream, cold Falkland, Oya Siwo

### Fauna and Flora

*Mixed forest* = deciduous + boreal forest

- *Fauna:*
  - *steppes* = rodent species, pheasant
  - *deciduous forest* = buck and deer, wild boar, fox, woodpecker, hawk, snail
  - *boreal forest* = elk/moose, squirrel, owl, lynx, chamois
- *Flora:*
  - *steppes/prairies* = grass (height depends on received precipitation), xerophytic and pyrophytic plants, low amount of biomass <=> lack of trees
  - *deciduous forest* = trees 45-50 m tall, oak, lime, elm, beech, chestnut, maple, mushroom, herbs

- *boreal forest* = generally coniferous (evergreen) vegetation, pine, spruce, biomass 20 kg/m

### Population and settlements

*Europe* = London, Paris, Moscow, Randstadt agglomeration, Emilia-Romagna (Milano, Verona)

*USA* = large conurbations and megalopolises (Bos-Wash, Chi-Pitts)

*Asia* = Tokkaidó, Ósaka-Nagoya, Beijing, Shanghai, Seoul

### Agriculture and Industry

*Intensive agro* (Netherlands, Denmark, UK, Japan) and *Extensive agro* (CIS, Russia, CEEC), USA = intensive + extensive agro

"*Granaries of the world*" = Ukraine, South Russia, Kazakhstan, corn/soya/wheat belts in the USA and South Canada

*High-technology industries* (car, computers – Silicon valley USA, plastics, micro/nano-technologies – research and development parks)

*Mid-tech industries* (oil refineries, manufacturing + food industry)

*Low-tech* (raw materials exploitation, e.g. crude oil + natural gas, non-ferrous metals, smelting + wood-processing industry)

### Social and environmental problems

*unemployment, regional development/economic differentiation* => core-periphery, air + water + soil pollution, urban overpopulation, immigrant assimilation, gastarbeiters,

### **Keywords:**

temperate grassland, steppe/prairie, temperate deciduous/coniferous forest, chernozem, brown earth, podzol, earthworms, biomass, lime, beech, chestnut, maple, conurbation, megalopolis, agglomeration, granary,