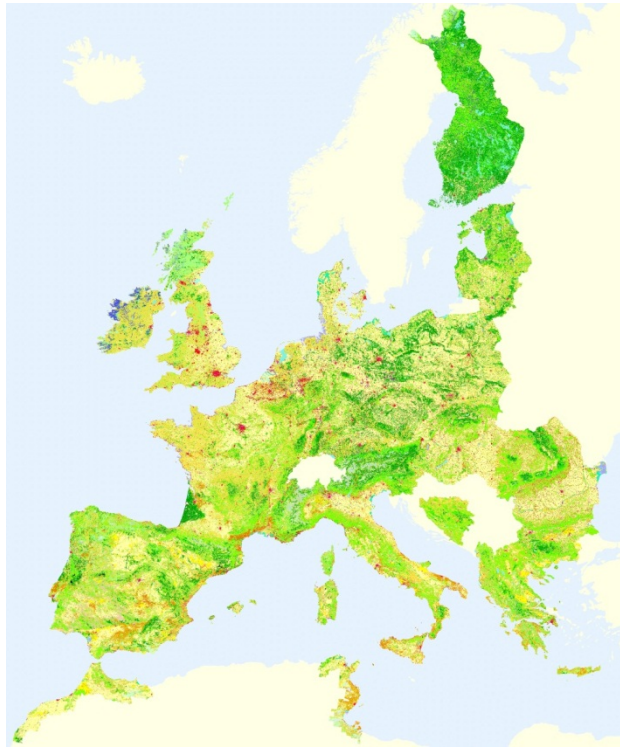


Physiographic Info: Treatment of Land-Use and Urbanization



Outline:

- **Land-cover and land-use:** classification; importance for meteorological modelling and land surface schemes; datasets (CORINE - Coordination of Information on the Environment (Fig. left), ECOCLIMAP, USGS, PELCOM, etc.).
- **Urban lands:** urban lands – some available statistics on development, uptake by origin, by countries, by metropolitan areas.
- **Urbanized areas:** urban boundary layer (UBL); specific features for urban areas; controls on urban climate effects (including Urban Heat Island); approaches for treatment of UBL features; methodologies for urbanization of meteorological models (Increased grid resolution and nesting of models; Urban land-use classification & algorithms for roughness parameters; Urban fluxes and sublayer parameterization; Approach based on improved urban roughness and fluxes; Effect of urban canopy roughness; Effective roughness over inhomogeneous terrain; Surface energy budget in urban areas).

- **Urbanization of models:** urban modules; land surface scheme, tiles and urban areas, modelling domains, and focus; estimation of anthropogenic heat fluxes in urban areas; Building Effect Parameterization (BEP); urban districts classification (extraction of districts related characteristics (statistics); Soil Model for Sub-Meso scales Urbanized version (SM2-U): thermal and water budgets; revised land-use classification.
- **Urban modules results:** as impact of urban areas on simulated meteorological fields through changes in air and surface temperatures, wind characteristics, storage and sensible heat fluxes for different types of urban surfaces (artificial, buildings/roofs, vegetation over artificial surfaces) and urban districts (city center, industrial commercial, high buildings, and residential) on a diurnal cycle and month-to-month variability - for selected case studies and long-term verification.
- **Applicability of results:** Testing and verification of numerical weather prediction and climatological models performance over high resolution model domains, and especially, over the urbanized areas; Investigation of temporal and spatial variability of various meteorological and derived variables over urbanized areas; Improvements in land use classification and climate generation properties; Distinguishing and selection of types of urban districts and their properties; Urbanization of climate regional and global models.
- **Hierarchy of urban parameterizations** - Simple modification of land surface schemes (AHF+R+A); Medium-Range Forecast Urban Scheme (MRF-Urban); Building Effect Parameterization (BEP); Soil Model for Sub-Meso scales Urbanised version (SM2-U); UM Surface Exchange Scheme (MOSES); Urbanized Large-Eddy Simulation Model (PALM) (Fig. right) & examples from research projects.

