











Supervised classification of the Landsat 7 ETM+ images

	Clouds
	Water bodies
	Shallow water
	Mainly non-vegetated areas
	Wet sedge- and moss-dominated tundra
	Moist grass- and moss-dominated tundra
	Moist to dry dwarf shrub-dominated tundra
	Dry moss-, sedge- and dwarf shrub-dominated tundra
	Dry grass-dominated tundra
	Dry tussock tundra

A supervised classification with the *minimum distance algorithm* was carried out.

Nine land cover classes characterised by their vegetation, surface moisture, and topography, plus one class containing clouded areas could be defined by the classification approach for our image dataset:

Water bodies (WB): water bodies include the open water of lakes, rivers, streams and coastal waters.

Shallow water (SW): this class consists of recurrent or steadily shallow inundated areas: a) shallow coastal waters, shallow waters of riverbanks, and mainly barren sand bars, or b) shallow parts of lakes and rivers with typical vegetation of sedges and hydrophilic grasses.

Mainly non-vegetated areas (NV): barren or partially vegetated areas on active river bars, along the coast line, or deflation cliffs. These sites are mostly sandy and vary in soil moisture.

Wet sedge- and moss-dominated tundra (WT): sites with water-saturated substrate and a nearly continuous cover of sedges, especially *Carex aquatilis*, and other hydrophilic graminoids growing in shallow water (e.g. *Eriophorum scheuchzeri*) or mosses.

Moist grass- and moss-dominated tundra (MT): areas are characterised by moist tundra on poorly drained soils and a continuous vegetation cover of grasses, mosses and dwarf shrubs (*Betula nana*, *Salix spp.*).

Dry moss-, sedge- and dwarf shrub-dominated tundra (DMSD): well drained sites with sand as predominant substrate, found often close to cliffs. The vegetation cover can vary: there are sites dominated by sedges, cotton grass and mosses with isolated occurring lichens and dwarf shrubs, other sites are dominated by dwarf shrubs and lichens.

Moist to dry dwarf shrub-dominated tundra (MDD): this class is dominated by dwarf shrubs and is found on moist to dry sites. It occupies large areas of the lower floodplain and is dominated by dwarf willows; on moist sites cotton grass occurs. Seasonal inundations of these areas result in a high content of nutrients in the soils.

Dry grass-dominated tundra (DG): this cover type occurs predominantly on the lower floodplain, the substrates are mostly dry and temporary moist after the inundation. The areas are characterised by grasses (e.g. *Deschampsia brevifolia*), some sites are only sparsely vegetated.

Dry tussock tundra (DT): this land cover class is characteristic for dry, very well-drained sites of upper slopes and pingos. The vegetation cover consists of *Eriophorum vaginatum* tussocks.

Cloud mask: clouds and cloud shadows.