

CEOP HYDROLOGY REFERENCE SITES: Sleeven Polder, lower Feale River basin, County Kerry, Ireland (drainage area ~7.5 km²)



Site summary: The study area includes: the Sleeven Polder (C2M), the polder next to it (Control Polder) and the upland area feeding the two polders. The Sleeven and Control Polders are two of the 15 polders making up the lower Feale River catchment. The lower Feale River catchment is a low-lying flat peaty area of 300 km² situated in County Kerry in southwest Ireland. The Feale River runs through the town of Listowel, meanders along the lower Feale River catchment and flows into the sea at Ballybunnion beach. This river includes the Cashen Estuary, which is over 1 km wide at its widest point. Flooding from the tidal Feale River adjacent to the polders, which are used for agriculture, strongly affects this area. Each polder can be considered as hydraulically independent. The main purpose of the experiment supported by this site is to monitor and evaluate the effectiveness of pumping for eventual implementation in a flood mitigation strategy in the remaining part of the catchment.

The west coast of Ireland, where the study site is located, is influenced by a cool temperate oceanic climate. The Atlantic drift heavily affects the coast. Average annual temperature is about 9 °C. Mean annual wind speed varies between about 4 to 7 m/sec. Rainfall in the area generally averages between 1000 and 1250 mm per year.

The lower Feale River watershed is a low-lying area with poorly defined drainages. Therefore, the strategy for observing the local water balance is to utilize a series of ground and surface water stage recorders, from which surface and subsurface storage changes can be estimated.

Data Summary:

Drainage area to outlet: ~4.5 km² (study polder); 3 km² (control polder)

Basin outlet latitude-longitude: 52°29' (N), 9°40' (W)

Stream gauge/water level recorder period of record: July 2002 to date. The two water level gauges in the river have been collecting data since 1997.

Precipitation gauges 4 Isodaq gages (15 minute recording (July 2002-ongoing). In addition, sporadic data have collected at other locations (not part of the project), but these have many missing values and have not been processed to date.

Water level gages: Nine independent groundwater level gauges (one-hour frequency Orphimedes-OTT) and seven surface water level gauges (three of which are 15-minutes frequency Orphimedes-OTT; the other four record and store at 15 minutes frequency as well, other characteristics not currently known) are operated within the study area (see figure for locations).

Micrometeorological data: downward shortwave and net radiation, screen temperature., and precipitation are measured at a flux tower located at the center of the pump polder (C2M). Micrometeorological parameters are recorded by a data logger every 15 minutes (wind speed and direction, relative humidity, air temperature, surface air pressure). Micrometeorological variables have been recorded from the 7/22/2002 to date.

Turbulent flux measurements: An eddy correlation system (CS7500, CSAT sonic, FW05) consisting of latent, sensible, and CO₂ flux is collocated with the micrometeorological tower. The three turbulent fluxes are sampled at 10Hz frequency; fluxes are calculated and stored on a 15 minutes basis since July 2002. 10Hz data have been archived since August 2003.

Other measurements: Soil temperature, soil heat flux, and soil moisture are observed at the micromet/eddy correlation tower.

References:

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