In this talk we review an ongoing field campaign in the Val Ferret watershed in the Southern Swiss Alps that makes use of arrays of wireless sensor weather networks and fast response sonic anemometers. The patterns of diurnal airflow in the catchment play a dominating role in stream flow generation due to snowmelt and glacier melt runoff response in spring. We present a comparison of watershed simulations and stream flow measurements as well as first observations on the rapid response of airflow due to shadow formation in the morning and afternoon periods. Observations on the consequences for the atmospheric turbulent kinetic energy due to the wind flow patterns are discussed.