



GuMNet - Guadarrama Monitoring Network initiative (Madrid,Spain)

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The Guadarrama Monitoring Network initiative (GuMNet) is an observational infrastructure focused on monitoring the state of the atmosphere, surface and subsurface in the Sierra de Guadarrama, 50 km NW of the city of Madrid. The network is composed of 10 automatic real time weather stations ranging from low altitude (ca. 900 m.a.s.l) to high mountain areas (ca. 2400 m.a.s.l).

The GuMNet infrastructure consists in 10 real time automatic weather stations with instrumentation for observing the state of the atmosphere, surface and the subsurface at the Sierra de Guadarrama, just 50 km north-northwest of the city of Madrid. GuMNet lays the foundations of a research network on weather, soil thermodynamics, boundary layer physics, climate and ecosystem oriented impacts, air pollutions, etc. in the Sierra de Guadarrama. GuMNet represents a first step to provide a unique observational network in an environment of high protection to be used as a laboratory serving a wide range of scientific and educational interests.

High altitude sites are focused on periglacial areas and lower altitude sites have emphasis on pastures. One of the low altitude sites is equipped with a 10 m high anemometric tower with a 3D sonic anemometer at the top jointly with a CO₂/H₂O analyzer that will allow sampling of wind profiles and H₂O and CO₂ eddy covariance fluxes, important for soil respiration and CO₂ and water vapor exchange. A portable station has also a 3D sonic anemometer with CO₂/H₂O analyzer, this 4 meters-high portable tower is designed for comparison with other soil terrain fluxes. The network is connected via general packet radio service (GPRS) to the central lab in the Campus of Excellence of Moncloa and a management software has been developed to handle the operation of the infrastructure. The deployment of instrumentation and connection of sites to the network was finished in 2016. GuMNet is currently in the process of becoming operational.

Conceptually, GuMNet intends to convert a well known space such as the Sierra de Guadarrama into a laboratory for interdisciplinary research. On one hand, a space for exchange of observational and scientific discussion among researchers. On the other hand, online platforms and various informative materials will allow the public to access the results generated by different research lines with a focus on this region. GuMNet is part of the MRI initiative and as well as ongoing collaboration with the Global Precipitation Measurements (NASA).

This initiative is supported and developed by research groups integrating the GuMNet Consortium from the Complutense and Polytechnical Universities of Madrid (UCM and UPM), the Energetic Environmental and Technological Research Centre (CIEMAT), the Spanish meteorological agency, AEMET, the National Park Sierra de Guadarrama (PNSG) and the National Research Council (CSIC).

Web and contact: <http://www.ucm.es/gumnet/>