



## **Systematic recover of long high-resolution rainfall time series recorded by pluviographs during the 20th century.**

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During most of the 20th century, precipitation has been continuously measured by means of the so-called “pluviographs”, i.e. rain gauges including a mechanical apparatus for continuously recording the depth of water from precipitation on specific strip charts, usually on a weekly basis. The signal recorded on such strips was visually examined by trained personnel on a regular basis, in order to extract the daily precipitation totals and the maximum precipitation intensities over short periods (from a few minutes to hours). The rest of the high-resolution information contained in the signal was usually not extracted, except for specific cases.

A systematic recovering of the entire information at high temporal resolution contained in these precipitation signals would provide a fundamental database to improve the characterization of historical rainfall climatology during the previous century. The Department of Land Engineering of the University of Cagliari has recently developed and tested an automatic software, based on image analysis techniques, which is able to acquire the scanned images of the pluviograph strip charts, to automatically digitise the signal and to produce a digital database of continuous precipitation records at the highest possible temporal resolution, i.e. 5 to 10 minutes.

Along with that, a significant amount of daily precipitation totals from the late 19th and the 20th century, either elaborated from pluviograph strip charts or simply derived from bucket rain gauges, still exists in paper form, but it has never been digitalized.

Within a project partly-funded by the Operational Programme of the European Union “Italia-Francia Marittimo”, the Regional Environmental Protection Agency of Sardinia and the University of Cagliari will recover both the high-resolution rainfall signals and the older time series of daily totals recorded by a large number of pluviographs belonging to the historical monitoring networks of the island of Sardinia.

Such data will then be used to construct the high-resolution climatology of precipitation over Sardinia, both assuming stationary climate and slowly varying climate. Specific attention will be devoted to a set of critical hydrological basins, often affected by intense precipitation and flash floods. All information will then be made available to researchers, regional officers, technicians (e.g. hydraulic engineers) and the greater public interested into such information.

The present poster describes the general scope of the E.U. project and the specific activities in the field of climatology of Sardinia rainfall that will be conducted as well as the expected results. A section will be dedicated to show how the pluviograph strips are automatically digitized.