Real-time information on the development of drought conditions is one of fundamental requisites for reinforcing drought mitigation and preparedness. EuroGEOSS interoperability approach promotes the development of monitoring and early warning systems based on real-time information. There is, however, a lack of a common net of meteorological observatories to have access to the information on real-time. This makes necessary to use the open available information to develop the real-time drought information. Commonly, the available information has much lower spatial resolution than the really available datasets. The capability of these low-resolution climatic datasets to quantify drought severity and drought impacts has been analyzed in the framework of the EuroGEOSS project. For this purpose, Standardized Precipitation Index (SPI), obtained from low-resolution precipitation datasets, has been compared to national high-resolution datasets in two European regions: the Ebro basin (Spain) and Slovenia. Different statistics were used to determine the relationships and areas of low spatial agreement between different datasets as well as possible differences in drought changes as a function of drought dataset. Furthermore, the capabilities of different drought datasets to identify drought impacts in different drought prone systems were analyzed. Even though low-resolution datasets failed to detect the real spatial patterns of specific drought episodes, they reproduced quite well the general drought temporal variability, especially at short time scales. Low-resolution datasets also provided reliable outputs in terms of knowing a variety of multi-source impacts.