Climate predictability is highly dependent on spatial and temporal scales due to mechanisms through which local factors respond to large scale processes. Generally, climate predictability rises from both internal modes and forced variability such as anthropogenic climate change and natural external forcings (e.g., major volcanic eruptions, solar activity). Our study investigates predictability sources for climate of South-Eastern Europe originating from both internal and forced variability. The analyzed sources of predictability span multiple spatial scales from global (climate change related trends) and hemispheric (Arctic Oscillation) to regional ones (regional sea surface temperature patterns over Mediterranean and Black Seas). Also, temporal domains of predictive skill ability are identified for these predictability sources in order to contribute to methodology development of seasonal to interannual and decadal climate prediction for the South-Eastern European regions. Data used are station observations from national meteorological networks extracted from European Climate Assessment Dataset (ECAD), reanalysis fields (ERA - 40) and model results from CMIP3 archive. Trend analyses, linear predictive models based on Canonical Correlation Analysis and nonlinear analog approach have all been used to identify particular predictability sources and to assign them a predictive skill. Statistically significant predictive skill has been found on seasonal, multiannual and decadal time scales over South Eastern European regions.