Earthquake forecasting plays a fundamental role in seismology. It demarcates the interface with society, being the basic scientific component of any sound seismic risk mitigation action. At the same time, earthquake forecasting is the ultimate scientific challenge for seismologists, because it describes what we really know about the physics of earthquake occurrence process. In this talk I describe what we know about the science behind earthquake forecasting, and, more in general, about earthquake predictability at different time scales. Moreover, I illustrate the main non-scientific challenges that are related to the use of this kind of information, and to the communication to the public.