



The Association of Geological Surveys of the European Union  
(EuroGeoSurveys)  
in their position as  
custodians to their national natural resources  
and  
guardians of their terrestrial environment  
present their contribution

**The role of natural climate variability in predicting future climate**

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Many predictions have been made for future climatic developments. Most of these predictions however ignore the fact that the world's climate is also in constant natural change. These natural climatic changes must be included in any predictions of future climatic conditions in order for these predictions to be accurate.

### *The issue*

The climate issue today revolves around the extent to which man-made (anthropogenic) emissions lead to an increase in greenhouse gases in the atmosphere, with the consequence that the temperature of the earth's atmosphere will increase above today's level. Any future climatic changes will be of great importance for mankind. Rising sea levels, increasing storm activity in some areas, increasing precipitation and droughts in other areas are predicted in the near future. If these predictions prove to be correct, we will be presented with new limiting factors for life on earth.

### **Climatic change is the rule**

The earth's climate can appear stable when seen from a human perspective. This is however not the case. From investigations of past climates it can be shown that climate variability has taken place on different time scales and at different amplitudes. Changes between cold glacials and more mild interglacials are well known, but also within our, relatively speaking, stable interglacial, the Holocene, natural climate variability has played a significant role shaping and altering the living conditions of our ancestors. The average temperature of the earth's atmosphere has increased by 0.5 - 1.0°C during the last hundred years. This period roughly corresponds to the period during which anthropogenic emissions have contributed to increased concentrations of greenhouse gases and as a consequence may have resulted in an increase in temperature of the earth's atmosphere. The observed increase in temperature is well within known natural temperature variations. This not only leads to problems in estimating the magnitude of the anthropogenic contribution but also underlines the importance of understanding natural climatic variations.

### **The challenges**

From a scientific point of view the challenge is to make the best possible predictions of future climate. As important is it to make these predictions available to decision makers so climate policies are based on the best available climate scenarios. The decision maker will not be interested in past climate changes as such. Only to the extent that this knowledge can contribute to better predictions of future climate is it relevant in this context.

### **The role of European geological surveys**

On a European level, EuroGeoSurveys is the only multinational organization with the potential of providing decision makers with the best updates of natural climate variability and its importance in prognosis of future climatic change. To serve the society with this kind of information EuroGeoSurveys has formed a Policy Sector on Climate Change.

### **Figure caption**

Ideal representation of climate change through time showing natural climate variability, anthropogenic fraction of climate, and the sum (real) climate.