Report on the climate changes

If there is a reduction in the scientific research in uncertainty then it will stimulate the scientists to perform the new scientific research. As it is difficult to define uncertainty and it is also not easy to calculate the quantification of uncertainty. But there are also some projections.

Followings are the summarized projections about the climate change by the IPCC-ARA for the year 2100:

- It is projected that there will be an increase in global mean average temperature on the earth surface is between 1.1 and 29 degrees, according to the lowest projection in greenhouse gas emission in 2100 and there will be an increase in global sea level between 0.18-o.38m.
- But according to the highest emission scenario it is projected that due to greenhouse gas emissions, the increase in temperature of the globe will between 2.4-6.4 degrees and the increase in mean sea level globally will between 0,26 and 0.59m.

Both of the above projections based on the increase in temperature and due to the lower and higher scenario of greenhouse gas emission and sea level increase is due to the melting of ice sheets in northern areas.

Firstly, the uncertainty in an increase in temperature and sea level rise can be quantified by two model projections by observing the situation. Second, the greenhouse gas emission range shows our knowledge about the emission of greenhouse gases due to human activities. The dependence of greenhouse gas emissions is on a decision that happen outside the physical science realm. Third, due to the rise in sea level, there may be an uncertainty in a projection that there are the processes that are happening poorly in the climate models are important and represented poorly or not represented.

Finally, Farber's argument discussed above represents a fourth evaluation of uncertainty, when he concludes that the IPCC process increases the certainty of climate projections because its completeness and openness reduces the possibility of fundamental flaws in the conclusions of global warming. This type of judgment by people outside the community of climate scientists is an important indicator of the robustness of knowledge. It addresses, with a documented method of evaluation, whether nonscientists who are users of the knowledge generated by the scientific investigation of the Earth's climate find the information convincing. These distinct nuances of uncertainty just begin to span the spectrum of uncertainty that both scientists and decision-makers must face. This wider spectrum would include, for instance, the uneven and inconsistent expression of uncertainty by scientists.

Sources of uncertainty in CMIP5 projections:

The recent discussion on the source of uncertainty in climate projection by IPCC AR5 (Fig. 11.8, section 11.3.1.1). In which updates earlier analyses using CMIP3 (temperature, precipitation) to the latest CMIP5 simulations. The main source of uncertainty depends on time, variable and spatial scale.

The three main sources of uncertainty in projections of climate are future emissions (scenario uncertainty, green), internal climate variability (orange), and inter-model differences (blue). Internal variability is roughly constant by time. And the other uncertainties grow with time. But at different rates. Although there is no perfect way to cleanly separate these uncertainties. And different methods have given similar results.

Overall the discussion from CMIP5 is not much changed from CMIP3. For global temperature, the spread between RCP scenarios is the dominant source of uncertainty at the end of the century. But internal variability and inter-model uncertainty are more important for the near-term. For the next decade and internal variability is the main source of uncertainty. A small caveat is the role of anthropogenic aerosols. In which are assumed to decline quite rapidly in all RCPs in the next 20 years. And so this scenario uncertainty may be smaller than it should be.

For global temperature, the figures below show two different representations of this information. Either as a ‘plume’ (Fig. 1) and as a fraction of the total variance (Fig. 2).

The picture can be very different for other variables and on regional spatial scales. For example, for European winter temperatures, the more important variability component is an internal component (Fig. 2). And, for European winter precipitation, scenario uncertainty is almost irrelevant. Because the internal variability and inter-model differences are relatively much larger (Fig. 3). In fact, for precipitation in all regions, of the RCP scenario uncertainty is relatively small. When they compared to the other sources of uncertainty.

The key messages are that resolving inter-model differences could reduce uncertainty significantly. But there is still a large irreducible uncertainty due to climate variability in the near-term. And, particularly for temperature, future emissions scenarios in the long-term.

Uncertainties in Projecting Climate Change Impacts in Marine Ecosystem:

Climate change has major impacts on the marine ecosystem, accounting variations in biogeochemical cycles, trophic levels species life history, and their distribution. These changes in return impact the factors on which society relies factors from they are provoked either negatively or positively on their food webs and ecosystem. For instance, it is assured that the roles of the ocean in generating food for humans and skin for carbon dioxide are changed because of climate change and these changes have a great impact on the results of socio-economics.

Mostly in an ecosystem the variations that matter are mainly biological components and the way they respond as a result of variations in an environment that is the result of climate changes. As if how fishery yield will be affected if any change in temperature or pH occurs. In order to resolve this issue, it is important to combine oceanic components with models of special ecology, population dynamics including their all food webs. As consequences, the uncertainty obtained in physical climate models is taken to ecological models.