Changing Climate, Changing Earth, and Changing Society

Climate is a fundamental component of the Earth’s natural system. Under a relatively stable climate, civilizations have developed and mankind has enjoyed prosperity for several millennia. In response to global warming caused by anthropogenic emission of CO₂ and other greenhouse gases, the climate system is now changing.

Effects of global warming are already visible. The global mean temperature has increased by 0.6 degrees Celsius over the last century, and many organisms and ecosystems have experienced changes. There is a perception that extreme natural disasters, such as floods, droughts, and heat waves, have become more frequent. This change in climate plays an important role in the Earth’s sustainability.

How will climate change proceed in the future? How significant will the effects be to humanity? If humanity changes, what will be the relationship between human activities and climate? Do we have effective measures to prevent or to adapt to climate change?

To answer these questions, we need a comprehensive set of scientific knowledge collected through the collaborative research pursued in an inter-disciplinary manner. Japan’s Global Warming Research Initiative is one answer to this challenging task.