# MODULE 10: HOW IS CHINA'S PRECIPITATION CHANGING PAST, PRESENT AND PREDICTIONS FOR THE FUTURE?

## ANSWER SHEET: CHINA

Complex topography in this part of the world means that local variations in response to global warming, particularly precipitation, are likely to be large and many areas may vary from the regional trend (Christensen *et al*., 2007).

• A lack of consistency between models in representing monsoon processes contributes to uncertainty in estimates of future precipitation in this region (Christensen *et al*., 2007).

• China's coastal regions may be vulnerable to sea level rise. Sea level in this region is projected by climate models to rise by the following levels by the 2090s, relative to 1980 - 1999 sea level:

- 0.18 to 0.43m under SRES B1
- 0.21 to 0.53m under SRES A1B
- 0.23 to 0.56m under SRES A2

For further information on Climate Change projections for Asia, see Christensen *et al.* (2007) IPCC Working Group I Report: '*The Physical Science Basis'*, Chapter 11 *(Regional Climate projections*): Section 11.4 *(Asia*).

### ACTIVITY ONE

- Average rainfall has not consistently increased or decreased since 1960.

Students could be told about the significant trends evident in particular regions.

- In north west China (Region A) significant positive trends are observed in dry season rainfall of 0.5mm per month (+9.2%) per decade.
- In south east China (Region E) significant increasing trend of 5.6mm per month (3.3%) per decade is observed in JJA rainfall.
- The proportion of rainfall that occurs in heavy events has not changed significantly since 1960. A 'heavy' event is defined as a daily rainfall total which exceeds the threshold that is exceeded on 5% of rainy days in current the climate of that region and season.

### ACTIVITY TWO

Projections of mean annual rainfall from different models in the ensemble are consistent in indicating overall increases in rainfall for China. Projections vary between 0 and +16mm per month (0 to +23%) by the 2090s.

- These increases are largest, in absolute terms, in the wet season, JJA, but proportionally are similar throughout the year.
- North east China (Region A) is projected to receive increased rainfall throughout the dry seasons, but these increases are partially offset by decreases in wet season (JJA) rainfall.
- North west and North central China (Regions B and F) are projected to receive increases in rainfall all year round.
- Rainfall projections for the Tibetan Plateau region (Region C) are mixed, with some large increases in wet season rainfall over the southern most stretches near Nepal and Bhutan, but decreases in DJF.
- The southern regions of China (Regions D and E) are projected to experience increases in wet - season rainfall, and decreases in dry - season rainfall