

### **Question on notice no. 1181**

**Senator Richard Di Natale:** asked the Minister for the Environment and Water on 5 February 2020—

With reference to the Bureau of Meteorology:

1. Given the 1 degree rise in global temperatures, what has been the average increase in land temperatures in Australia.
2. Given that the United Nations Environment Program notes the current Nationally Determined Contributions has the world on track for 3.2 degrees of warming, what will be the expected average land temperature increase in Australia.
3. What would the implications of 3.2 degrees of global temperature be for the following:
  - a. mean annual rainfall in south-east and south-west Australia;
  - b. mean annual streamflow in south-east and south-west Australia;
  - c. the average number of annual days of severe fire risk (FFDI 50-74) in south-east and south-west Australia;
  - d. the average number of annual days of extreme fire risk (FFDI 75-99) in south-east and south-west Australia;
  - e. the average number of annual days of catastrophic fire risk (FFDI 100+) in south-east and south-west Australia;
  - f. the average number of annual days over 35 degrees in south-east and south-west Australia; and
  - g. the average number of annual days over 40 degrees in south-east and south-west Australia.

**Answer —**

**Senator Birmingham:** The answer to the honourable member's question is as follows:

1. The observed warming over Australia, measured as a linear trend from 1910 to 2019, is approximately 1.4 °C.
2. The United Nations Environment Program estimates for future global warming do not include estimates for future Australian warming. It is therefore necessary to derive estimates for Australia from alternative sources. There is considerable uncertainty in the timing and degree of future changes in both global and Australian temperatures, so they are best expressed as temperature ranges. Based on historical observations and future projections drawn from the IPCC 5th Assessment Report, global warming of 3.4 degrees C is estimated to translate to warming of between 3.4 and 4.4 degrees C for Australia.
3. Based on projections of between 3 and 4 degrees of global warming, the following conditions are projected:
  - a. Mean annual rainfall in south-east and south-west Australia: 5 to 15% drier than a 1981-2010 baseline.

- b. Mean annual streamflow in south-east and south-west Australia: high confidence of decreased runoff, but more hydrological modelling required to assess the magnitude of change.
- c. Fire risk: Current modelling is not sufficiently granular to enable different categories of FFDI to be forecast with reasonable certainty. Similarly, there is low confidence in the magnitude of increases in FFDI out to 2070, although an increase in the number of days FFDI 50+ is expected.
- d. As outlined in 3c, FFDI projections have not been produced for the 75-99 FFDI increment.
- e. As outlined in 3c, FFDI projections have not been produced for the 100+ FFDI increment.
- f. Regional modelling is required to provide more precision on the future changes for southeast and southwest Australia.
- g. Regional modelling is required to provide more precision on the future changes for southeast and southwest Australia.