Fig. 1. Global mean surface temperature
Fig. 2. Estimates of surface temperatures based on Paris Agreement pledges and current policy settings.

Climate Action Tracker http://climateactiontracker.org
Fig. 3. Global mean sea-level measured by tide gauges (purple) and satellites (blue, red, green) overlain on paleoclimate data (error bars), and projections to 2100 based on low (blue) and high (red) IPCC emissions pathways (RCPs, representative concentration pathways)³
Fig. 4. Left – Map of Antarctica showing extent of East Antarctic Ice Sheet (EAIS, 54m SLR) and West Antarctic Ice Sheet (WAIS, 4m SLR). Right – Map of Antarctic bedrock topography with ice removed. Blue regions below EAIS and WAIS indicate subglacial basins where ice is grounded below sea-level.
Fig. 5. Antarctic (a) and Greenland (b) ice loss between 2003-2012. Lower graph shows mean annual Antarctic ice mass loss.
Southern Ocean is warming

Ice shelves are melting

Paolo et al. (2015), Science

Pritchard et al. (2013), Nature

Fig. 6. Relationship between ocean warming and thinning of Antarctica’s marine ice sheet margins.
<table>
<thead>
<tr>
<th>Age</th>
<th>CO₂</th>
<th>Terrestrial ice sheet threshold (750ppm)</th>
<th>Marine ice sheet threshold (450ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 – 34 Ma</td>
<td>&gt;800ppm</td>
<td></td>
<td>+22m SLR</td>
</tr>
<tr>
<td>34 - 14 Ma</td>
<td>650-450ppm</td>
<td></td>
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</tr>
<tr>
<td>14 – 2.5Ma</td>
<td>450-300ppm</td>
<td></td>
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<tr>
<td>2.5 Ma – c. 1900 AD</td>
<td>300-200ppm</td>
<td></td>
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<tr>
<td>1900 – 2300 AD</td>
<td>300 to 2000 ppm</td>
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</tbody>
</table>

Ice Sheet stability thresholds from geological data and modelling
- 750ppm – threshold for deglaciation of Antarctica (EAIS)
- 600ppm – threshold for continental-scale glaciation (EAIS)
- 450ppm – threshold for loss of all Antarctic marine based ice sheets (EAIS/WAIS)

Ice sheet and sea-level sensitivity from geological data and modelling
- >750-1000ppm, 8-12°C, +65m GMSL – ice free world
- >450pm-750ppm, 4-8°C, +20 - +65m GMSL – variable terrestrial EAIS
- ~450ppm, +2-3°C, +20m GMSL – variable marine EAIS, WAIS

Fig. 7. Relationship between atmospheric CO₂, global average temperature and Antarctic ice sheet dynamics from geological data and reconstructions spanning the last 55 million years. IPCC³ temperature projections for the range of emission scenarios are shown for context.

Marine-based EAIS/WAIS
Fig. 8. Global temperature anomaly map showing warming pattern above pre-industrial, and strong polar temperature amplification, 3 million years ago the last time atmospheric CO$_2$ levels were at ~400ppm. This is based on computer climate model simulations constrained by temperature reconstructions from geological data.
Fig. 9. Model reconstruction of the extent and thickness of the Antarctic ice sheet during the warm climate of the Pliocene 3 million years ago when atmospheric CO₂ was 400ppm and the global average surface temperature had equilibrated to +3°C above the pre-industrial average. The loss of Antarctic ice was equivalent to ~+13m global sea-level rise.
Fig. 10. Left- Compilation of sea-level projections for the year 2100 and for years 2300 and 2500 (right) for each IPCC emissions pathway (RCP, representative concentration pathway). RCP 8.5 represents unconstrained emissions and RCP 2.6 approximates the Paris Agreement target of 2°C.
Revised estimates of global mean sea-level rise by the year 2100 for the IPCC, RCP 8.5 high-emissions pathway, based on new paleo-calibrated ice sheet model simulations compared with the "likely" (66%) range from the IPCC %th Assessment Report. 

Sources listed in Church et al. IPCC (2013)
The geological perspective on long-term sea-level rise

This long-term perspective illustrates that policy decisions made in the next few years to decades will have profound impacts on global climate, ecosystems and human societies — not just for this century, but for the next ten millennia and beyond. ...Clark et al., 2016, Nature Climate Change

For example the equilibrium sea-level response to 3°C global warming may be as much as +20m

Fig. 12. Illustration of the long-term commitment to future sea-level rise for different levels of carbon in the atmosphere (numbers top right in trillions of tonnes of carbon)
Fig. 13. The difference between $<+1.5^\circ$C and $>+2^\circ$C, means the difference between $<1$ m and multi-meter sea-level rise over centuries to come from melting of the Antarctic ice sheet. The avoided impacts of meeting the Paris Climate Agreement target are significant.
Fig. 14. The spatial pattern of sea-level rise from 1m of sea-level equivalent ice volume loss from West Antarctica. Note that the Ross Sea, Pacific Coast of West Antarctica and the Peninsula experience a -250% sea-level change (fall), whereas the North America experiences a +125% sea-level change (rise)\textsuperscript{43}. 