We're in the early stages of climate change — just how much depending in large part on whether we control our emissions. But how quickly will this happen? Is it a bulldozer we can dodge or a bullet train that's too fast to avoid? That makes a lot of difference in terms of our ability to adapt to climate change.

A recent report from the National Research Council points out that we're already seeing fast changes driven by climate in terms of the rapid disappearance of sea ice. This change will have repercussions:

> More open water conditions during summer would have potentially large and irreversible effects on various components of the Arctic ecosystem, including disruptions in the marine food web, shifts in the habitats of some marine mammals, and erosion of vulnerable coastlines. Because the Arctic region interacts with the large-scale circulation systems of the ocean and atmosphere, changes in the extent of sea ice could cause shifts in climate and weather around the northern hemisphere.

The report points out other events that may occur over short time spans, such as destabilization of the West Antarctic Ice Sheet and widespread loss of biodiversity. The report also considers some other possibilities that are less likely to occur abruptly such as slowing of the ocean currents that support the Gulf Stream.

The bottom line is that we need to be prepared for the possibility of abrupt change:

> The abrupt climate changes and abrupt climate impacts discussed here present substantial risks to society and nature. The ability to anticipate what would otherwise be "surprises" in the climate system requires careful monitoring of climate conditions, improved models for projecting changes, and the interpretation and synthesis of scientific data using novel analysis techniques. In light of the importance of actionable information about the occurrence and impacts of abrupt changes, it is the Committee's judgment that action is urgently needed to improve society's ability to anticipate abrupt climate changes and impacts.

The bottom line is that we may be facing a powerful but relatively slow-moving bulldozer — but we should be prepared to jump fast if it turns out to be a

bullet train instead.