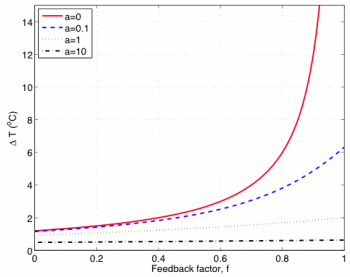

Feedback Effects (the red curve)

From the title, this could be a posting about the election results. It isn't — although I do wonder whether the relatively rapid changes we've seen in the House over the past decade are a sign of increased feedback effects. My topic, however, is climate science.

The curve at the left shows how feedback effects can reinforce changes. RealClimate has another excellent post discussing the operation of feedback effects in the context of climate change. *f* is the feedback factor in this graph. Note that the effect of feedback grows quickly as the *f* approaches 1. As the RealClimate post points out the apparent climb to infinity is really an artifact because of linear approximation of feedback — actually, *f*=1 represents a tipping point into a new state.

Water vapor is the primary feedback effect on our planet. It seems to be a positive feedback — we know that small changes in solar feedback lead to large temperature changes rather than being eliminated through negative feedback– but we don't know with great confidence the magnitude of the feedback effect or how it might change under different circumstances. Much of the uncertainty concerns reflection of sunlight from low-altitude clouds, which could counter warming. Current climate models suggest that the overall water vapor feedback is significant.

The risk, as shown by the graph above, is that it if is positive and large, it could lead to large nonlinear effects, meaning very large warming or a flip to another climatic system. On the whole, the uncertainty is more worrisome than comforting.