

Takehome Messages About Global Energy Models

A scientific model is a mathematical “entity” that behaves like a real-world system.
If a model is good, the results can “predict” what happens in the real world.

The world is a big and complicated place.
Any useful model of the world will inevitably be a big and complicated thing.

(Like, {insert halftime pep-talk phrase here}, folks – this is the real world.)

(Especially in the case of global climate change,)

Simple models are part of the problem,
because busy people, “non-scientists,” and simple minds
can grasp them and use them as the basis for action (or inaction!)

Energy moves from place to place within the global system
in a number of different ways. . . We cannot understand the system
if we leave out any of the major ways in which energy moves.

Human activity can “change the rules” that govern the flow of energy
in many different places within this huge and complicated system.

Changing the flow of energy in any part of the system
will inevitably change the amount of energy in many other parts.
This, in turn, will inevitably change other flows.

“Doing research” on a big and complicated system
almost always involves making very careful measurements
of something that is very small and localized

(and hoping that other people are measuring
other things in other places just as carefully).

Finally

(and most important)

as we get better at making
all of the individual little measurements,
the behavior of the whole system
gets easier to understand.

And with that understanding comes the ability to predict
the results of changes anywhere in the system.