What problem are you trying to solve?*

Cécile Penland
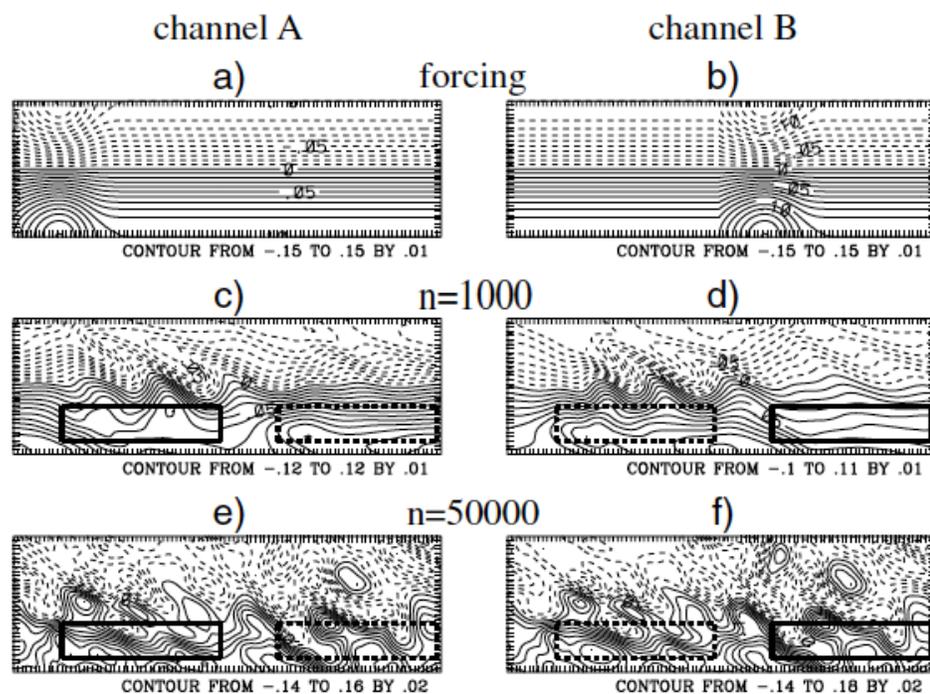
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*This way I can talk about anything.

$$\frac{Dq^A}{Dt} + cJ(\psi^A, q^B - q^A) = F^A + D, \qquad (5a)$$

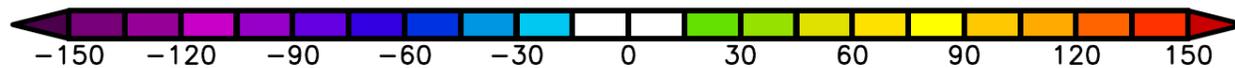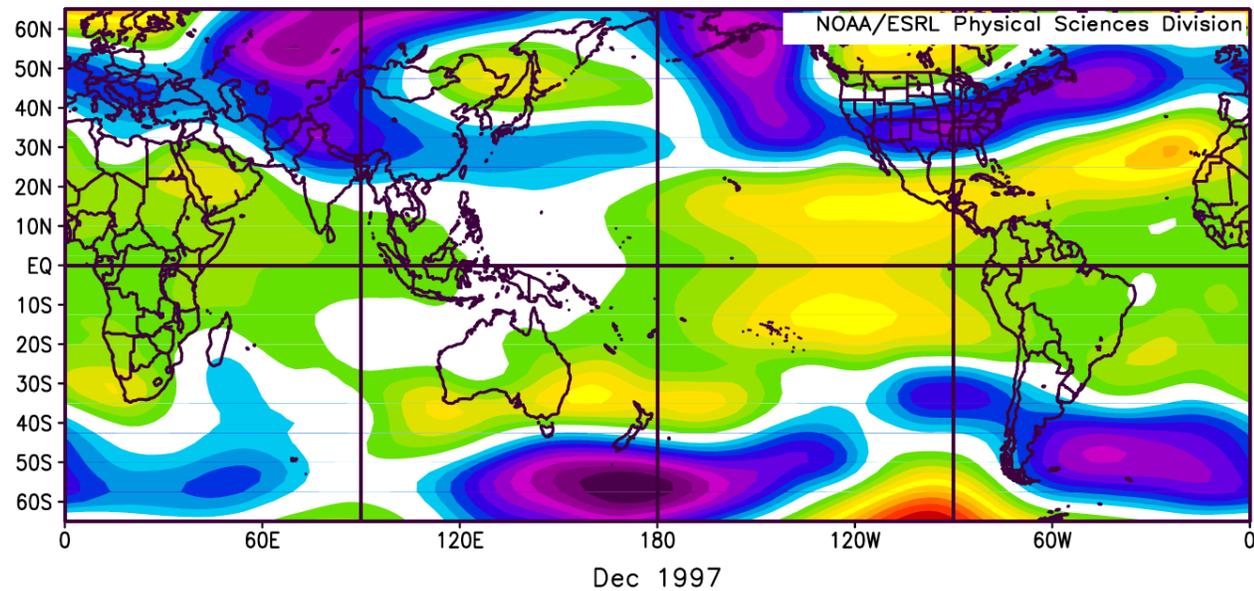$$\frac{Dq^B}{Dt} + cJ(\psi^B, q^A - q^B) = F^B + D, \qquad (5b)$$

channel A   channel B

a)   forcing   b)

CONTOUR FROM −.15 TO .15 BY .01   CONTOUR FROM −.15 TO .15 BY .01

c)   n=1000   d)

CONTOUR FROM −.12 TO .12 BY .01   CONTOUR FROM −.1 TO .11 BY .01

e)   n=50000   f)

CONTOUR FROM −.14 TO .16 BY .02   CONTOUR FROM −.14 TO .18 BY .02

FIG. 2. Stream function describing the forcing and evolution of a coupled parallel channel model as in Fig. 1, but with longitudinally skewed forcing jets $\psi^{A*} \neq \psi^{B*}$ (a),(b) and advective coupling [Eqs. (5) and (6)], with $c = 1/2$. Near-identical synchronization occurs by the last time step shown (e),(f). The solid-line boxes designate the regions in the two channels used to label a given flow as "blocked" or "zonal." Blocking activity in the dashed-line box in channel A, which is nearly the same as in the solid-line box in channel B after synchronization, anticorrelates with blocking in the solid-line box in channel A (similarly for the dashed-line box in channel B).
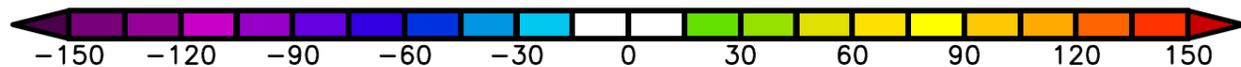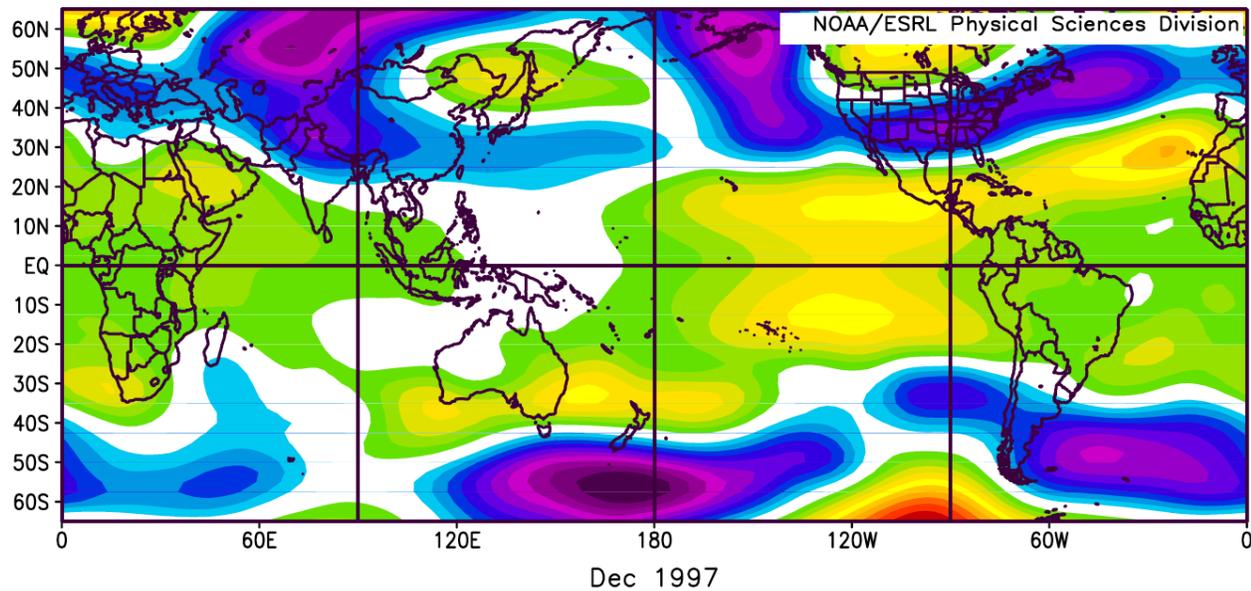
A very nice paper by Duane and Tribbia (2001)

NCEP/NCAR Reanalysis
200mb Geopotential Height (m) Composite Anomaly 1981−2010 climo

NOAA/ESRL Physical Sciences Division

Dec 1997

NCEP/NCAR Reanalysis
200mb Geopotential Height (m) Composite Anomaly 1981-2010 climo

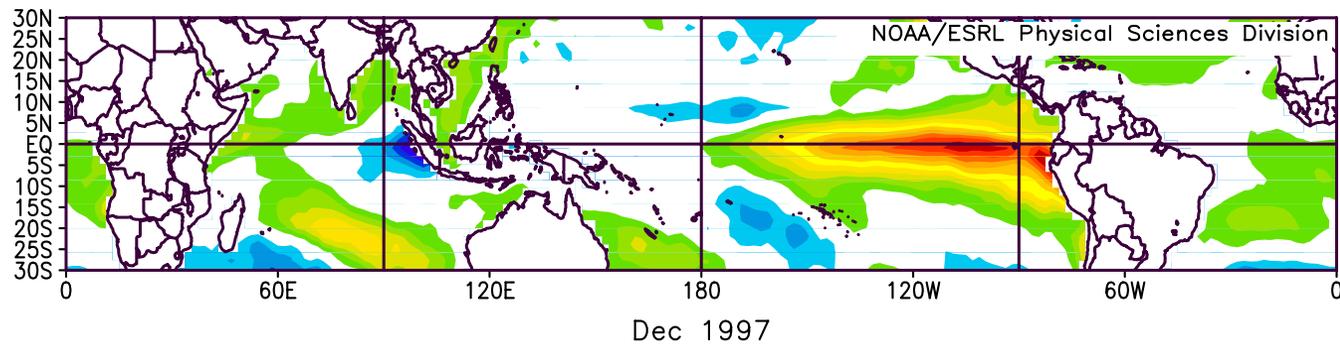NOAA/ESRL Physical Sciences Division

Dec 1997

−150 −120 −90 −60 −30 0 30 60 90 120 150

NCEP/NCAR Reanalysis
Surface Skin Temperature(SST) (K) Composite Anomaly 1981-2010 climo

NOAA/ESRL Physical Sciences Division

Dec 1997

−5 −4 −3 −2 −1 0 1 2 3 4 5
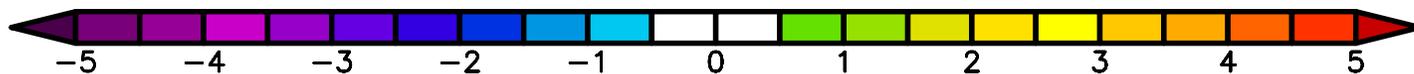
What criteria do we use to invoke a simple model to explain observed phenomena?

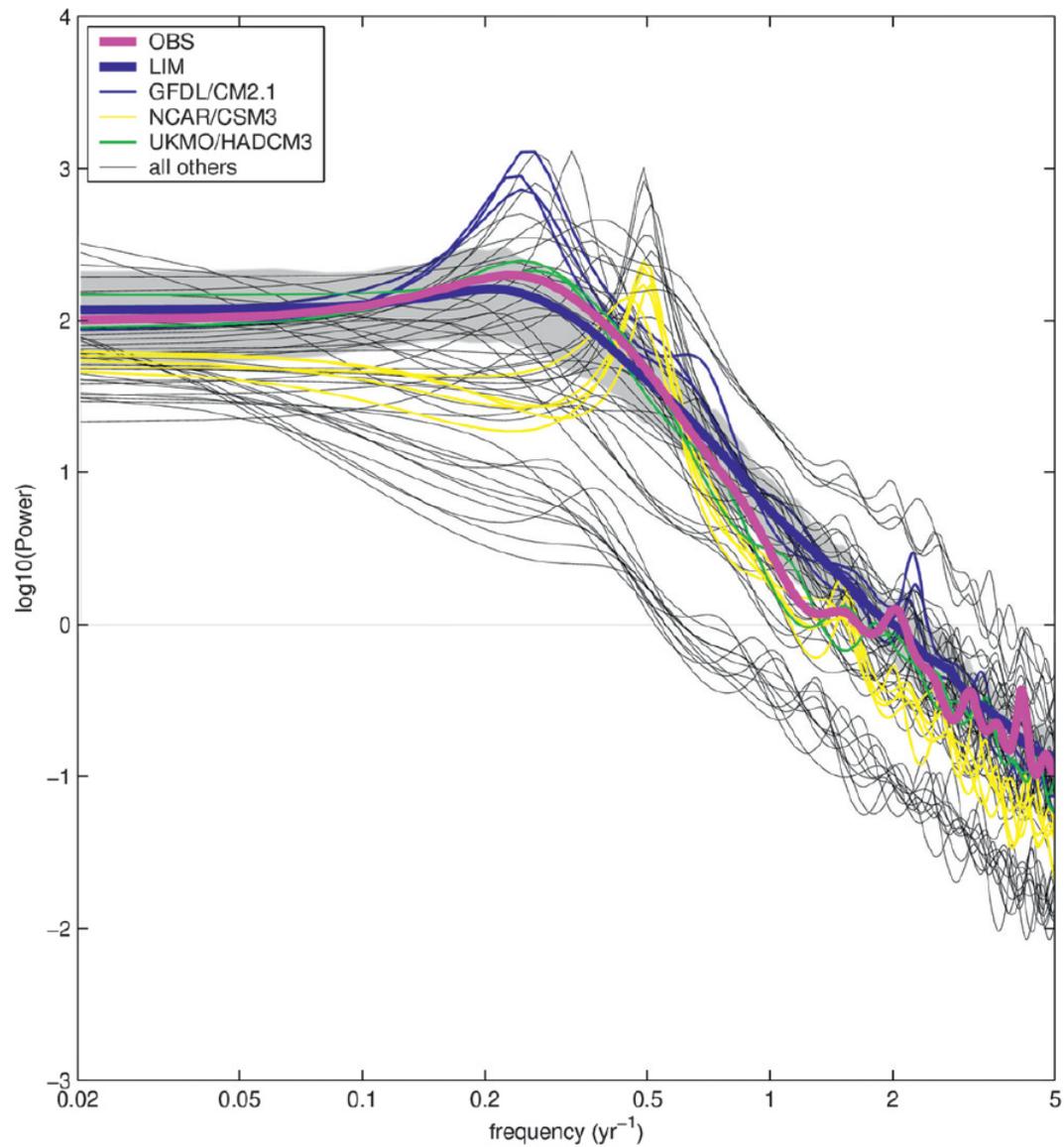# What criteria do we use to invoke a simple model to explain observed phenomena?

Why pick on just simple models?

Disclaimer: Most of these GCMs are obsolete and have much better SST spectra.

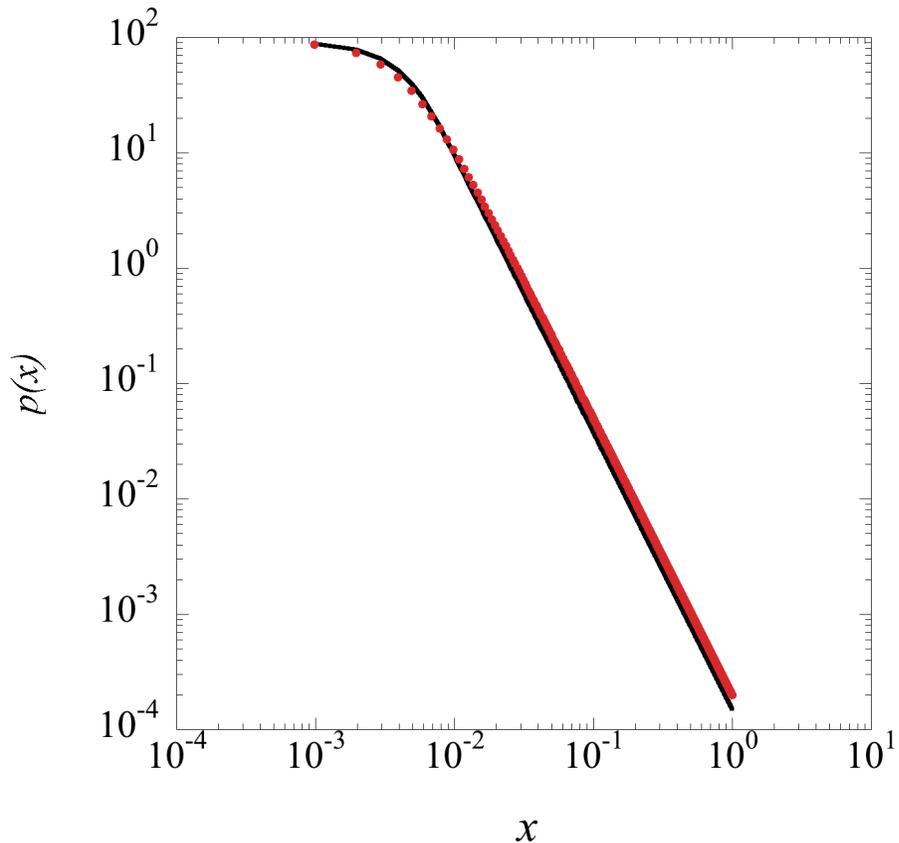What criteria do we use to invoke a ████ model to explain observed phenomena?

What about parameterization?

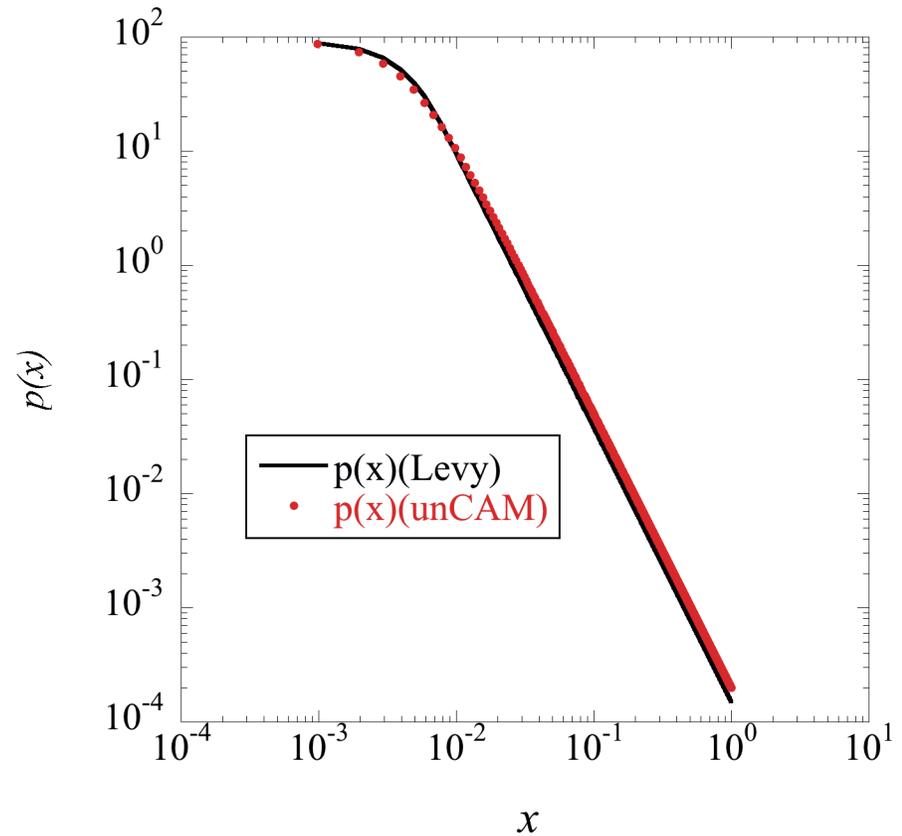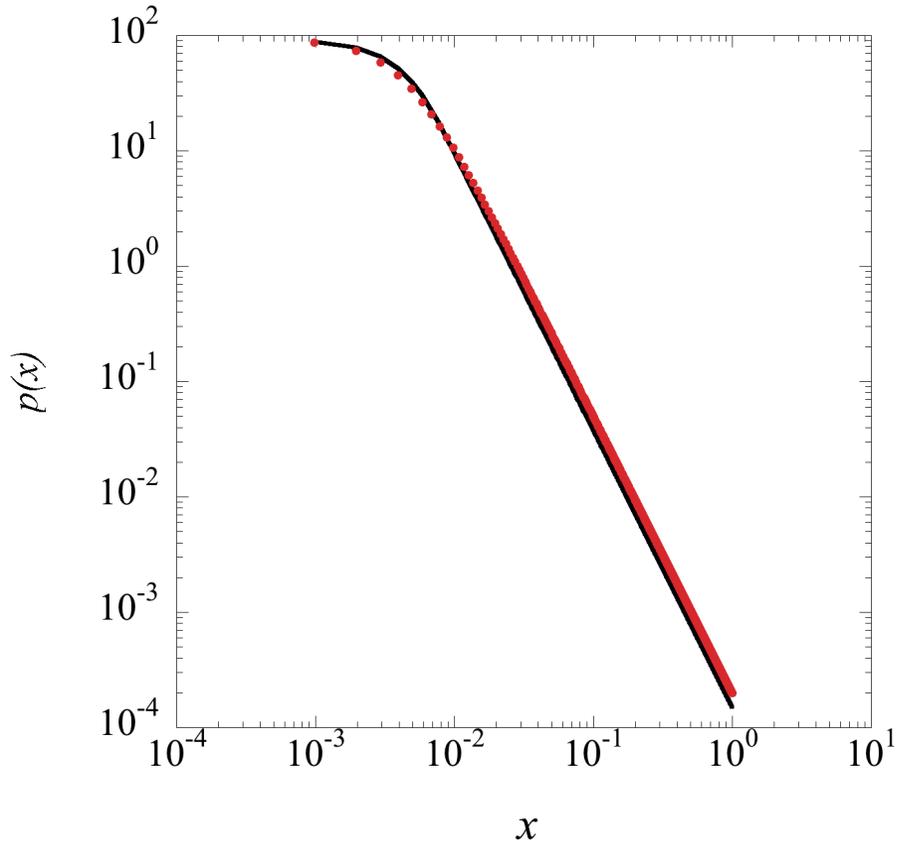# What about parameterization?

Penland and Sardeshmukh (2012)

1) α-stable Lévy process

2) $\dfrac{dx}{dt} = -\gamma x + Ex\xi_1 + b\xi_2 \, (UnCAM)$

What about parameterization?

My opinions:

All sins should be mortal.

Words like "explain" and "same" should be given qualifiers.

Handsome is as useful is.