Some Climate-Change Data Bases Useful for the Asia-Pacific Region

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Describing Global Climate

Considerable Progress

- We Now Have Remarkable Synergistic Tools
  - Satellite imagery, plus operational products.
  - Other satellite observations, plus products.
  - Scientific geographic information systems
  - Information access tools (e.g. the Web).

Introductory Comment: Maps vs Real Data - Both good, but different

- Maps may help us understand certain points, ***but the actual data are needed for more thorough analysis***.
- A Website with maps is helpful. One with both maps and source data may be more helpful.

Let’s See What’s Available

How can we use the data for capacity-building?

Let's Look at 2 Types of Websites:

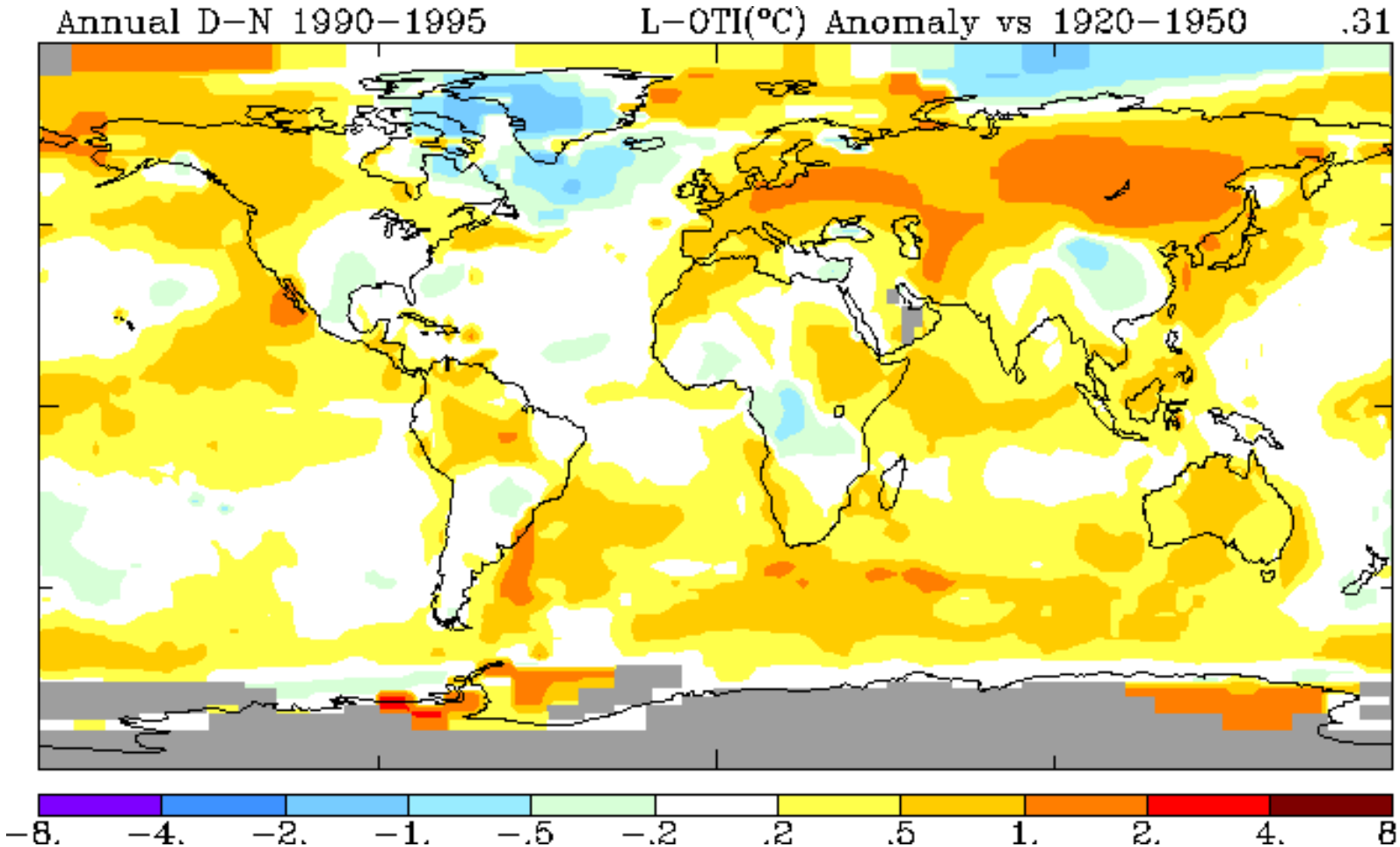
1) Websites that present maps, but don't make data easily accessible. These are intriguing. However, they might be better if they also made their data available.
2) Websites that serve data (and sometimes also maps).

. . . .First, the Websites that present maps, but don't make data easily available.

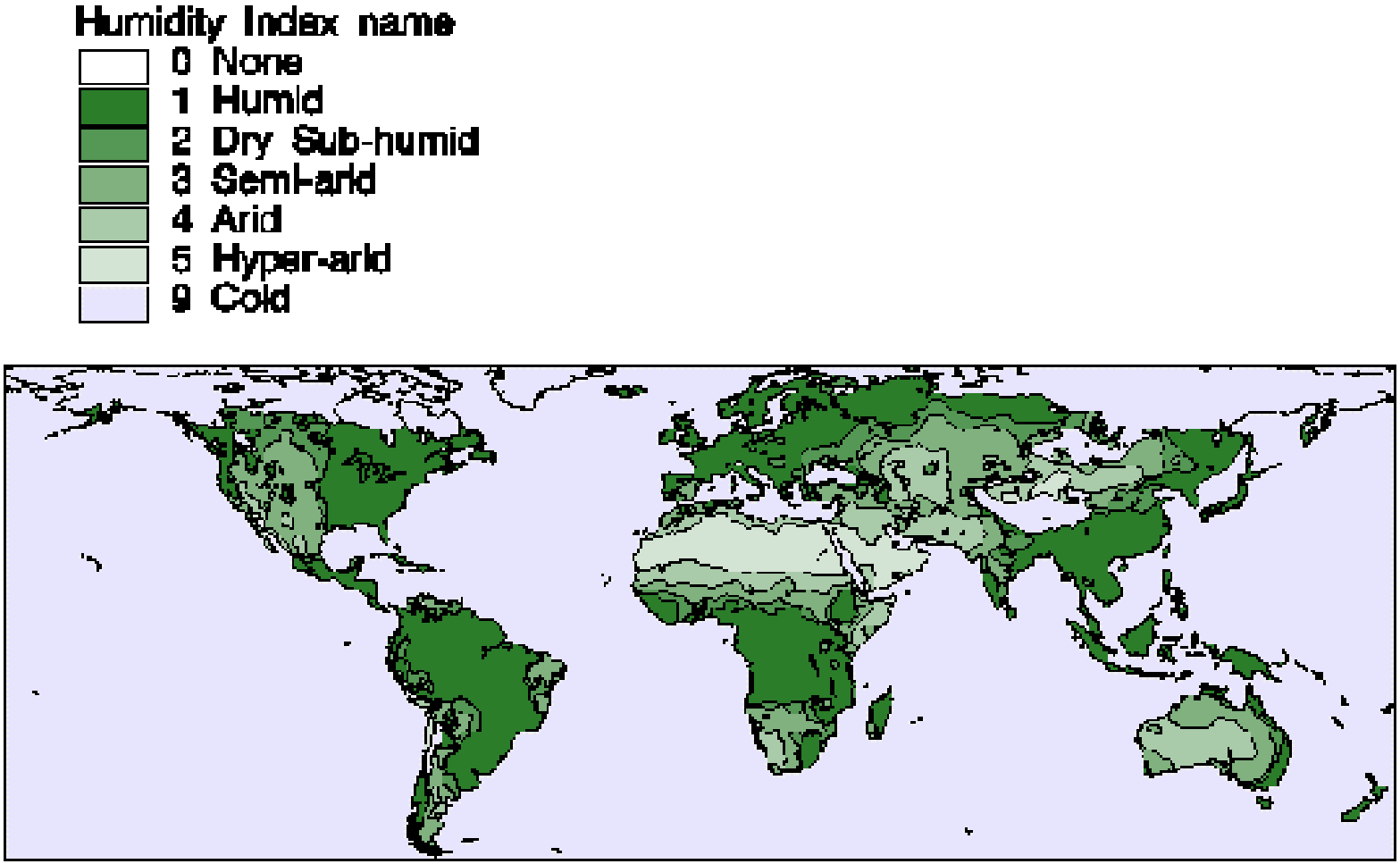
Change in temperature 1990s vs. 1920-50:

http://www.giss.nasa.gov/cgi-bin/update/gistemp/do_nmap.py

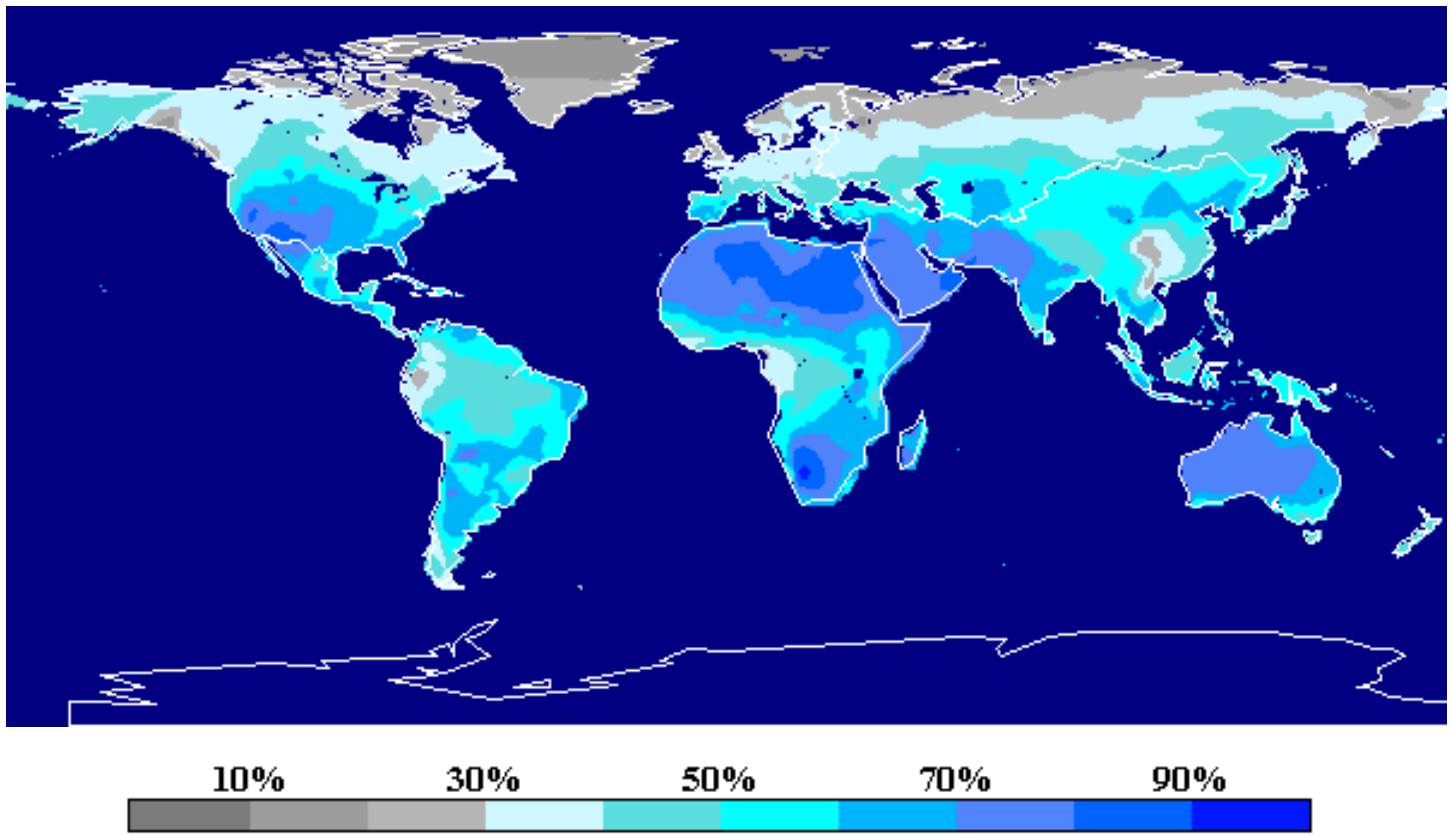
You can choose your time periods on this site and get a customized map.



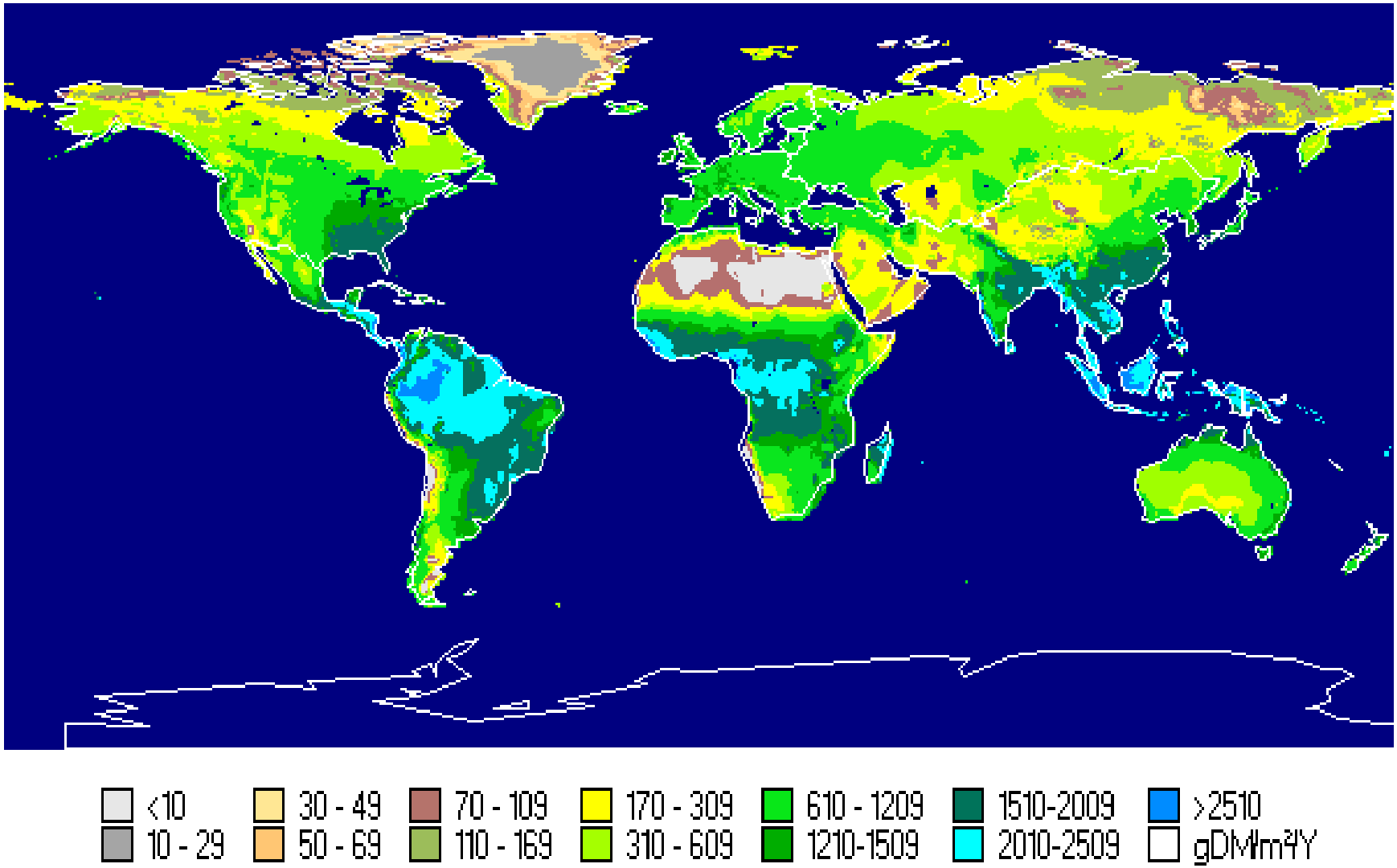
Global Humidity Index (FAO)



Annual Sunshine: Percentage Possible (FAO)



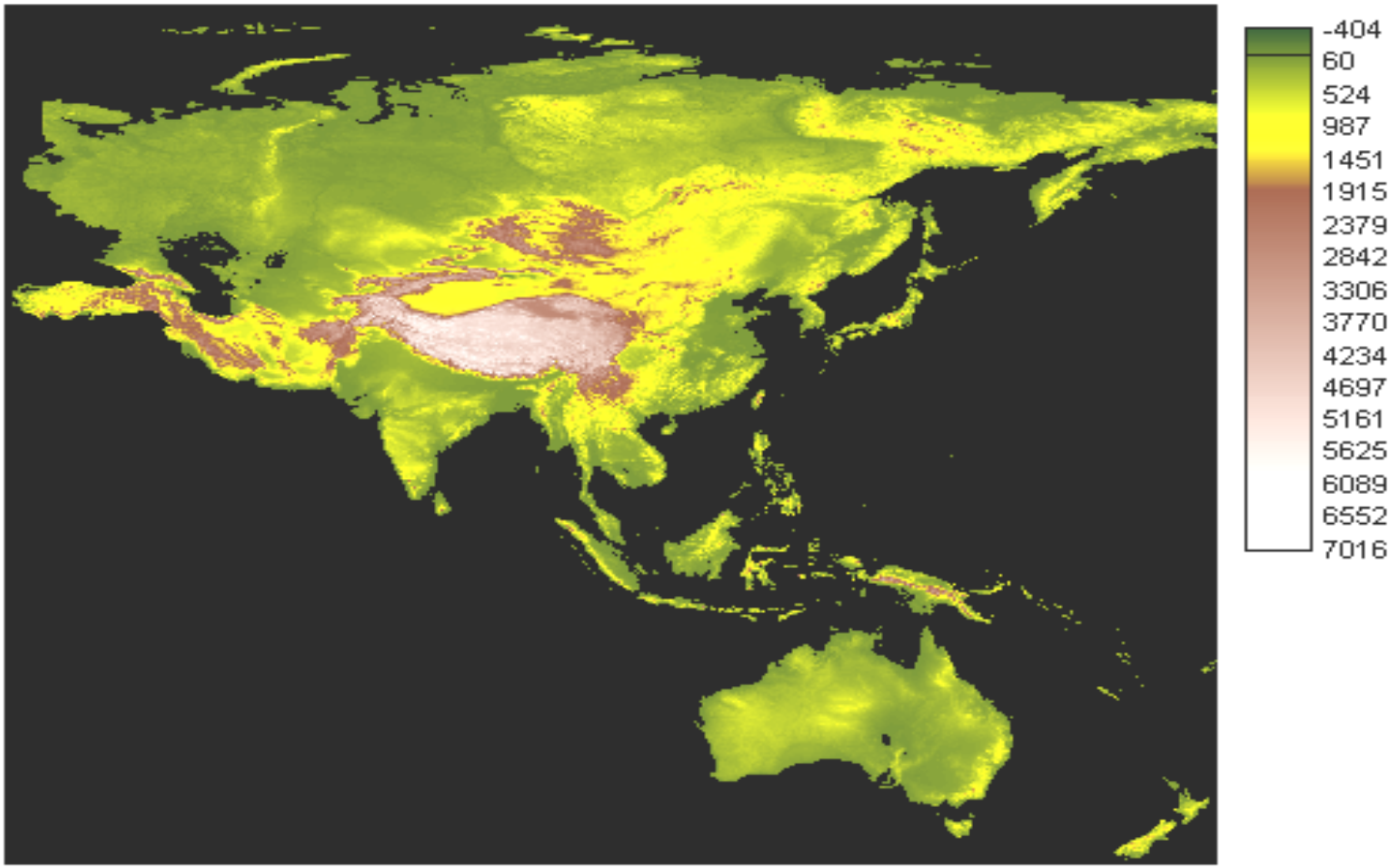
Annual Biomass Potential (FAO)



...Now let's see Graphics Depicting Real Data

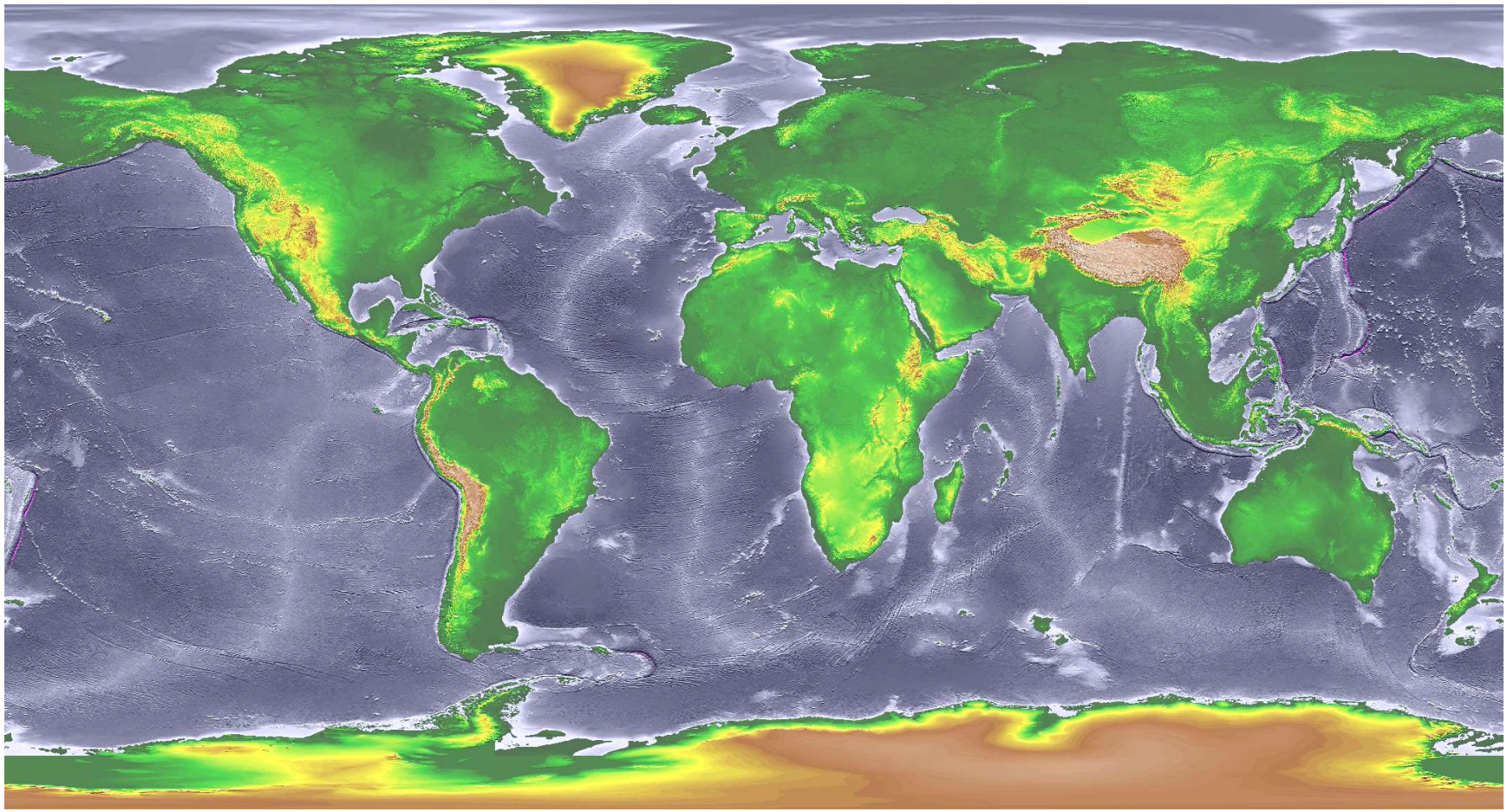
- These data are available. Sometimes there are various flavours of "the same" data available.
- Often data and documentation are not perfect. (I recently learned from one source in NASA that FAO is part of UNESCO..)

Model: Elevation (CEOS GLOBE)

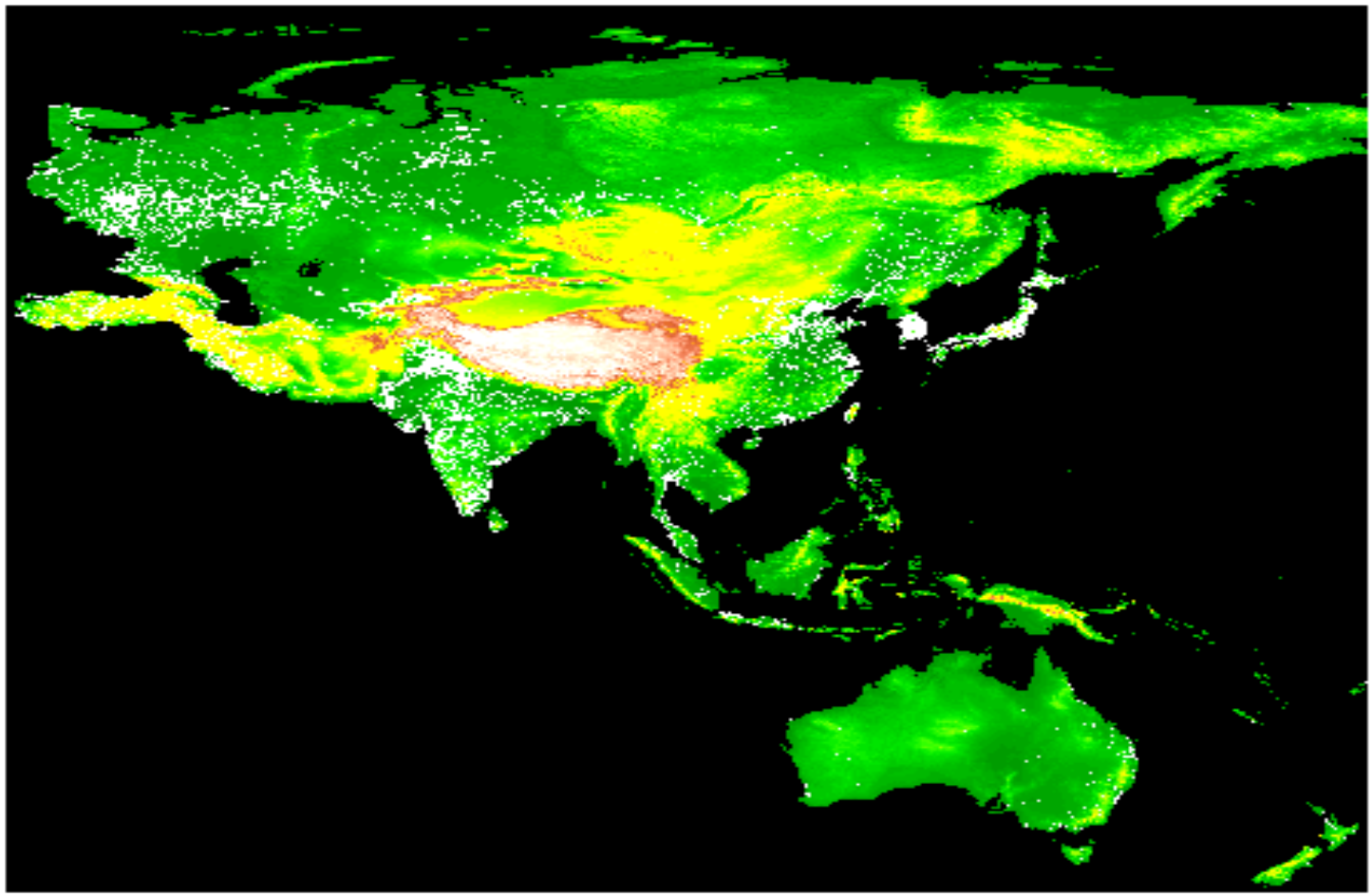


Not precise enough to model possible inundated areas if the sea level rises 1 metre, but useful for other applications, such as: (see next slides)

Sea Level During the Last Ice Age
(~110m below present sea level)



Model: Nighttime Lights & GLOBE Elevation



Where do the people live?

El Nino / La Nina (1)

- El Niño events occur irregularly, about every 2 – 7 years. They last from 12 to 18 months.
- El Nino and La Nina are becoming more reliably predictable with modern data and methods.
- Beyond this, we are improving our response, such as our ability to advise farmers, in advance, of appropriate crops and methods.

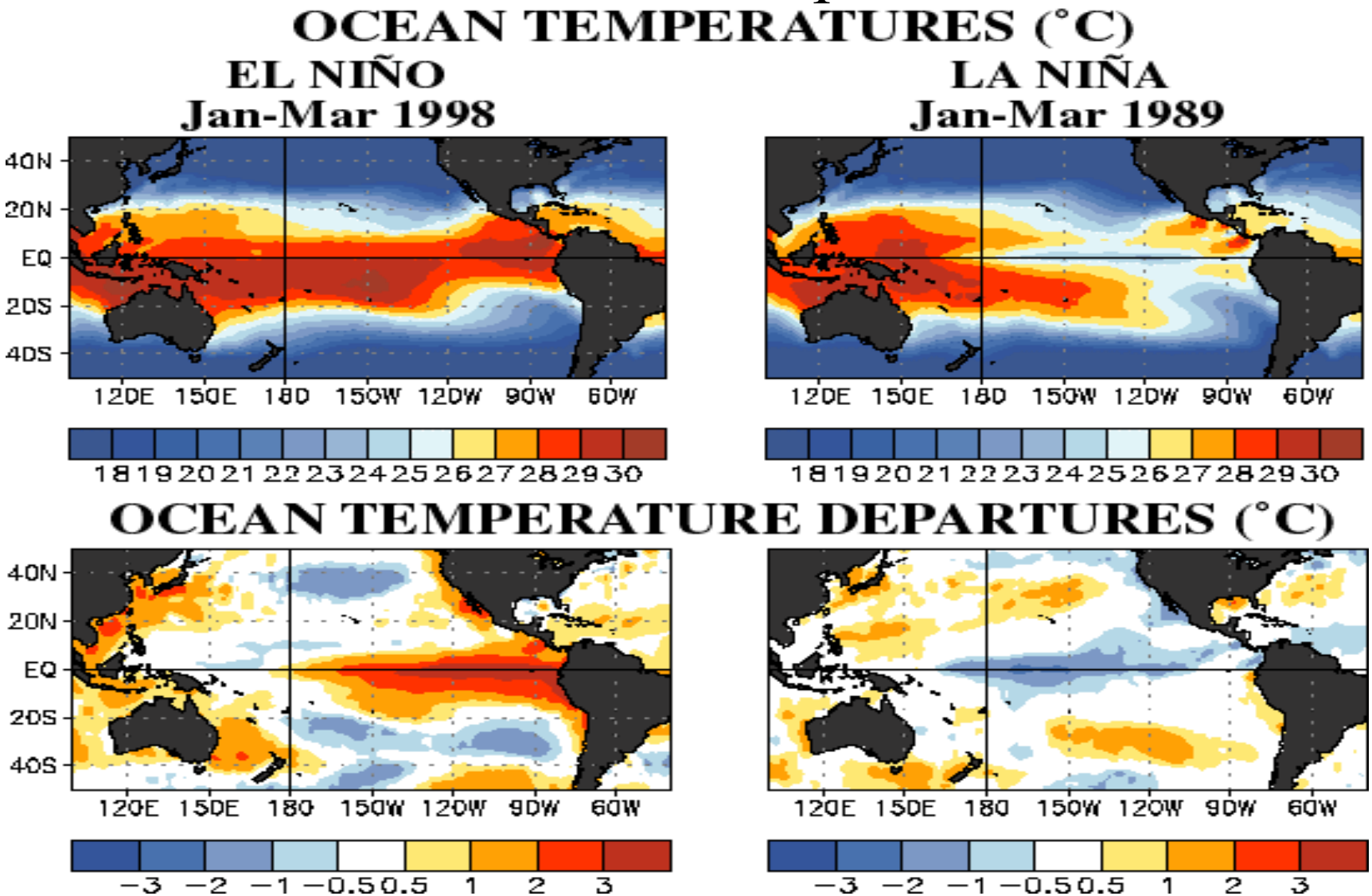
El Nino / La Nina (2)

There is an increasing association of environmental/health phenomena with El Nino/ La Nina. For example:

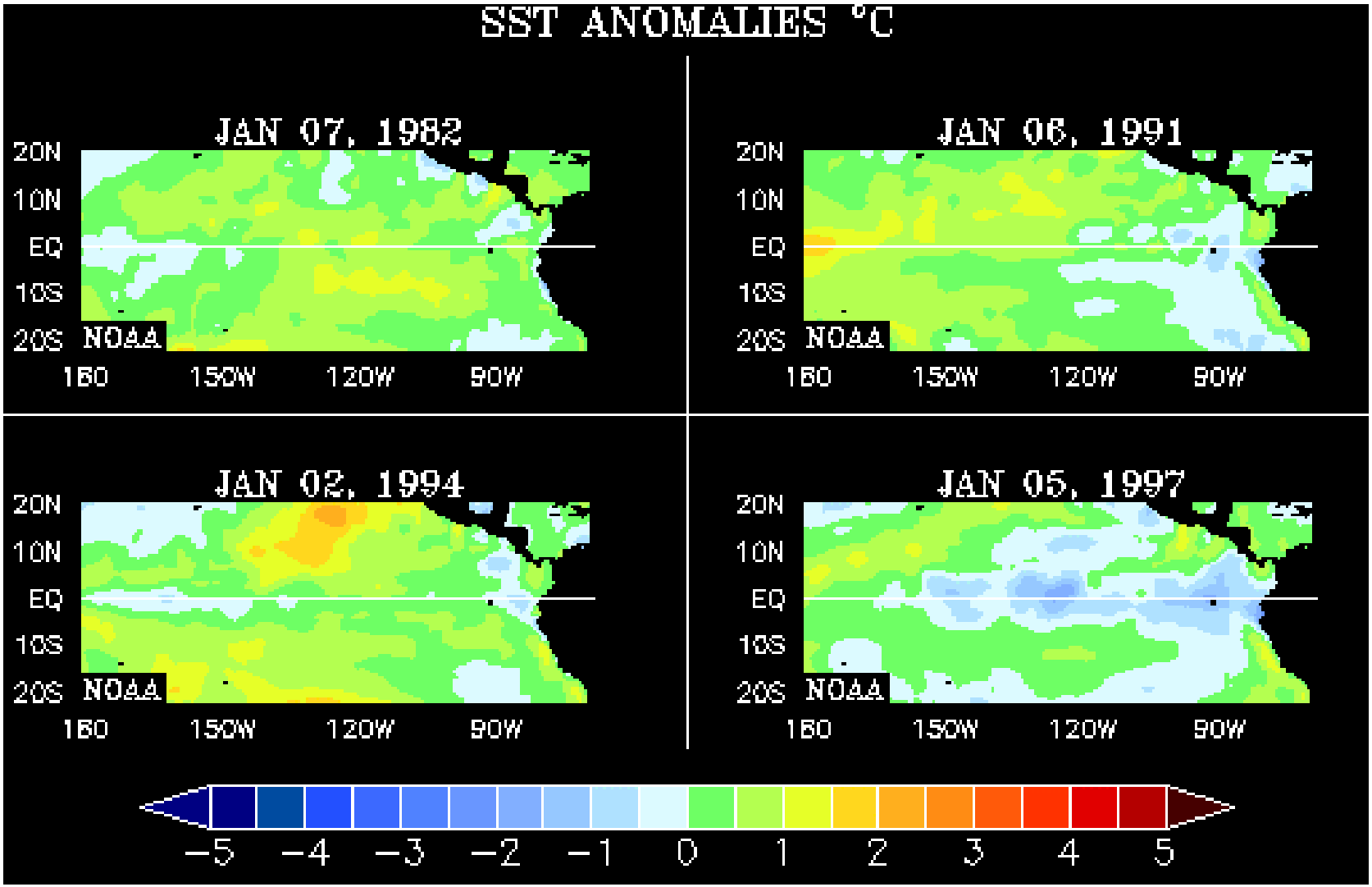
- During the 1997 El Niño droughts hit Malaysia, Indonesia and Brazil, exacerbating the huge forest fires. Many people had respiratory problems.
- Dengue fever seems to increase in parts of southeast Asia during times of El Nino. Also, Australian Encephalitis increases in Australia.

So improved climate prediction may result in improved health care and agricultural production.

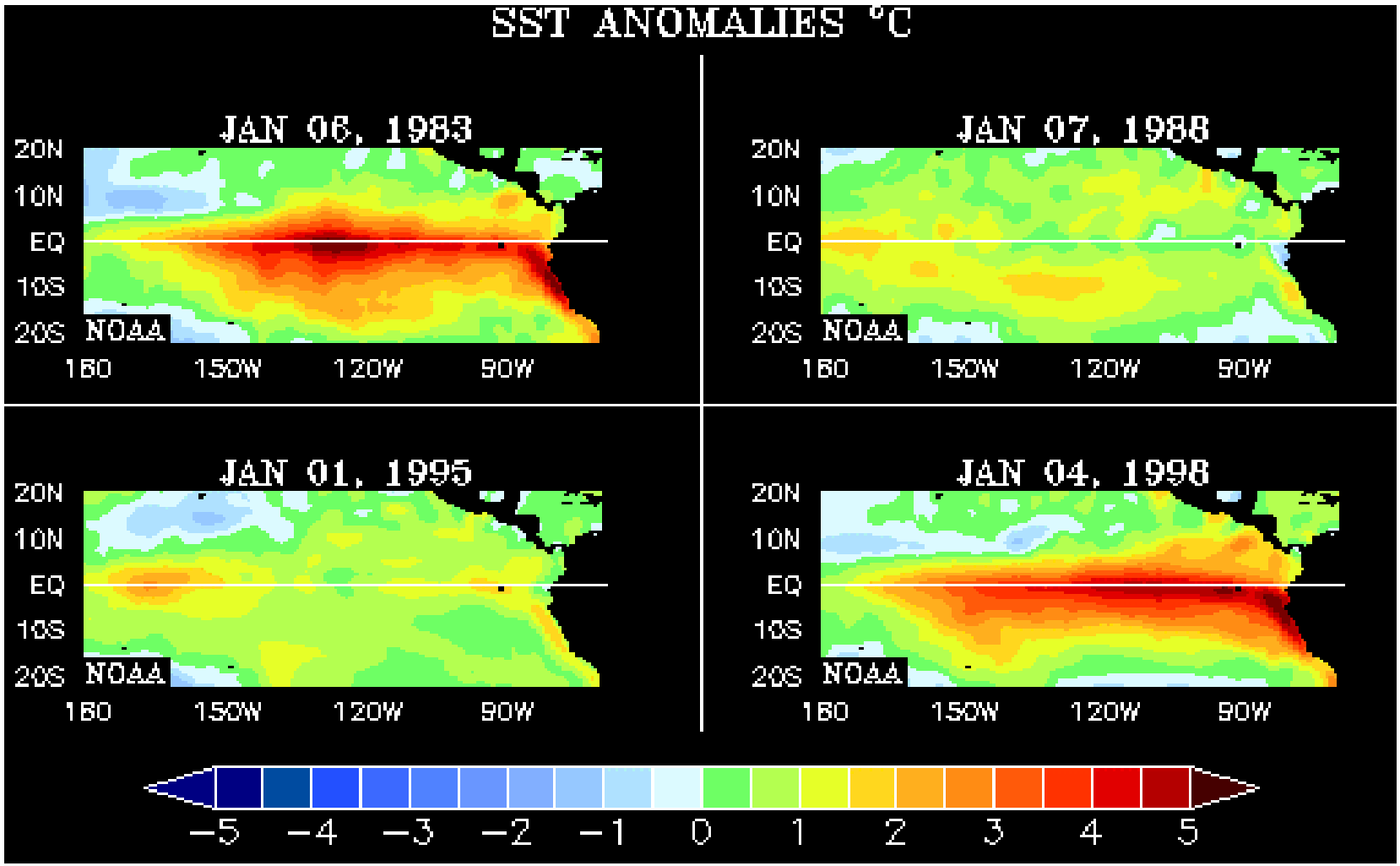
Sea Surface Temperatures



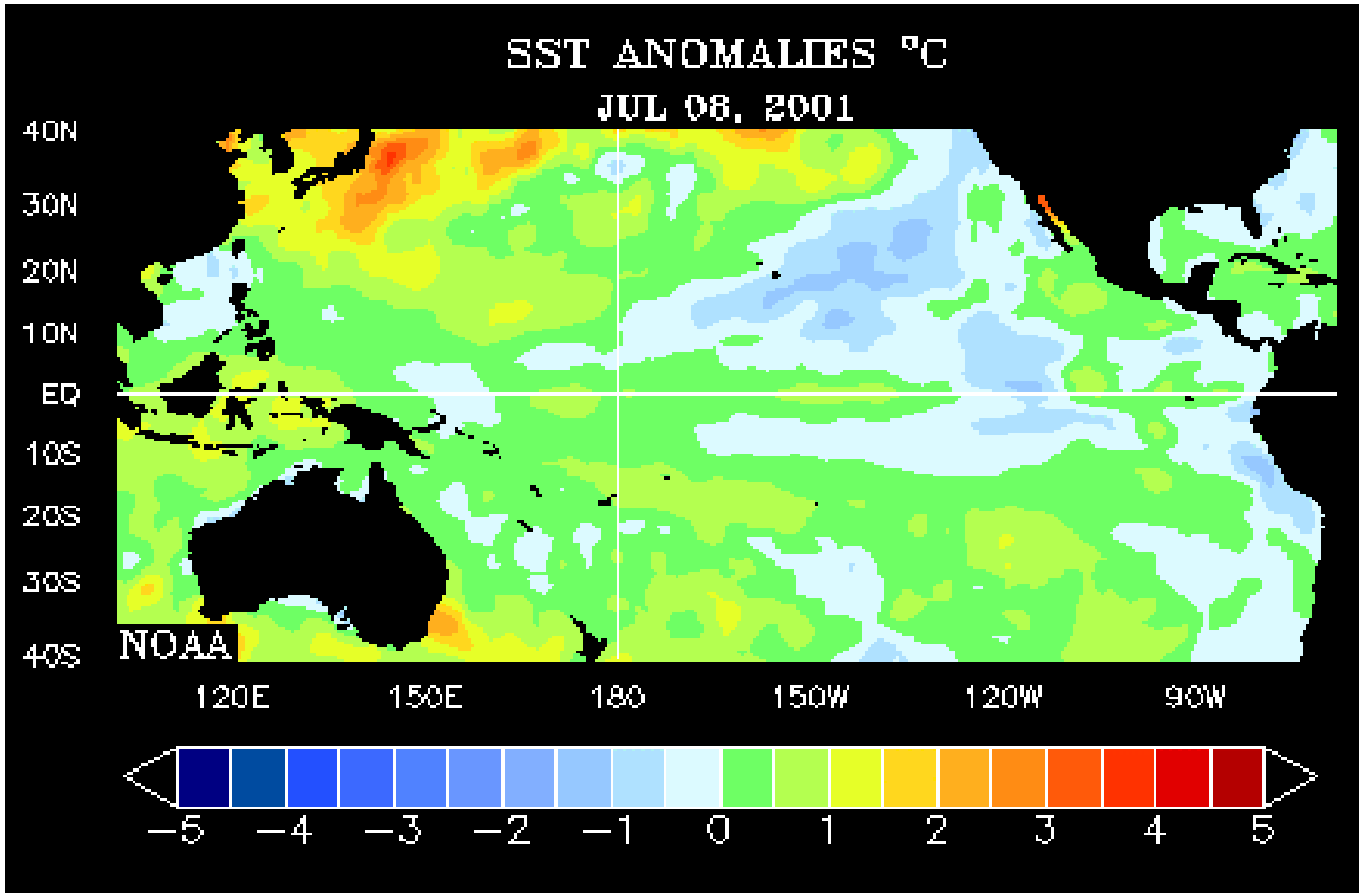
4 El Ninos


SST ANOMALIES °C
JAN 07, 1982
JAN 06, 1991
JAN 02, 1994
JAN 05, 1997
20N
10N
EQ
10S
20S
NOAA
160
150W
120W
90W
−5
−4
−3
−2
−1
0
1
2
3
4
5

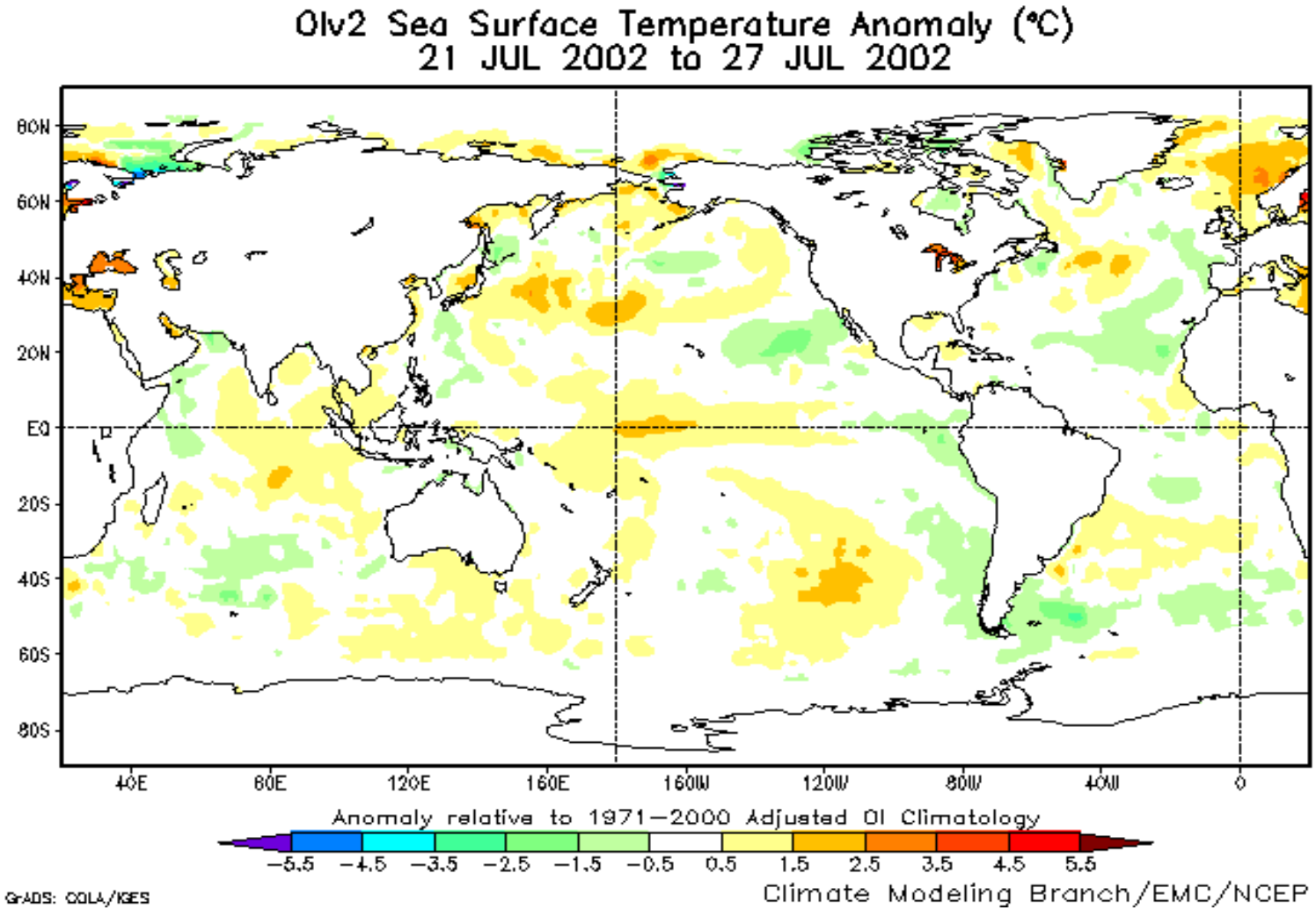
4 La Ninas


SST ANOMALIES °C
JAN 06, 1983
JAN 07, 1988
JAN 01, 1995
JAN 04, 1998
20N
10N
EQ
10S
20S
NOAA
180
150W
120W
90W
−5 −4 −3 −2 −1 0 1 2 3 4 5

Current patterns

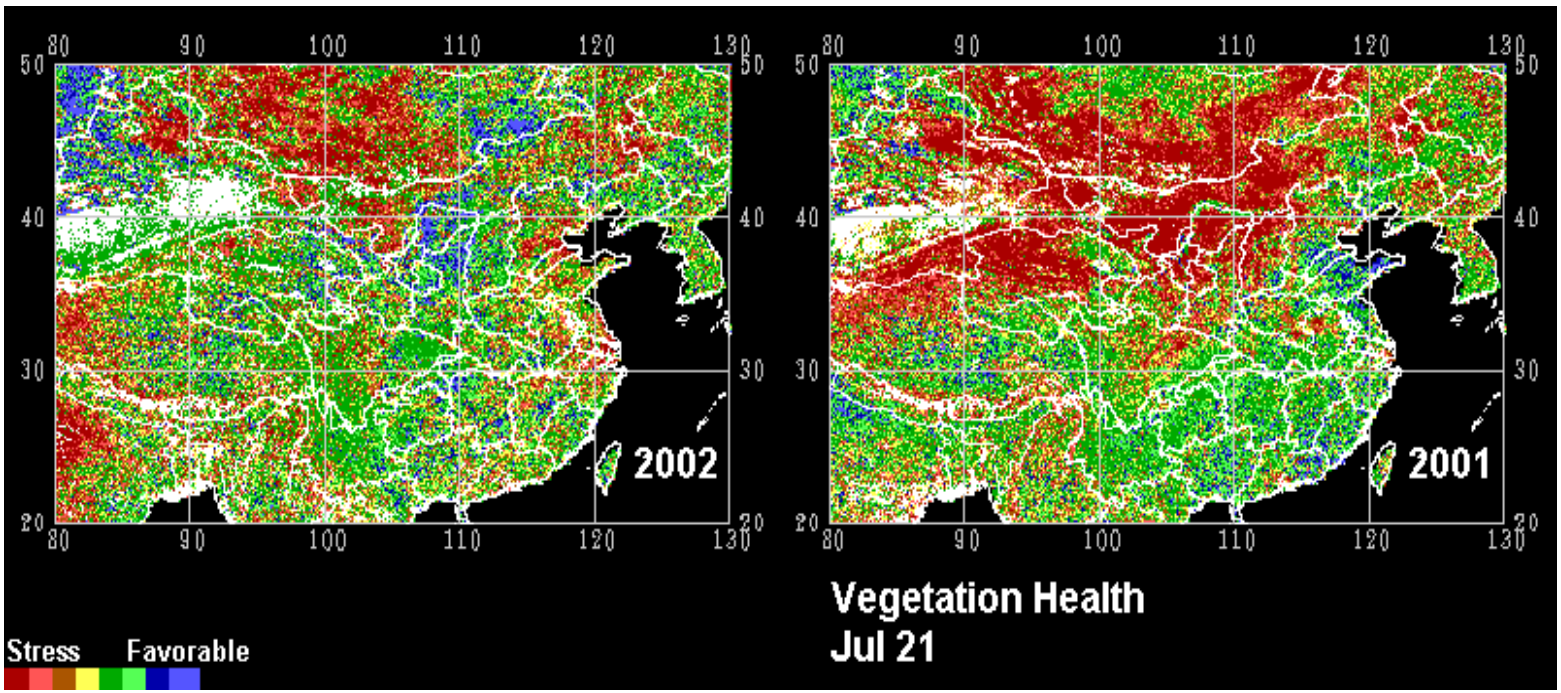


The current map



Satellite views:
Vegetation vigour in July 2002, 2001

Imagine using such information to guide farmers
on possible agricultural tactics for these conditions.

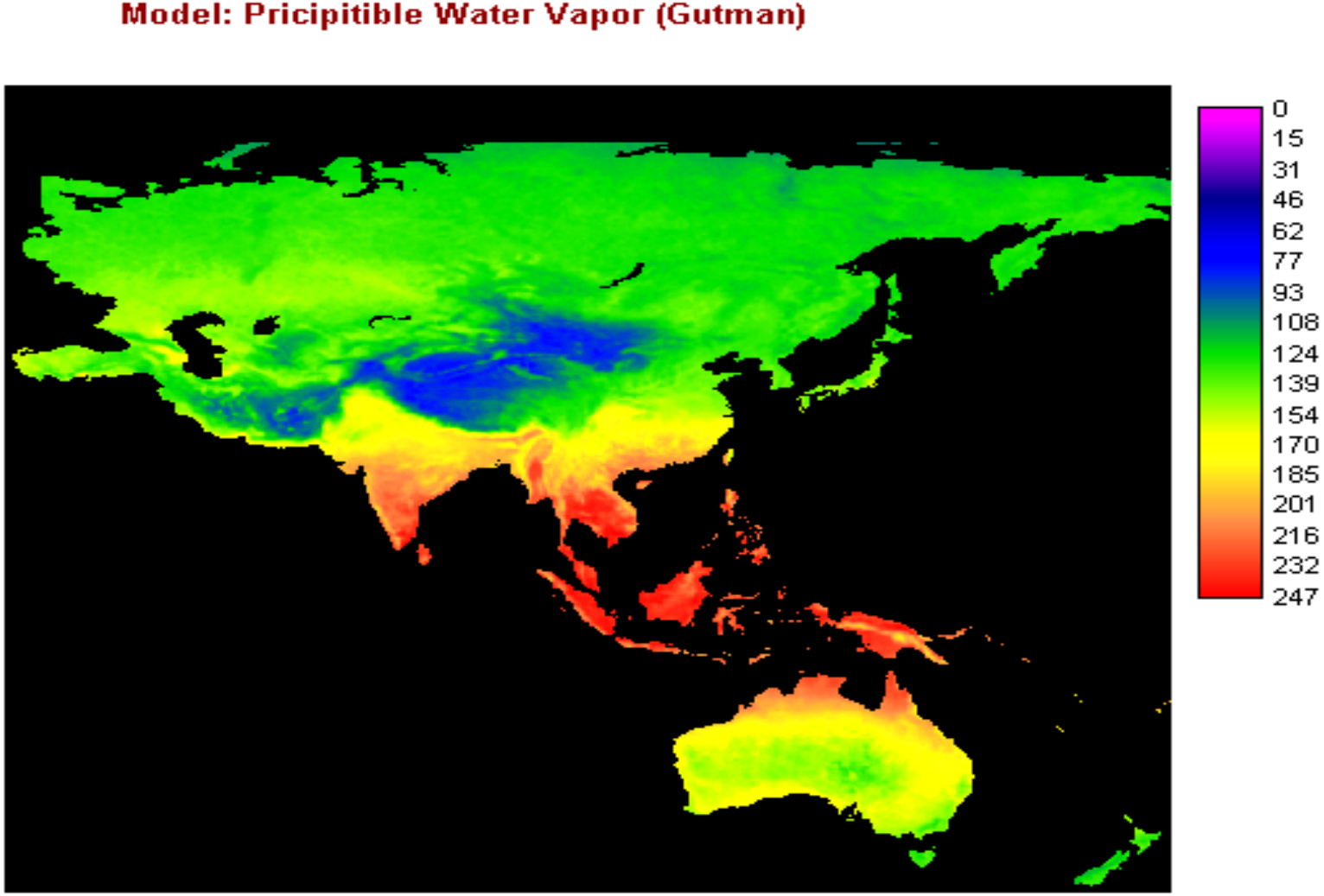


El Nino/La Nina and capacity-building

Imagine a three-stage operational system:

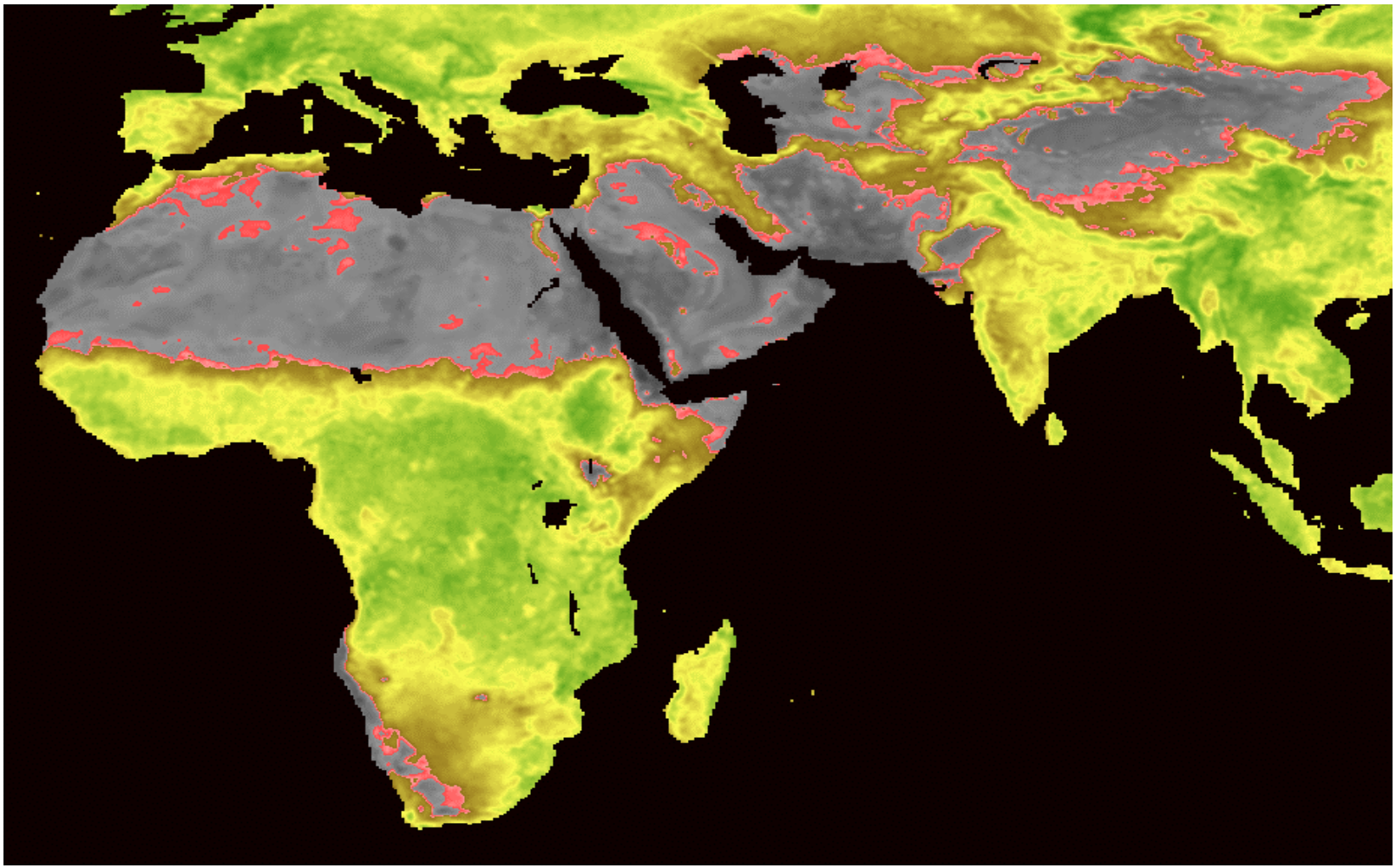
1. Local associations between El Nino/La Nina and agriculture, or disease (e.g. dengue fever or malaria). Provide climate-based advice to affected people.
2. Observations of current conditions (agriculture and health care interpretations) to refine advice to current conditions.
3. Ten-day weather forecasts to help guide short-term tactics in agriculture, health care, etc.

Such a capability is arguably ready to operationalize.



Available atmospheric water, modeled from thermal infrared imagery.

A NDVI-based strategy:
Deserts, and areas at risk of desertification.



Conclusions

1. Many data are now available for use in the Asia-Pacific Region.

2. The data are not perfect, so should be used with caution.

3. However, data availability, and quality, are improving, as application tools also improve. Thus, the future is bright.

4. Is it time to facilitate
   access,
   understanding, and
   help in utilization
   of such information? Some people think “yes.”

Some Websites

- Global Ecosystems Database: www.ngdc.noaa.gov/seg/eco/eco_sci.shtml
- Global Topography www.ngdc.noaa.gov/seg/topo/globe.shtml
- Global satellite-climatologies www.ngdc.noaa.gov/seg/fliers/gutavhrr.shtml
  www.ngdc.noaa.gov/seg/tools/gis/acrsclas.shtml
- Sea Surface Temperature and El Nino – current animation
  www.cdc.noaa.gov/map/clim/sst_olr/sst_anim.shtml
  SST analysis www.emc.ncep.noaa.gov/research/cmb/sst_analysis
  Today's El Nino information www.pmel.noaa.gov/tao/elnino/1997.html
- Climate maps from FAO:
  http://www.fao.org/WAICENT/FAOINFO/SUSTDEV/EIdirect/climate/EIsp0002.htm
- Current Vegetation Condition Maps:
  http://orbit-net.nesdis.noaa.gov/crad/sat/surf/vci/