

# **El Nino Returns every so often: 2014 is likely to be one of those “oftens”**

**WEBINAR El Nino Discussion with USAID/OFDA**

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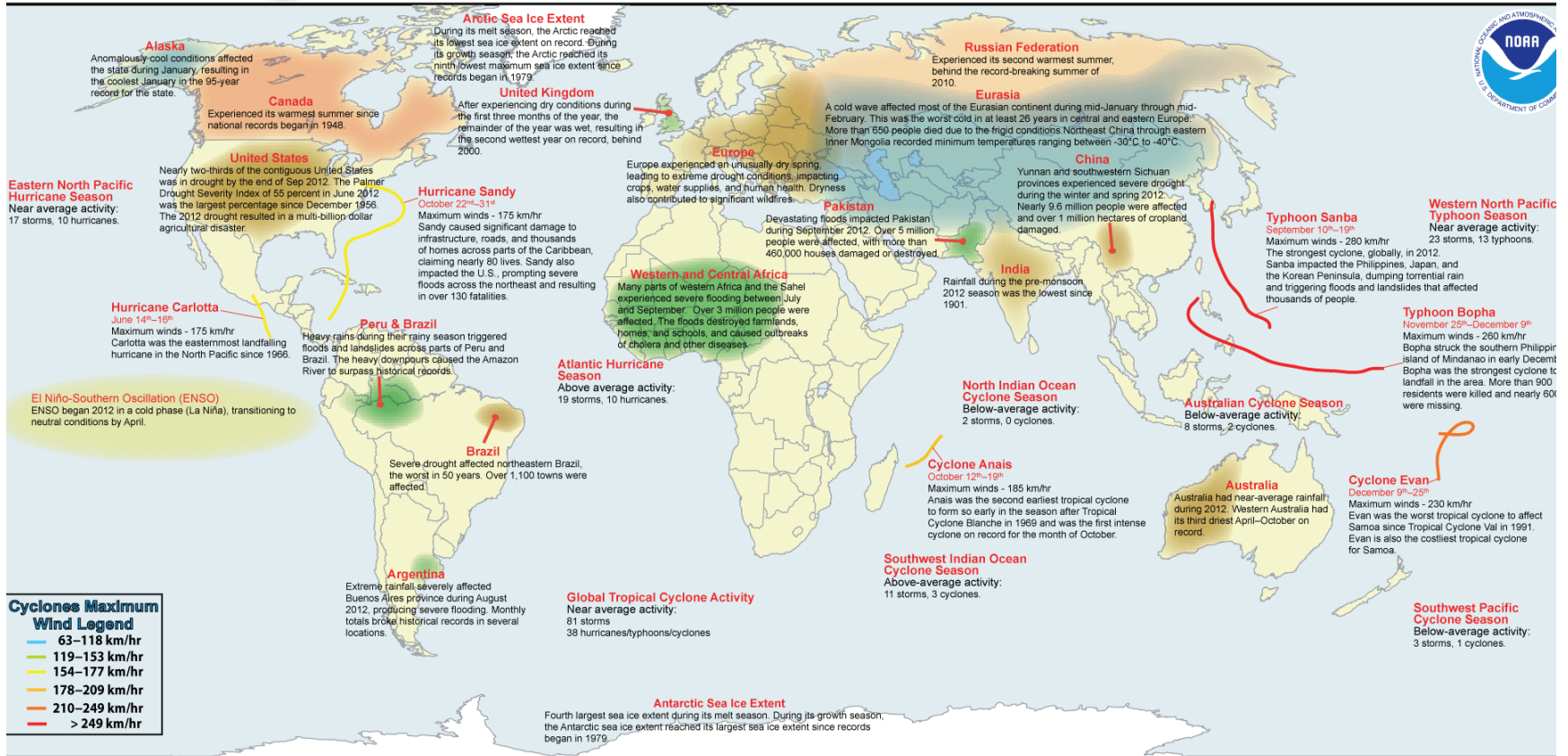
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# **17 years have passed since the last major El Nino**

- **Many people today forgot about the impacts of El Nino on human activities**
- **Educating people about El Nino and its possible impacts must be continual**
- **People tend to discount past information, believing that we are smarter today than they were 17 years ago!**

# The climate system is very noisy

## 2012 Significant Climate Anomalies and Events



# Regional Climate Anomalies and Disaster Risk Reduction (if not DR Avoidance)

- What we Know

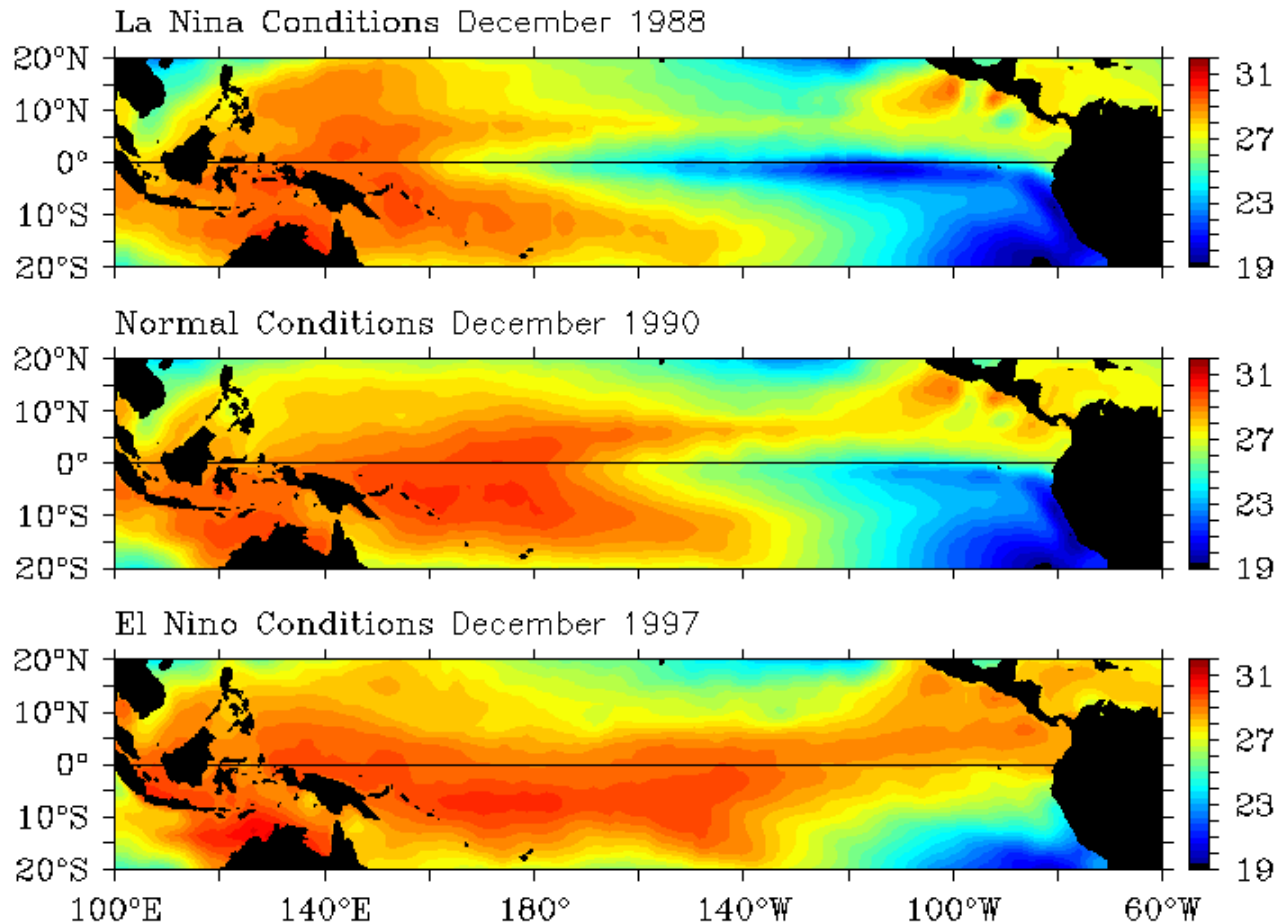
- Who is at risk
- Regions at risk
- Possibility of impacts
- History of previous anomalies' impacts
- What needs to be done to reduce risks

- What we don't know

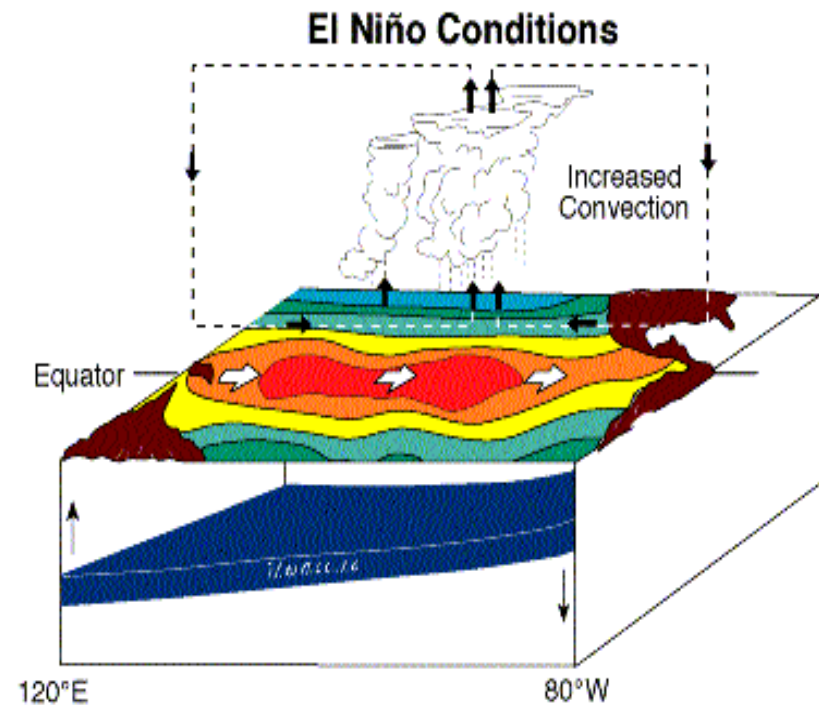
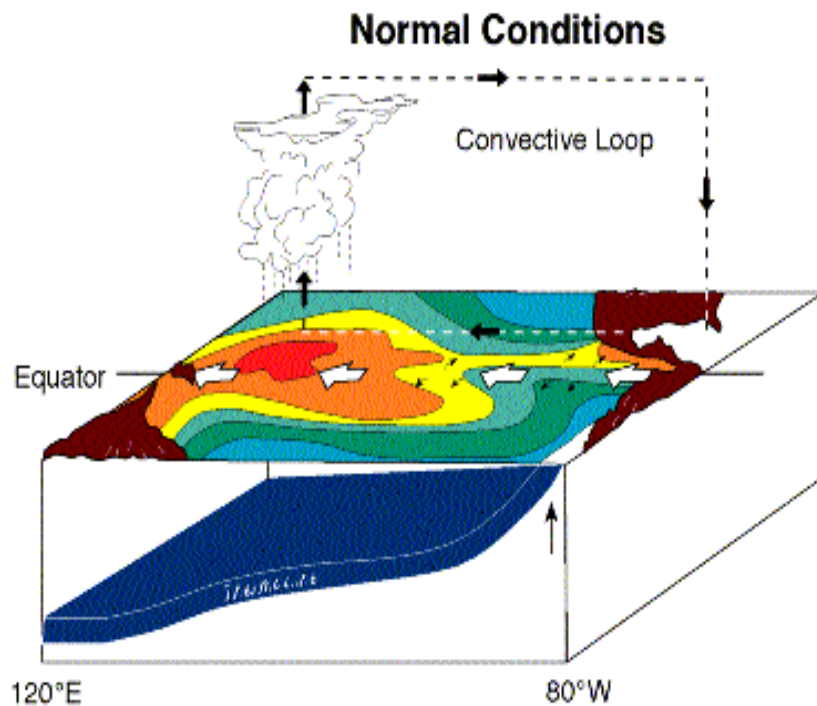
- When: timing of onset; timing of impacts: duration
- Exact intensity of El Nino
- Exact location of impacts
- Exactly who affected
- Impacts: food, energy, water, health, safety
- Surprises

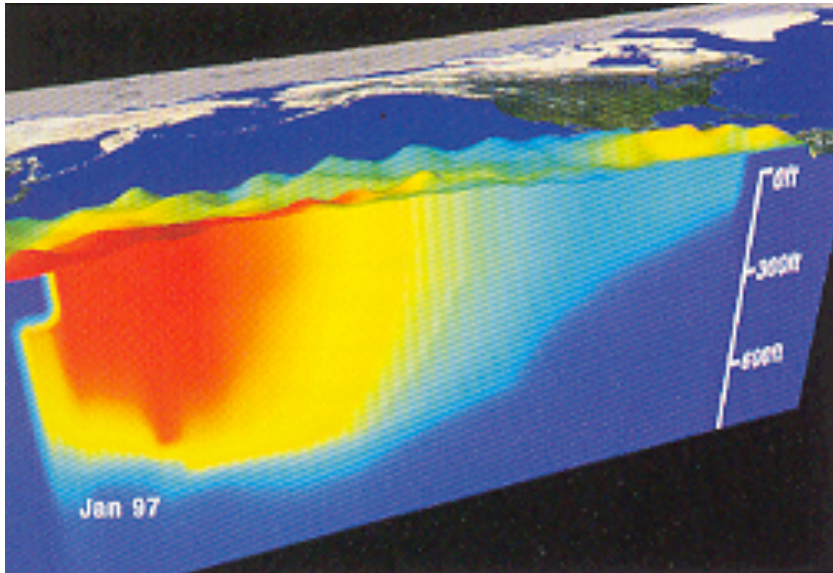
# What El Nino is: The ENSO cycle

Reynolds Monthly SST ( $^{\circ}\text{C}$ )

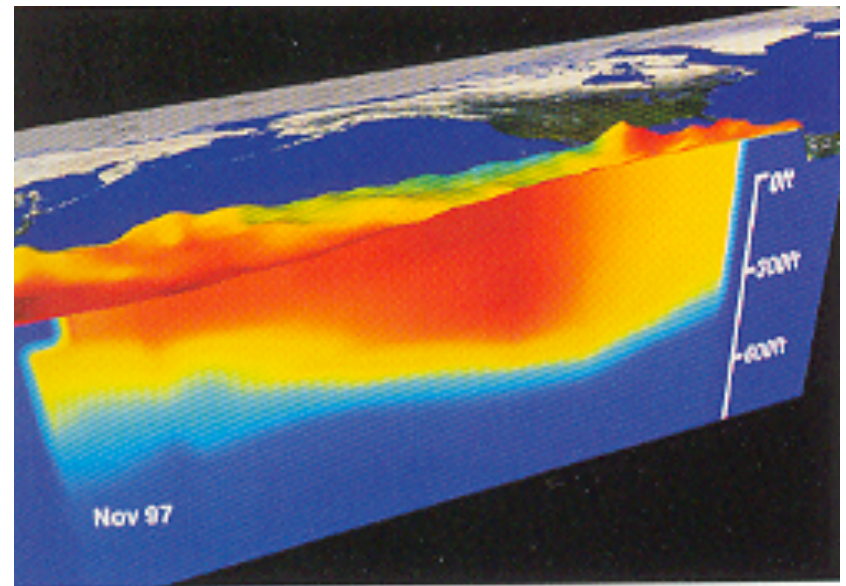


# EL NINO SCIENCE: Sea Temperature and Rainfall Changes in the Tropical Pacific



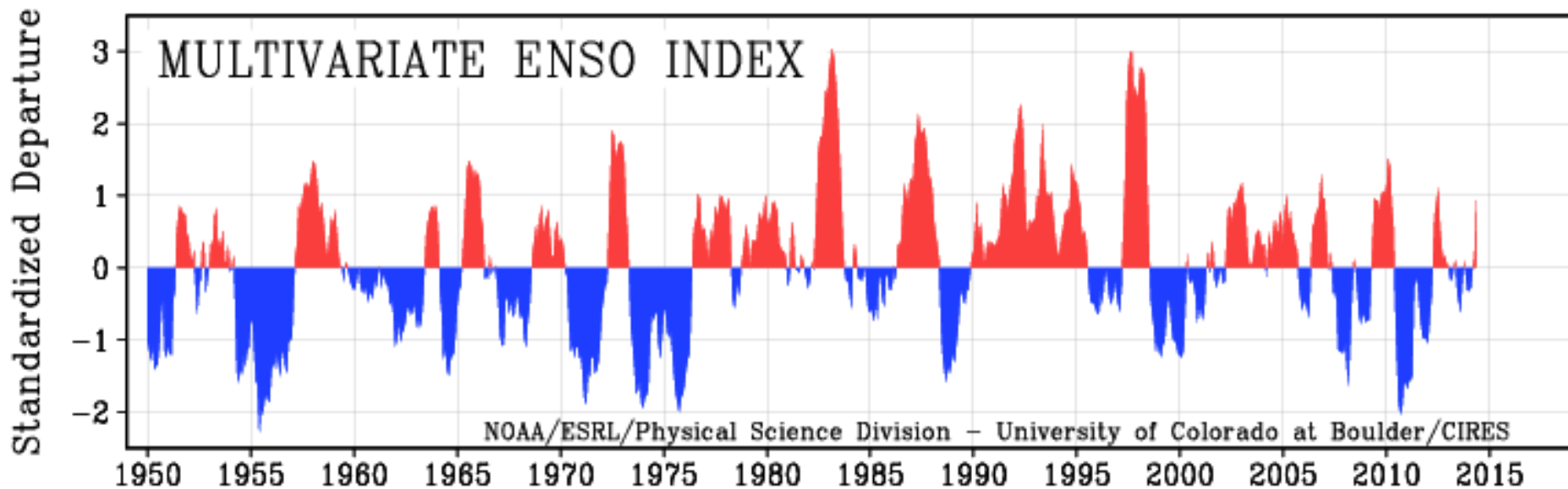


**Normal and La Niña  
Conditions**



**El Niño Conditions**

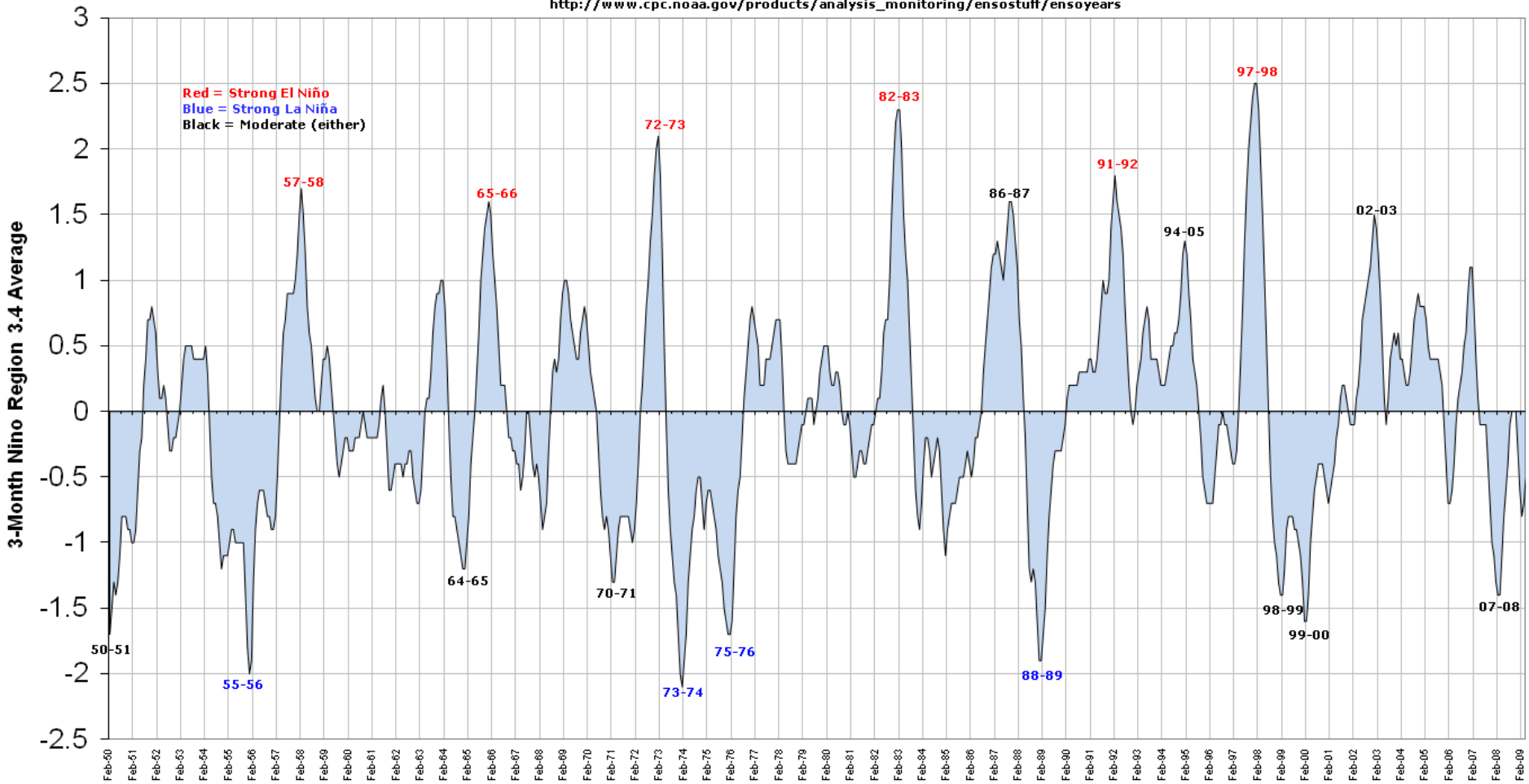
# Indices for El Niño (red) and La Niña (blue)



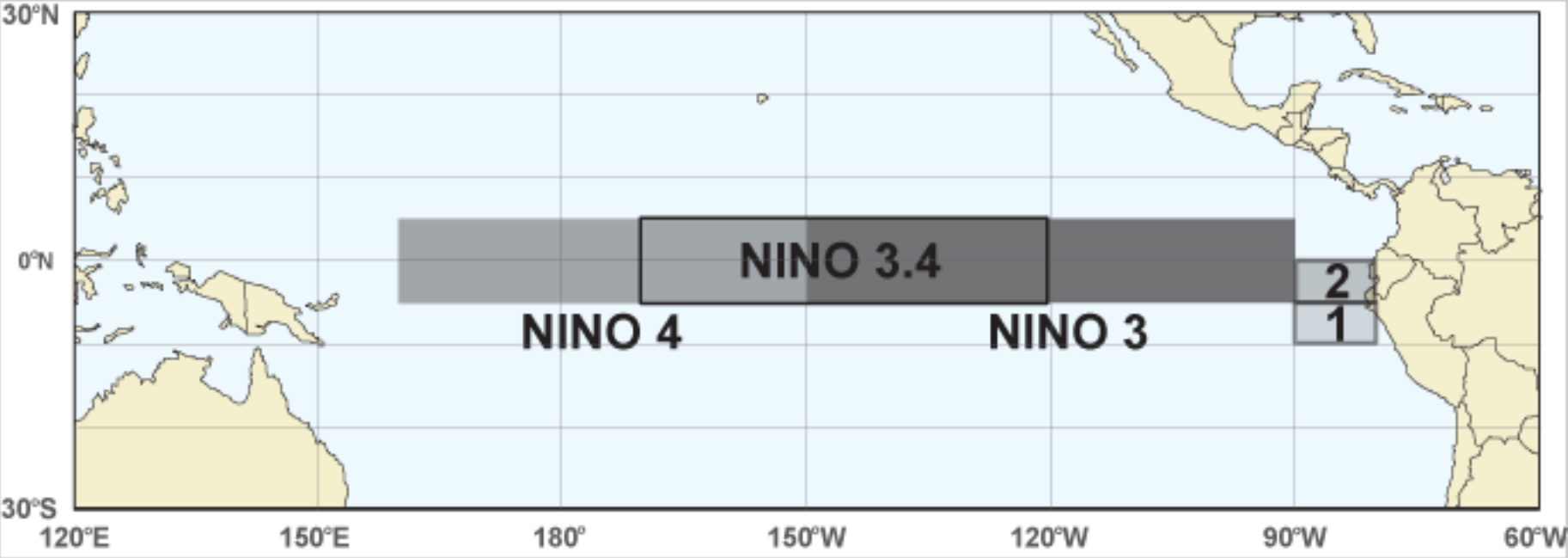


# Oceanic Niño Index (ONI)

[http://www.cpc.noaa.gov/products/analysis\\_monitoring/ensostuff/ensoyears](http://www.cpc.noaa.gov/products/analysis_monitoring/ensostuff/ensoyears)



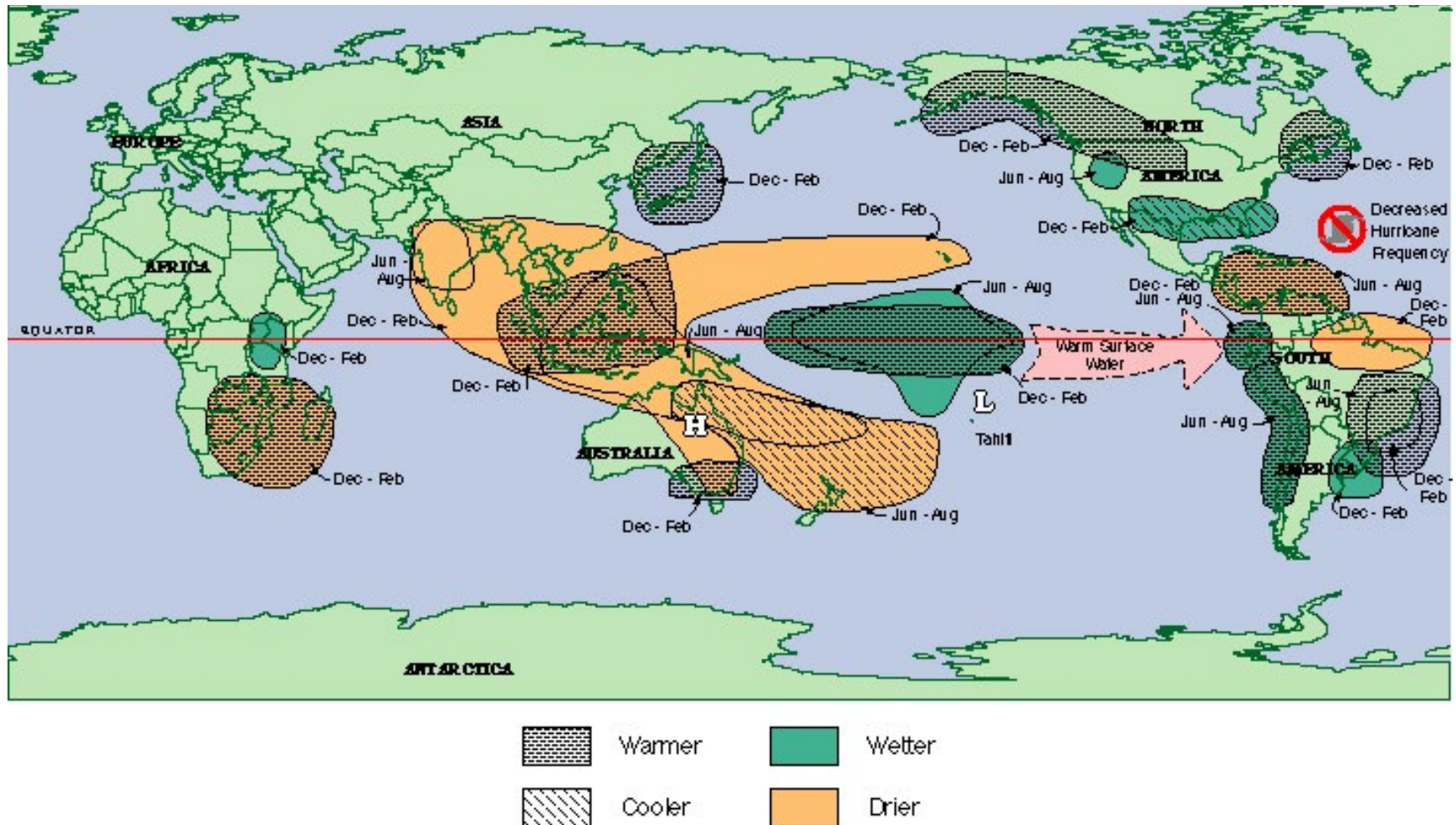
# Different El Nino monitoring regions



# What El Nino Can Do

- Provides a hint of “foreseeable” El Nino related problems:
  - shifting rainfall patterns
  - changes in streamflow
  - changes in demands for hydropower
  - water shortages
  - food production problems
  - infectious disease outbreaks
  - shifting living marine species
  - Negative economic impacts
  - Slow down development

# El Nino can spawn climate, water & weather hazards (called “teleconnections”)



# Evolution of interest in El Nino

- **1891**: First time coastal ocean phenomenon named El Nino by Peruvians
- **1969**: scientist link El Nino to basin wide phenomenon NOT just a concern for Peru
- **1972-73**: El Nino of the Scientists
- **1982-83**: El Nino of the Governments
- **1997-98**: El Nino of the People

# Where are we now?

## Wholesaling vs. Retailing El Niño Science

- **Wholesaling El Niño**

- *Broadcasting*
  - What it is
  - Why is it useful information
  - Who should use it?



- **Retailing El Niño**

- *Tailoring*
  - How to use it in specific locations, sectors, activities
  - Convincing people of its value
  - Demonstrating its usability



**El Niño drought could affect 25 million Africans**

*Según congresista peruano*

**El Niño affecting coming seasons**

*Bond Forecast Is Clouded By El Niño*

**El Niño reduces energy demands**

**El Niño impedirá conflicto**

**'\$1 BILLION RAINS'**

**Another soaking for El Niño**

**Outguessing El Niño**

*Commodities markets feel the tension*

**Fujimori against El Niño**

**El Niño será catastrófico**

*El Niño mantiene activos incendios en Indonesia*

*Inundaciones por El Niño en Brasil y Uruguay*

**厄尔尼诺肆虐海南干旱严重**

*Weather experts fear the worst is coming.*

**El Niño bolsters Hurricane Linda**

**El Niño upheaval**

*El Niño effect warms waters off California*

**РЫНКИ ПОД ВЛИЯНИЕМ ЭФФЕКТА «ЭЛЬ НИНО»**

*Wily El Niño has forecasters scratching head*

**El Niño looms, but it won't be all bad**

**El Niño could be easy on winter heating bills**

**Girding for El Niño**

*For some, 'It's almost reached the level of panic'*

**Devastating El Niño Forecast**

*Scientists fear ecosystem chaos*

**El Niño: Preparing for the Worst**

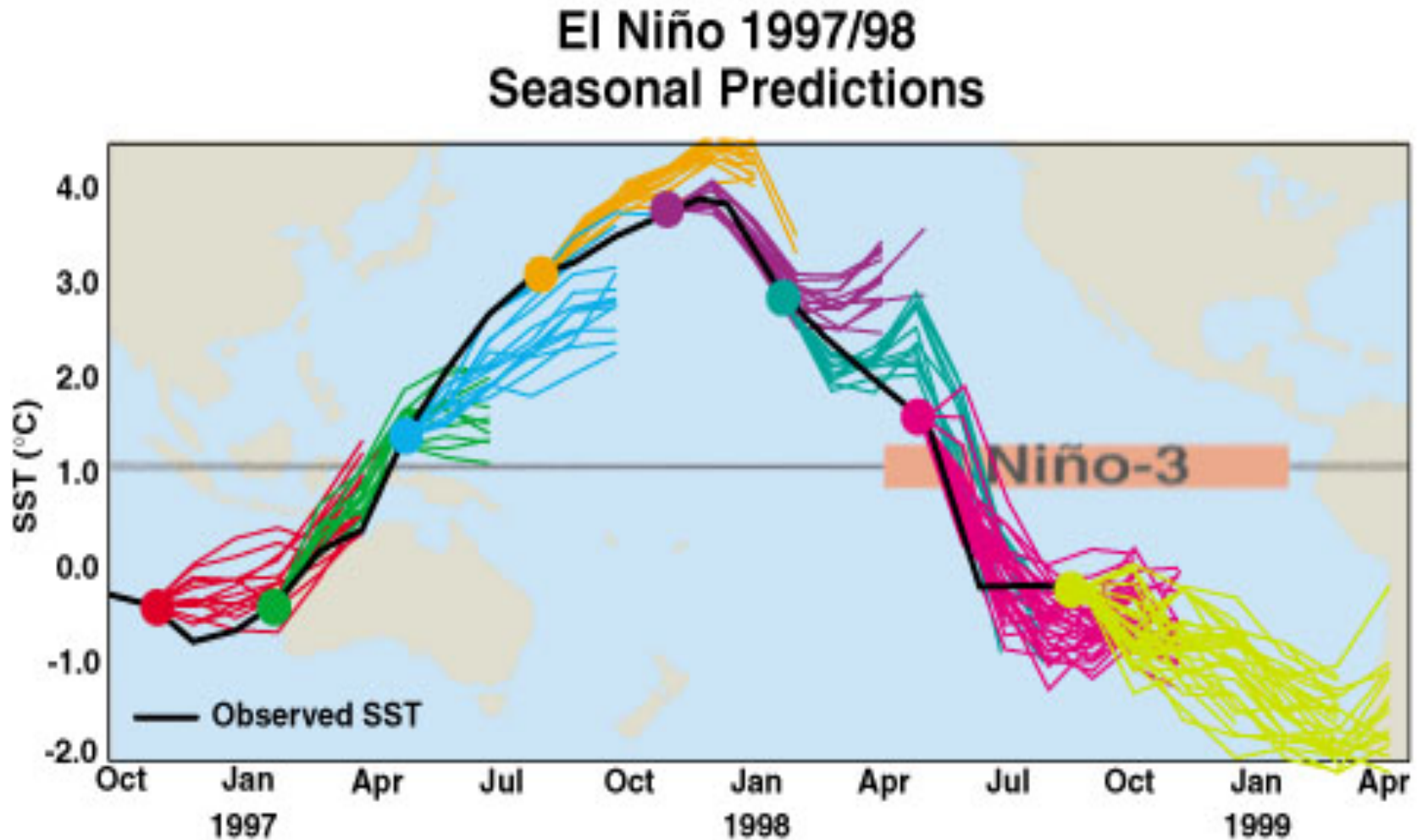
**EN NI-NO GÂY KHÔNG ÍT THIẾT HẠI CHO VÙNG ĐÔNG Á**

**EL NINO PEAKS**

**-but will second wave come?**

# Resilient Adaptation:

Flexible response to an uncertain future



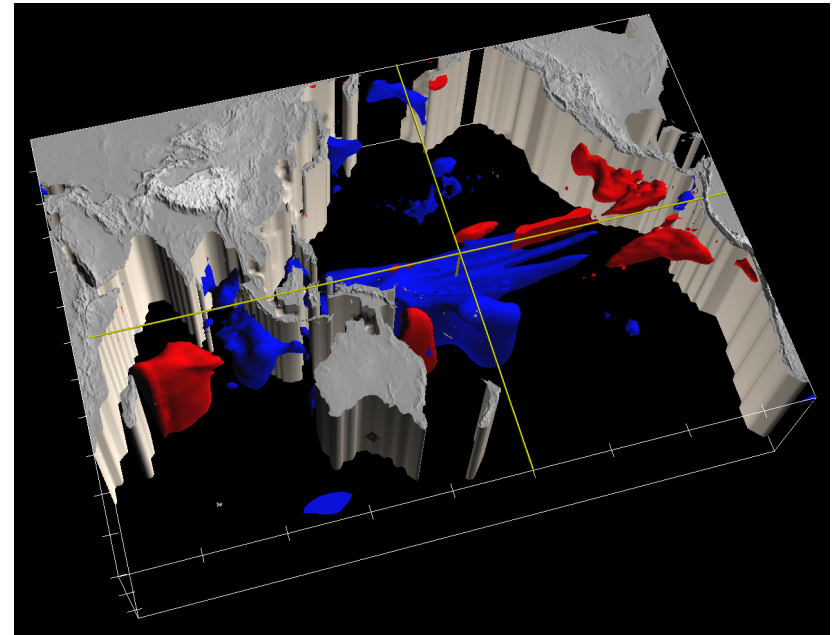
Source: ECMWF



- **Considerable attention is focused on forecasting El Nino's onset.**
- **This provides early warning to some but not all countries.**
- **Forecasting its onset does not tell us much about its development, that is, about its magnitude (weak, moderate, strong, extraordinary) or the length of its duration**

# Forecasting El Niño : some science, some art

- Forecasting is not a thankful job
- People remember missed forecasts more so than correct ones
- Forecasts for many provide one piece of information to user
  - People rely on their own set of indicators
- Forecasts have a ripple effect
  - First: they stimulate challenges, agreements, actions
  - Then: they stimulate downstream forecasts



[www.gfdl.noaa.gov/.../el-nino\\_la-nina\\_046.png](http://www.gfdl.noaa.gov/.../el-nino_la-nina_046.png)

- El Niño events can vary in timing and rate of onset, in timing and rate of collapse, in magnitude, intensity, and frequency of occurrence
- 
- Once an El Niño locks in, it will run its course over several months
- 
- El Niño forecasts should be of interest to most government ministries and agencies, not just meteorological services
- 
- Our best guide to El Niño impacts is to look back in order to gain a glimpse of what might happen in the future

# **Governments do not respond to the same forecast in the same way**

- Each government will respond to an El Niño forecast in its own way, as governments have to take into account the societal conditions at the time an El Niño is forecast.
  - **Peru**
  - **Kenya**
  - **Costa Rica**

# Communicating about El Niño has been a challenge

**El Niño is not just about science and forecasting.**

## **It is about impacts:**

- on ecosystems: land and sea,
- on various sectors of societies,
- on policy and politics,
- on economics,
- on equity issues

# Communicating about El Nino:

How do you “sell” a product (a forecast) that is admittedly complex, multifaceted, uncertain and imperfect !

- **Reality check:**

- There are conflicting perceptions about the reliability of El Niño forecasts

- Perceptions of scientific community
- Perceptions of the forecasting community
- Perceptions of the users
- Perceptions of the public
- Perceptions of the media



The ultimate Swiss Army knife: something for everyone

# El Nino related CONCEPTS to keep in mind

- **Teleconnections**
- 
- **Resilient adaptation**
- 
- **Forecasting by analogy**
- 
- **Foreseeability**
- 
- **High-impact weather, water and climate events**
- 
- **Superstorms, and seasons of superstorms**
- 
- **Changes in Seasonality**
- **A changing climate**

# **9 Things People Ought to Know About El Niño**

- 1. El Niño does not represent unusual behavior of the global climate.**
- 2. El Niño is part of a cycle.**
- 3. Every weather anomaly worldwide that occurs in an El Niño is not caused by that El Niño.**
- 4. El Niño has a positive side as well.**
- 5. There will continue to be surprises associated with future El Niño events.**
- 6. The impact of global warming on El Niño is not as yet known, speculation notwithstanding.**
- 7. Forecasting El Niño is different than forecasting the impacts of El Niño.**
- 8. El Niño is the earliest warning of impending disaster that a government can receive**
- 9. El Niño impacts should be of interest to all countries.**



# **7 El Niño “Traps”**

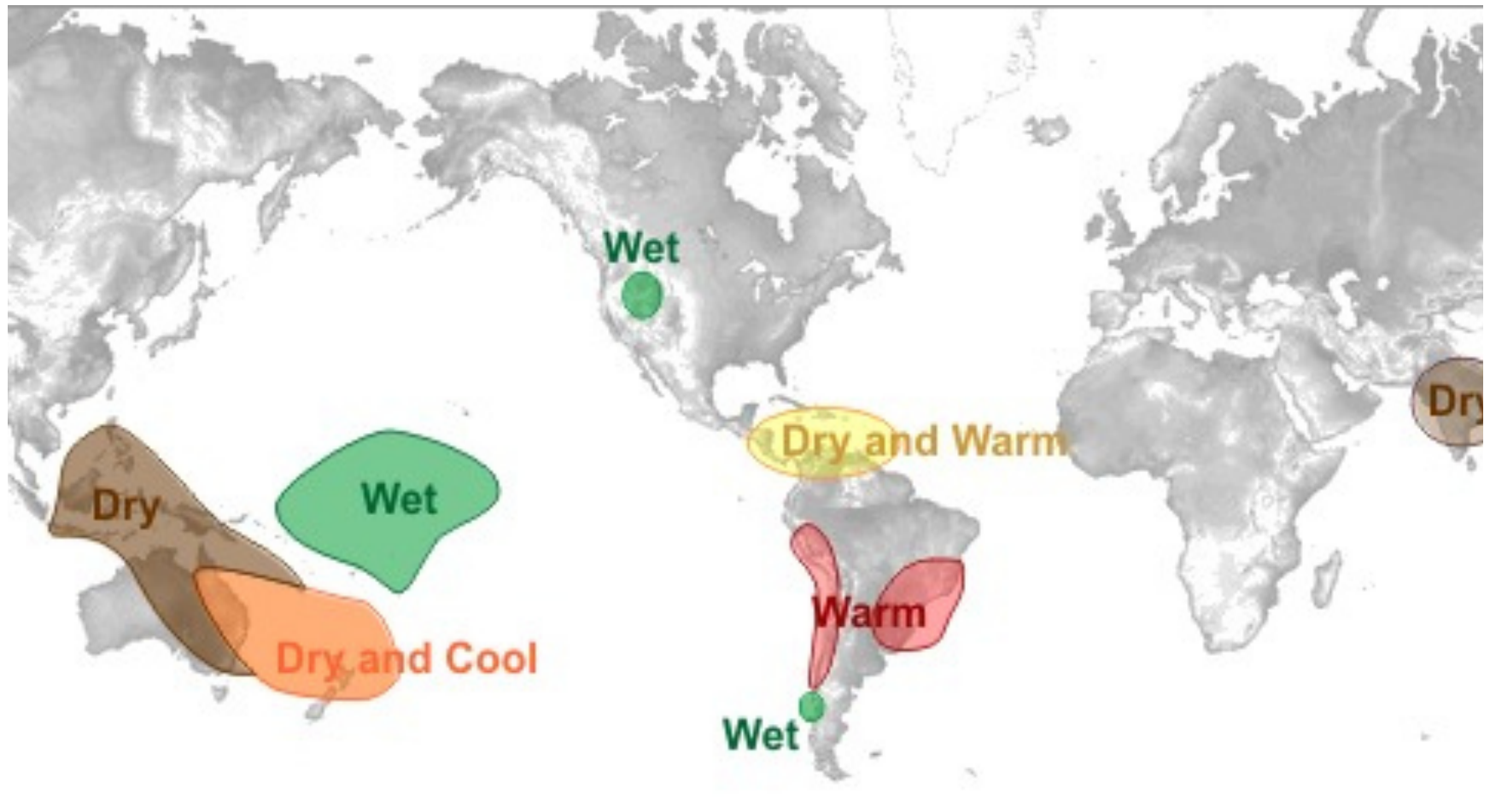
## **That People Ought to Know About**

- 1. Forecasting El Niño’s onset does not tell us much about its other characteristics (e.g., magnitude, frequency, duration)**
- 2. Monitoring El Niño is different than forecasting it.**
- 3. When viewed as an event, El Niño evokes different concerns than when it is viewed as part of a process.**
- 4. A pretty website does not an El Niño expert make.**
- 5. The media do not have a neutral interest in reporting about El Niño.**
- 6. Beware of the use of El Niño analogies (e.g., this event is like the 1972-73 or 1982-83 or the 1997-98 event).**
- 7. It is misleading to blame any specific weather event on El Niño, just because it took place during an El Niño.**

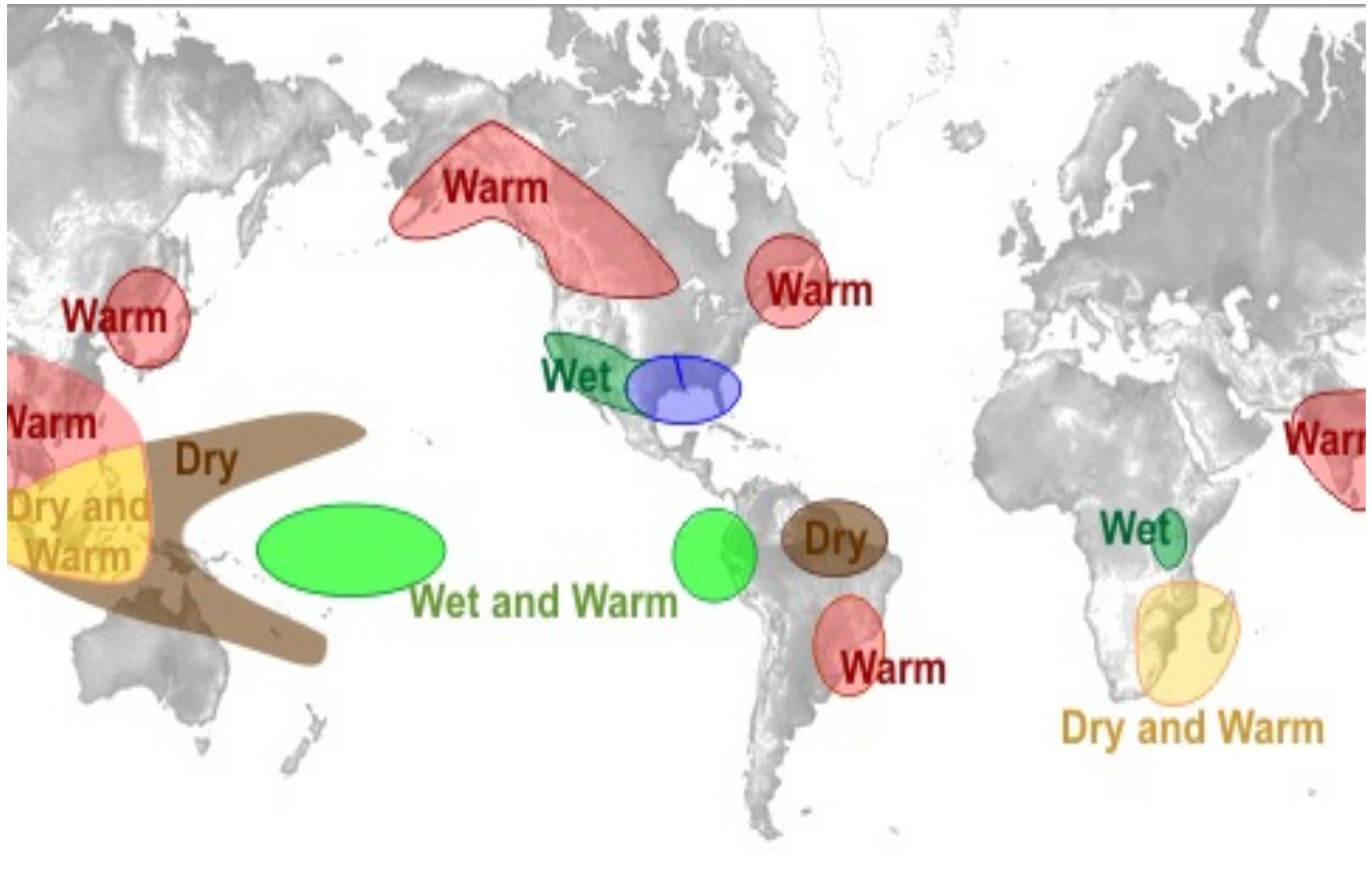
# **IMPACTS MAPS**

## **ppt appendix**

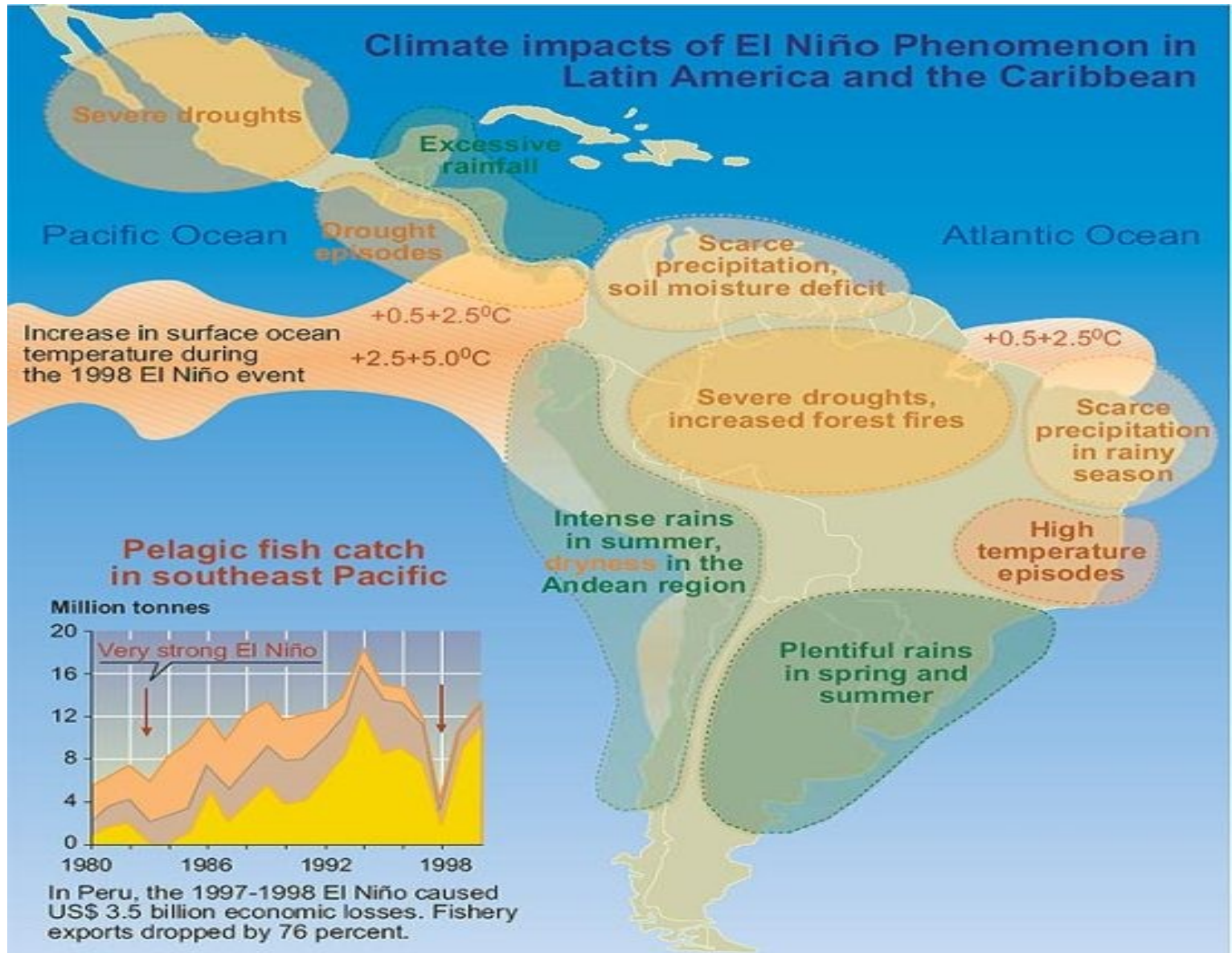
# El Niño effect June through August



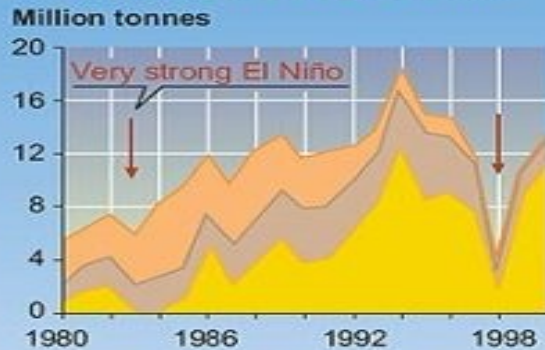
# El Niño effect December through February



# Climate impacts of El Niño Phenomenon in Latin America and the Caribbean

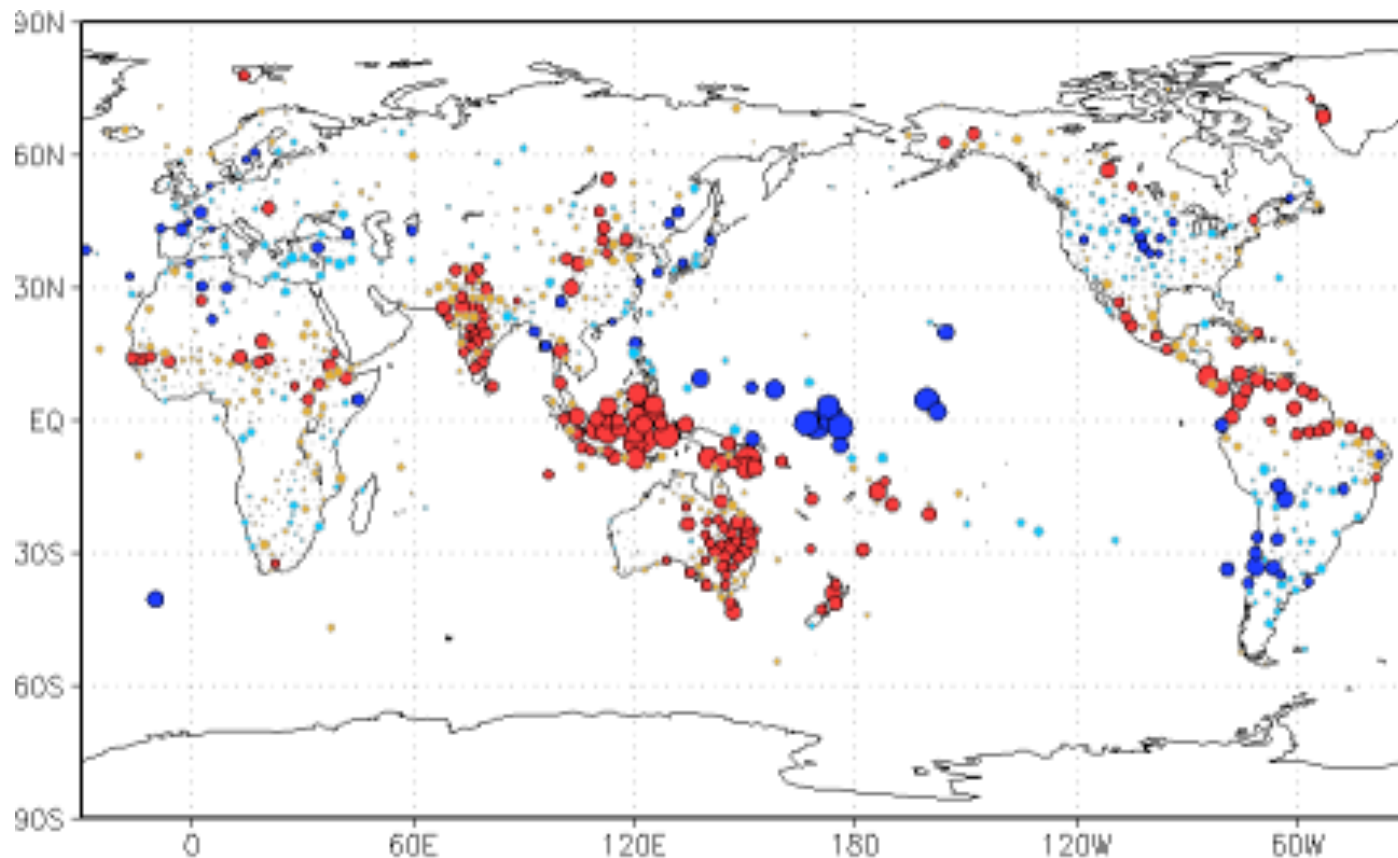


## Pelagic fish catch in southeast Pacific

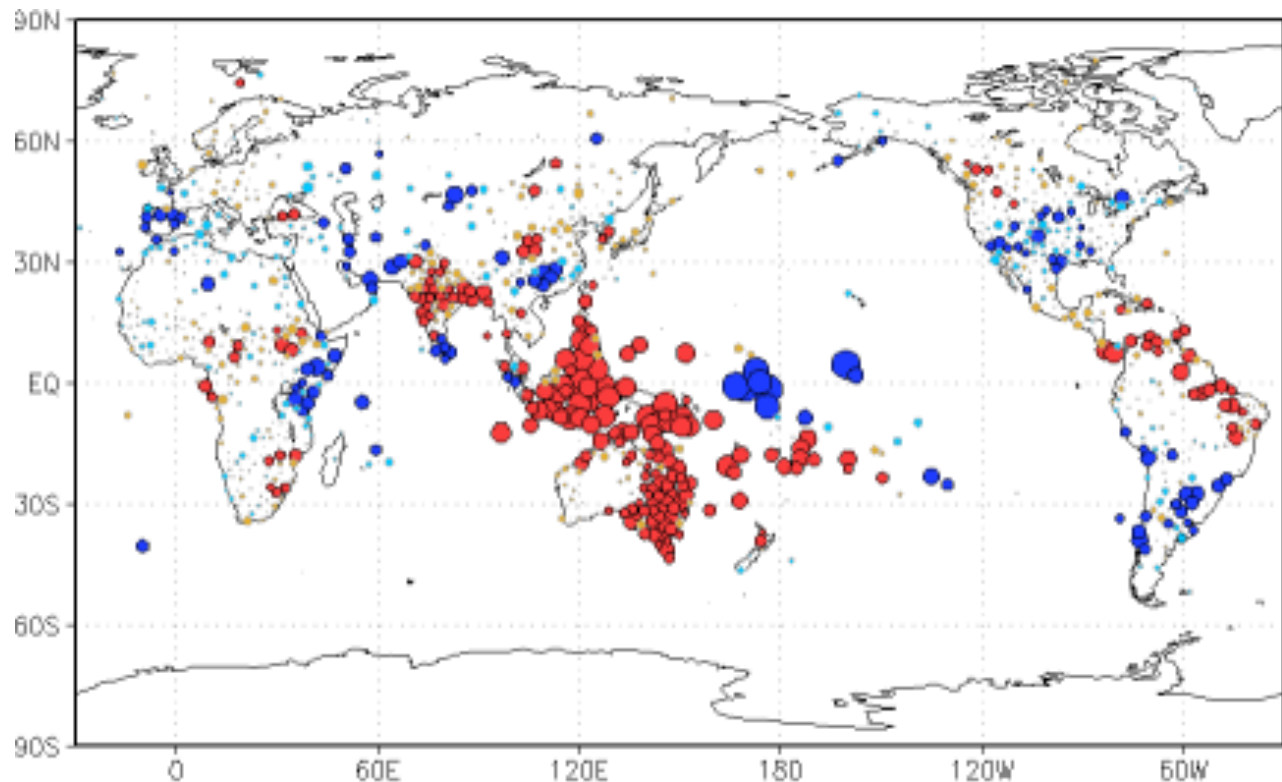


In Peru, the 1997-1998 El Niño caused US\$ 3.5 billion economic losses. Fishery exports dropped by 76 percent.

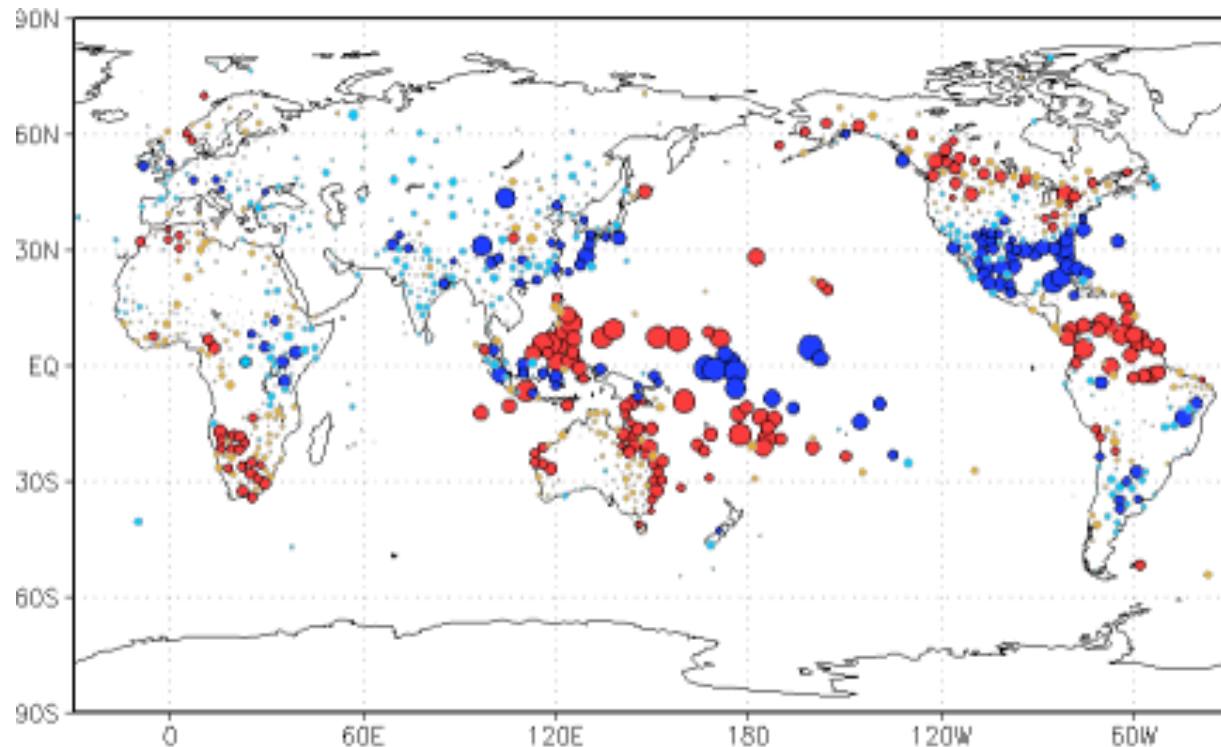
- **June-August** In these months eastern Indonesia often suffers droughts during El Niño. The rain zone has moved east to the islands along the equator in the Pacific Ocean. The Indian Monsoon is often weaker during El Niño, although by no means always. <[www.knmi.nl/research/global\\_climate/enso/effects/](http://www.knmi.nl/research/global_climate/enso/effects/)>



- **September-November** This season the effects of El Niño are strongest. Almost all of Indonesia, the Philippines and eastern Australia are drier than usual during most El Niño events. Large parts of India are often drier than usual, but the Sri Lanka and some southern states get more rain. East Africa, parts of Central Asia and Spain are also on average wetter than normal during El Niño in this season, as are Chile and Uruguay. <[www.knmi.nl/research/global\\_climate/enso/effects/](http://www.knmi.nl/research/global_climate/enso/effects/)>



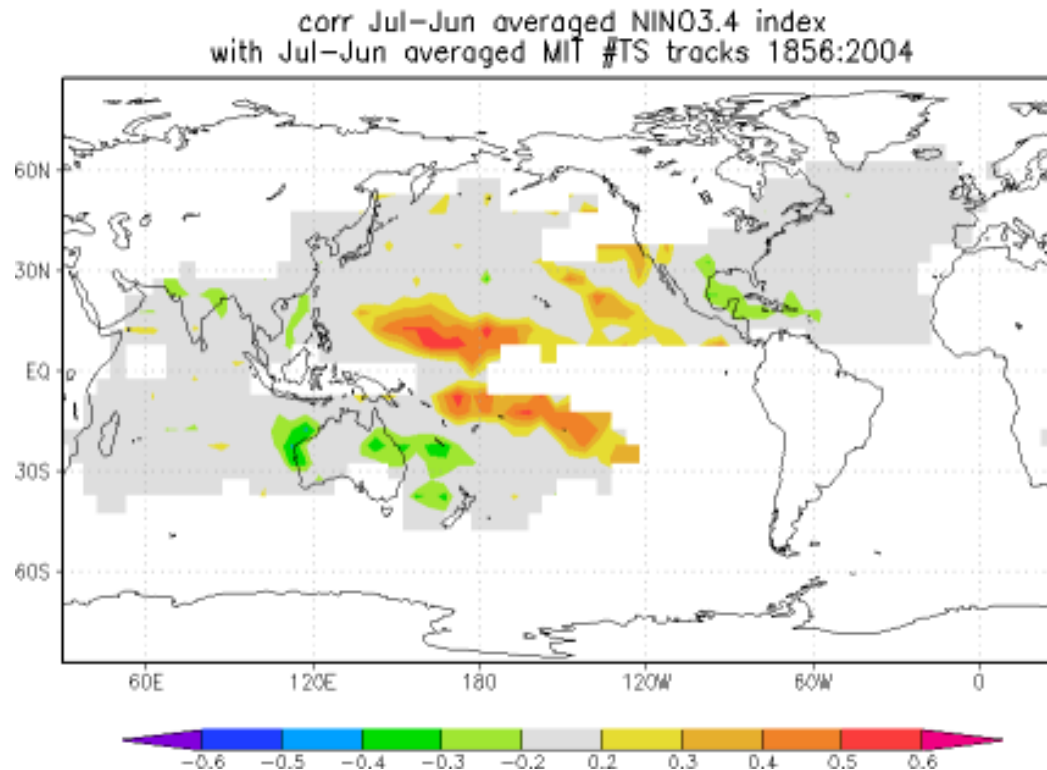
- **December-February** In boreal winter the Philippines and East Indonesia stay drier, whereas the Pacific islands along the equator remain wetter. Florida also gets more rain than normal during El Niño, this effect extends to other southern states of the U.S. and into Mexico. *South Africa is more frequently dry*, as is the northern coast of South America and some of the leeward Antilles. In Uruguay and South Brasil rainfall increases on average. Along the coasts of Ecuador and Peru rainfall increases when the coastal waters heat up, an effect also named El Niño but not always coincident with the warming along the equator that affects the rest of the world. <[www.knmi.nl/research/global\\_climate/enso/effects/](http://www.knmi.nl/research/global_climate/enso/effects/)>





# • Tropical Cyclones

- During El Niño there are *on average fewer hurricanes over the Atlantic Ocean, the Caribbean Sea and the Gulf of Mexico*. La Niña often brings more. *The west coast of Mexico and the United States see more landfalling hurricanes* during El Niño. In the *central Pacific Ocean El Niño brings more typhoons, both north and south of the equator*. Their *more easterly genesis* makes that *fewer of these tropical cyclones reach Australia*. In the *northern Pacific Ocean the area with typhoons also shifts east*. There are no effects on the number of cyclones over the Indian Ocean.



# 1997-98 Likely El Nino Impacts

