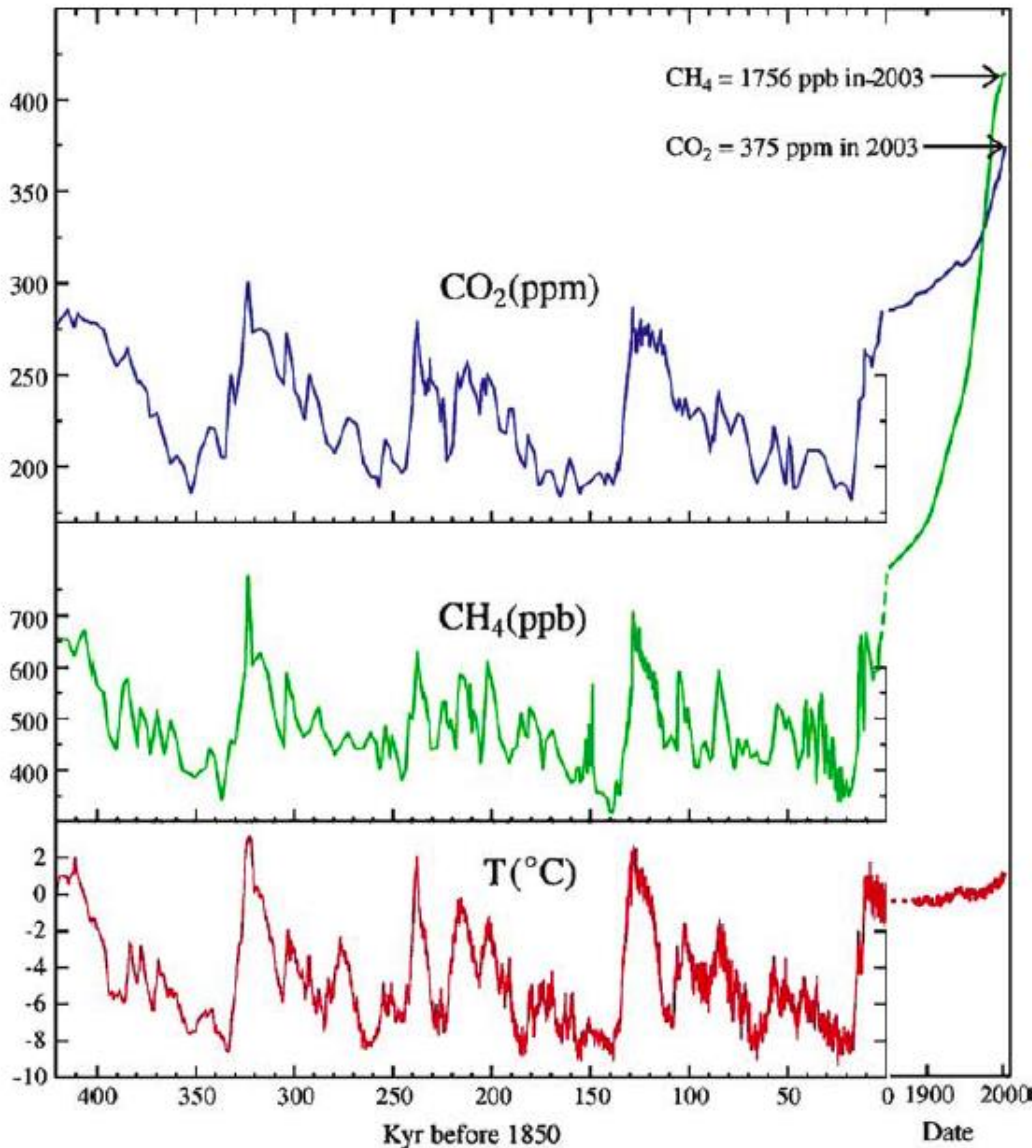


Graphic Analysis Exercise



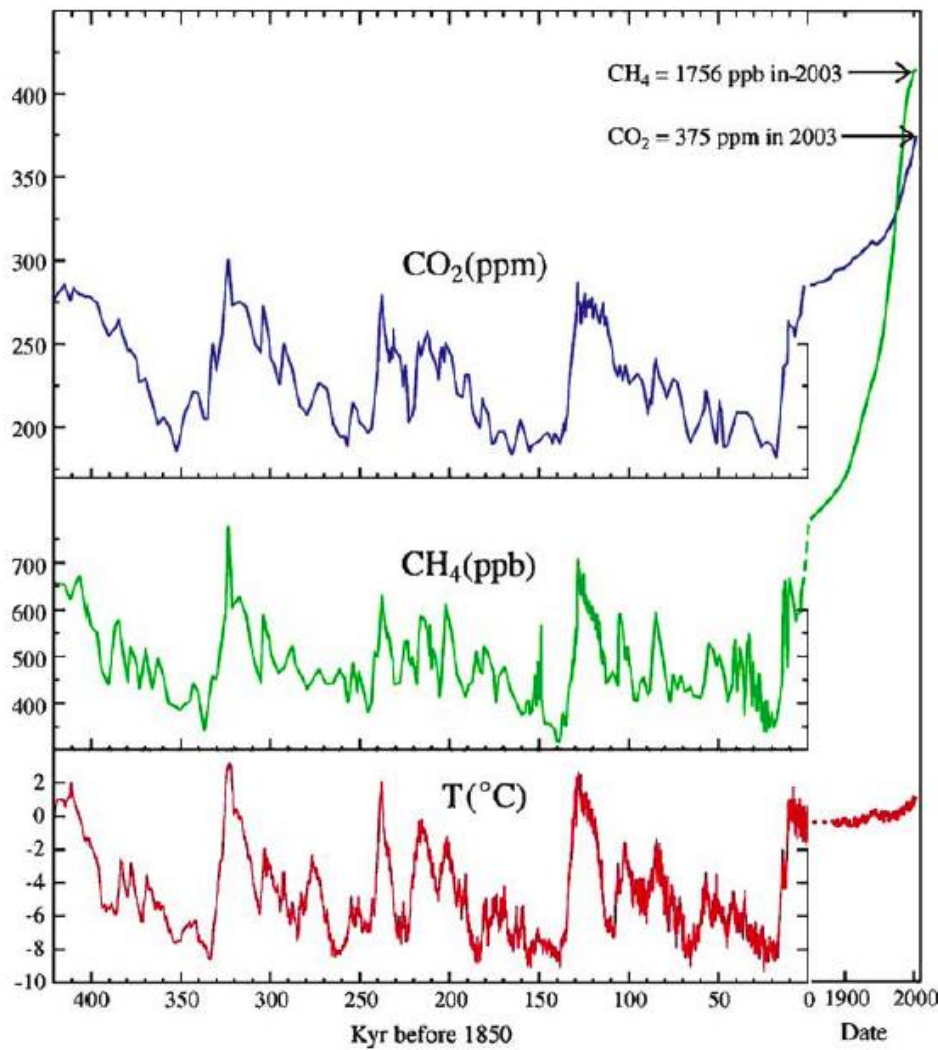
1. What are the x-y pairs in each plot (3 total)?

2. What are the units for each axis (1 x, 3 y's)?

3. What do you find interesting, important. Or otherwise noteworthy?

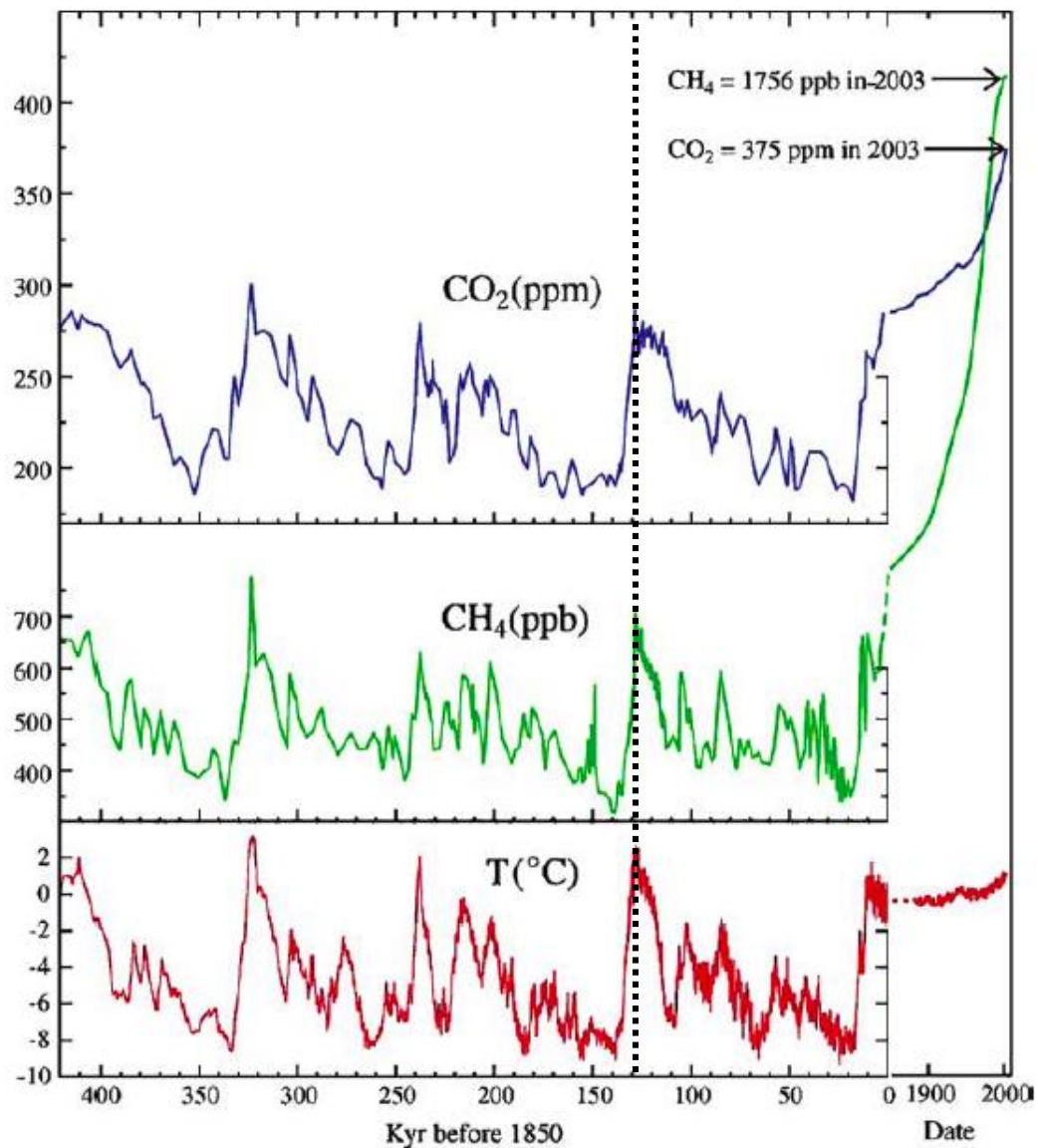
4. What do you find misleading or confusing?

Summary of Graphic Analysis

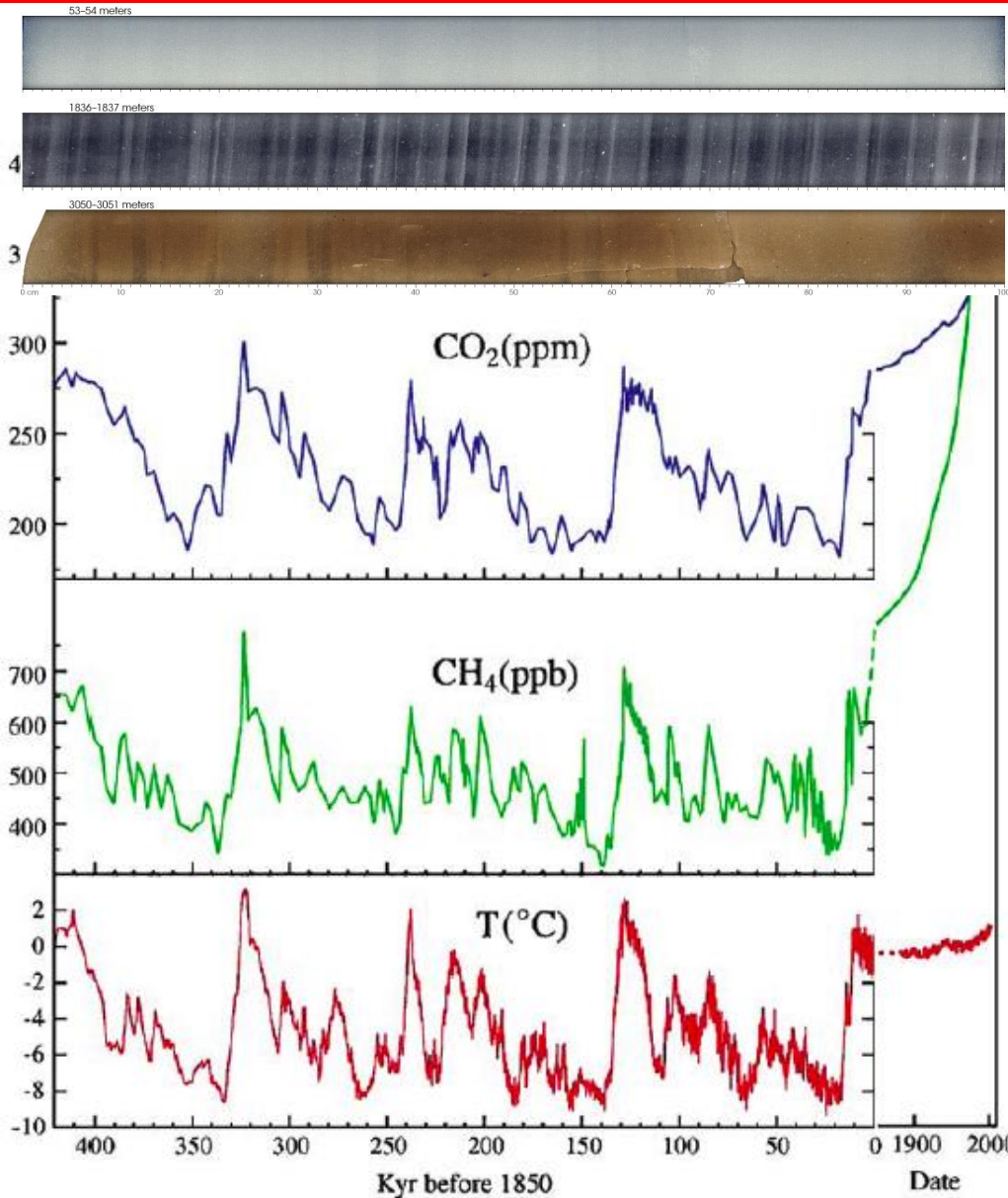


- Two different records shown: Vostok Ice Core and “modern”
- Air bubbles trapped in ice record atmospheric composition over time.
- Fraction of air that was CO₂ and CH₄ in the ice core, and T deviation from early 20th century average, shown across Antarctic ice sheet history
- Hundreds of thousands of years record compared to 100 years of modern measurements

Summary of Graphic Analysis



Summary of Graphic Analysis



These measurements were made by examining air trapped in an ice core drilled at Vostok in Antarctica.

How do you measure past air temperature in ice?

Is it fair to compare such different timescales?

How representative of climate outside of Antarctica are the ice core data?

Some definitions before going further

- Climate vs. Weather
- Climate Change (a definition)
- Global Warming

Poll Question

- Submit a word that you associate with “weather”

Poll Question

- Submit a word that you associate with “climate”

Weather, Climate, Climate Change

“It was the snowiest winter on record.
Global warming is a myth.”

“Hurricane Harvey was the largest hurricane
in decades. Global warming must be real.”

Weather vs. Climate

**“Climate is what we expect.
Weather is what we get.”**

– Mark Twain

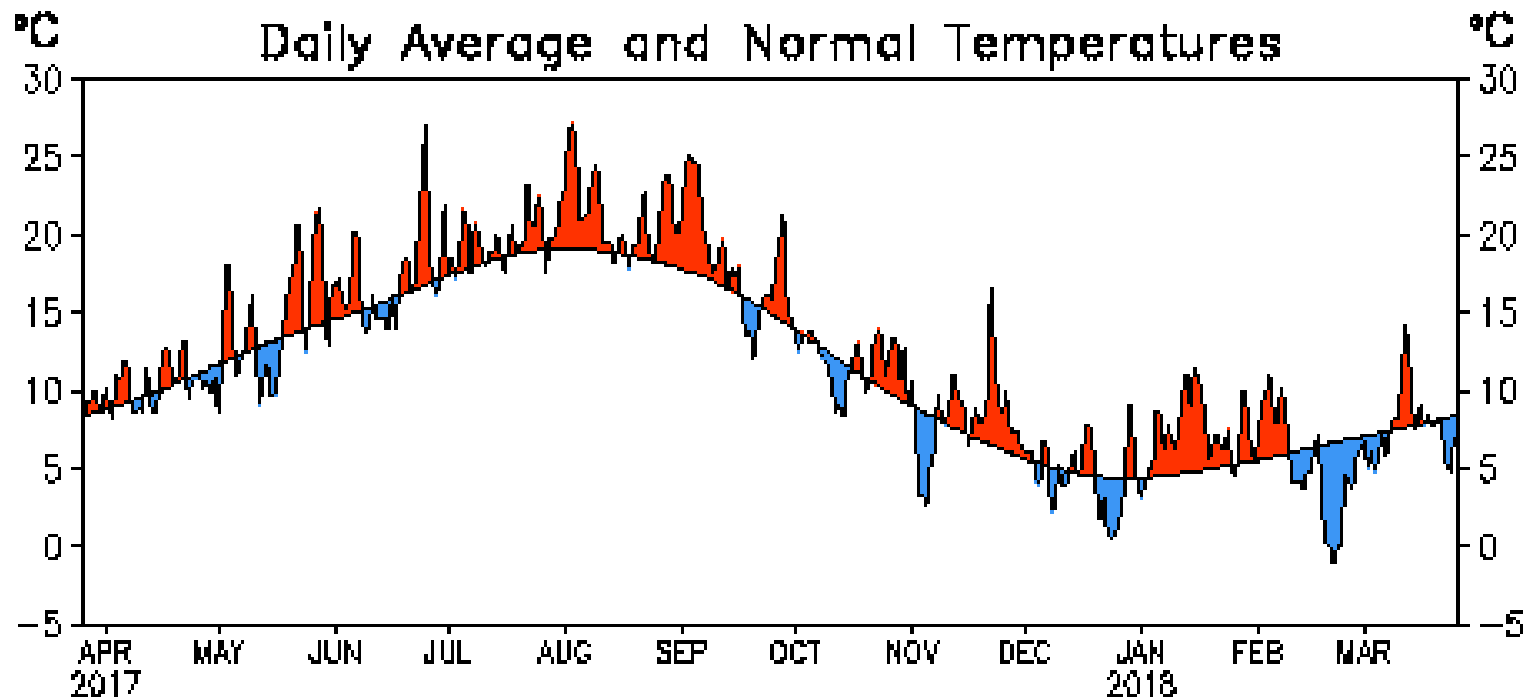
Weather and Climate Definitions

WEATHER ; min-min, hr-hr, day-day fluctuations
in ~~in~~ Earth's surface properties,
e.g. Temperature, precipitation
Clouds / sunshine, wind
→ large "variability", "random"

Climate : average of weather, over
a long time interval (decades)

Seattle Weather vs. Climate

SEATTLE—TACOMA, WASHINGTON



Red and blue indicate weather-induced *variability* around the *climatological* mean (thin **black** line)

Quick Summary

- **Weather** — minute to minute, day to day variations in temperature, precipitation, wind, cloudiness, etc.
- **Climate** — long-term average of weather (typically a few decades)
- What is climate change?
- Why is there change?
- Quantifying change

Poll Question – Weather vs Climate



Choose the statement that best describes a change in climate

 **Poll locked.** Responses not accepted.

Each day this year has had the highest daily average temperature ever recorded

4 Over the past three decades, the daily average temperature has remained constant but the difference between daytime and nighttime temperature has decreased.

Both A and B

Neither A nor B

Visual settings

Activate

Show results

Show correct

Lock

Clear results

Fullscreen

Next

Previous



Total Results: 0

Weather Change vs. Climate Change



- A single hurricane is an example of weather.
- An increase in the average number per year, or average strength is a climate question.

In the eye of Hurricane Katrina
Photo courtesy of Prof Bob Houze's group