How can we predict weather and climate events?
How do we convey information when we aren't sure about what's going to happen?

Weather Forecasts

50%
# Forecasting with Percents

## Today's Forecast for Manhattan, NY

<table>
<thead>
<tr>
<th>Time</th>
<th>Temperature</th>
<th>Precipitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning</td>
<td>45°</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cloudy, rain</td>
</tr>
<tr>
<td>Afternoon</td>
<td>44°</td>
<td>89%</td>
</tr>
<tr>
<td>Evening</td>
<td>45°</td>
<td>78%</td>
</tr>
<tr>
<td>Overnight</td>
<td>49°</td>
<td>99%</td>
</tr>
</tbody>
</table>
What do we use to make predictions?

Climate Models

→

Paper Airplanes
What You'll Need

- 3-4 paper airplanes
- Place marker
- Forecast Label

Forecast Label:

- Rain
- NO Rain
Weather Forecast
Set Up

RAIN

NO RAIN
Let Your Airplanes Fly!

For the most accurate results: stand in the same place and try to throw each airplane the same way each time.
Watch out for the Butterfly Effect

Small Changes → Big Impacts
Observe your Experiment

RAIN

NO RAIN
Make a Forecast

\[ \frac{3}{4} \] airplanes landed in "RAIN"

75% of rain
Round 2

El Niño Southern Oscillation (ENSO)
What is ENSO?

Every few years, the surface temperature of the tropical Eastern and Central Pacific Ocean moves between 3 phases:

- **Warm El Niño**
- **Average Neutral**
- **Cool La Niña**
What is ENSO?

El Niño

La Niña

Sea-surface temperature anomaly (°C)
ENSO can impact precipitation and cause droughts across the globe, impacting agriculture.

ENSO can affect wind direction and strength.

Why is ENSO Important?

1. The temperature changes in the sea surface from ENSO can change the temperature in places all over the world.

2. ENSO can impact precipitation and cause droughts across the globe, impacting agriculture.

3. ENSO can affect wind direction and strength.
ENSO Forecast Set

Up

EL NIÑO

NEUTRAL

LA NIÑA
Let Your Airplanes Fly!

For the most accurate results: stand in the same place and try to throw each airplane the same way each time.
Make a Forecast

- 75% of LA NIÑA
- 25% of NEUTRAL

3/4 airplanes landed in "LA NIÑA"
1/4 airplanes landed in "NEUTRAL"
Scientists use climate models to predict how the earth may work,

BUT...

There is always uncertainty, which is why we see "% chance" in forecasts
Why are forecasts important? Why do they help in disaster situations like a tornado or hurricane?

What does a forecast that says “50% chance of rain” mean?

Discussion Questions

1. How do you use weather forecasts in your everyday life?

2. Why are forecasts important? Why do they help in disaster situations like a tornado or hurricane?

3. What does a forecast that says “50% chance of rain” mean?
Thank you!

For more information, please contact outreach@iri.columbia.edu