Climate change

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What is CC and change? Really?

- Climate: the aggregate of weather patterns including averages and extremes, timings, etc. Therefore CC generally refers to changes in these patterns.
- Global average temperature, among other things, is a way to detect or measure these changes in patterns.
- In spite of the controversies and criticisms from individuals and organizations alike, one fact is beyond doubt, that our climate is changing and we are the ones to be held responsible.
Everything is related- greenhouse emissions, CO$_2$ concentrations and temperature increase!

Global temperatures are now rising @ 0.18°C/decade
The Other Symptoms of climate change

- Erratic weather patterns
- Rising sea levels
- Increased forest fires and desertification
- Melting of polar ice caps and glaciers
- Changes in crop productivity
Glacier melting - example from Rongbuk glacier, Tibet
Glacial Lake Outburst Flood (GLOF) - A ticking timebomb

• Formation of lakes caused by melting glaciers and their gradual increase in size pose serious flood threats for downstream areas.

• Many glacial lakes in Sikkim have witnessed size increase due to melting glaciers and even famous wetlands like one of the lakes in the Gurudongmar complex, has increased five times in size since 1965.
Ecological impacts of climate change

• Any change in climate automatically affects the ecosystem and all living beings dependent on it.

• As a result of climate change, species and ecosystems are experiencing changes in:
  – ranges
  – timing of biological activity
  – growth rates
  – relative abundance of species
  – cycling of water and nutrients
  – the risk of disturbance from fire, insects, and invasive species
### Ecological impacts of climate change-II

<table>
<thead>
<tr>
<th>Range shifts</th>
<th>Biological calendar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mosquitoes</td>
<td>Irregular flowering/fruiting</td>
</tr>
<tr>
<td>Snakes and frogs</td>
<td>Slow growth</td>
</tr>
<tr>
<td>Crops</td>
<td>Loss in productivity</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relative abundance</th>
<th>Other potential impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominance of heat resisting species</td>
<td>More forest fires</td>
</tr>
<tr>
<td>Loss of species diversity</td>
<td>Spread of invasive species</td>
</tr>
<tr>
<td>Phenomenon and Direction of Trend</td>
<td>Likelihood that trend occurred in 20th Century</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Warmer and fewer cold days and nights over most land areas</td>
<td>Very likely</td>
</tr>
<tr>
<td>Warmer and more frequent hot days and nights over most land areas</td>
<td>Very likely</td>
</tr>
<tr>
<td>Warm spells / heatwaves: frequency increases over most land areas</td>
<td>Likely</td>
</tr>
<tr>
<td>Heavy precipitation events: frequency (or proportion of total rainfall from heavy falls) increases over most areas</td>
<td>Likely</td>
</tr>
<tr>
<td>Area affected by droughts increases</td>
<td>Likely in many regions since 1970s</td>
</tr>
<tr>
<td>Intense tropical cyclone activity increases</td>
<td>Likely in many regions since 1970s</td>
</tr>
<tr>
<td>Increased incidence of extreme high sea level</td>
<td>Likely</td>
</tr>
</tbody>
</table>
How does climate change affect our health?

### Health effects
- Temperature-related illness and death
- Extreme weather-related health effects
- Air pollution-related health effects
- Water and food-borne diseases
- Vector-borne and rodent-borne diseases
- Effects of food and water shortages
- Effects of population displacement

### Human exposures
- Regional weather changes
  - Heat waves
  - Extreme weather
  - Temperature
  - Precipitation

### Modulating influences
- Contamination pathways
- Transmission dynamics
- Agroecosystems, hydrology
- Socioeconomics, demographics

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**CLIMATE CHANGE**
What can ordinary citizens do?

- **R** Reduce, Reuse, Recycle, Raise awareness
- **S** Save energy
- **V** Stop forest loss
- **V** Volunteer
- **P** Promote renewable energy
- **P** Plant trees
Climate change is real, it is happening right now. It is the most urgent threat facing our entire species, and we need to work collectively together and stop procrastinating.

Leonardo DiCaprio
2016 Oscar acceptance speech