Tackling Climate Change with Machine Learning & other ways

Presented by –

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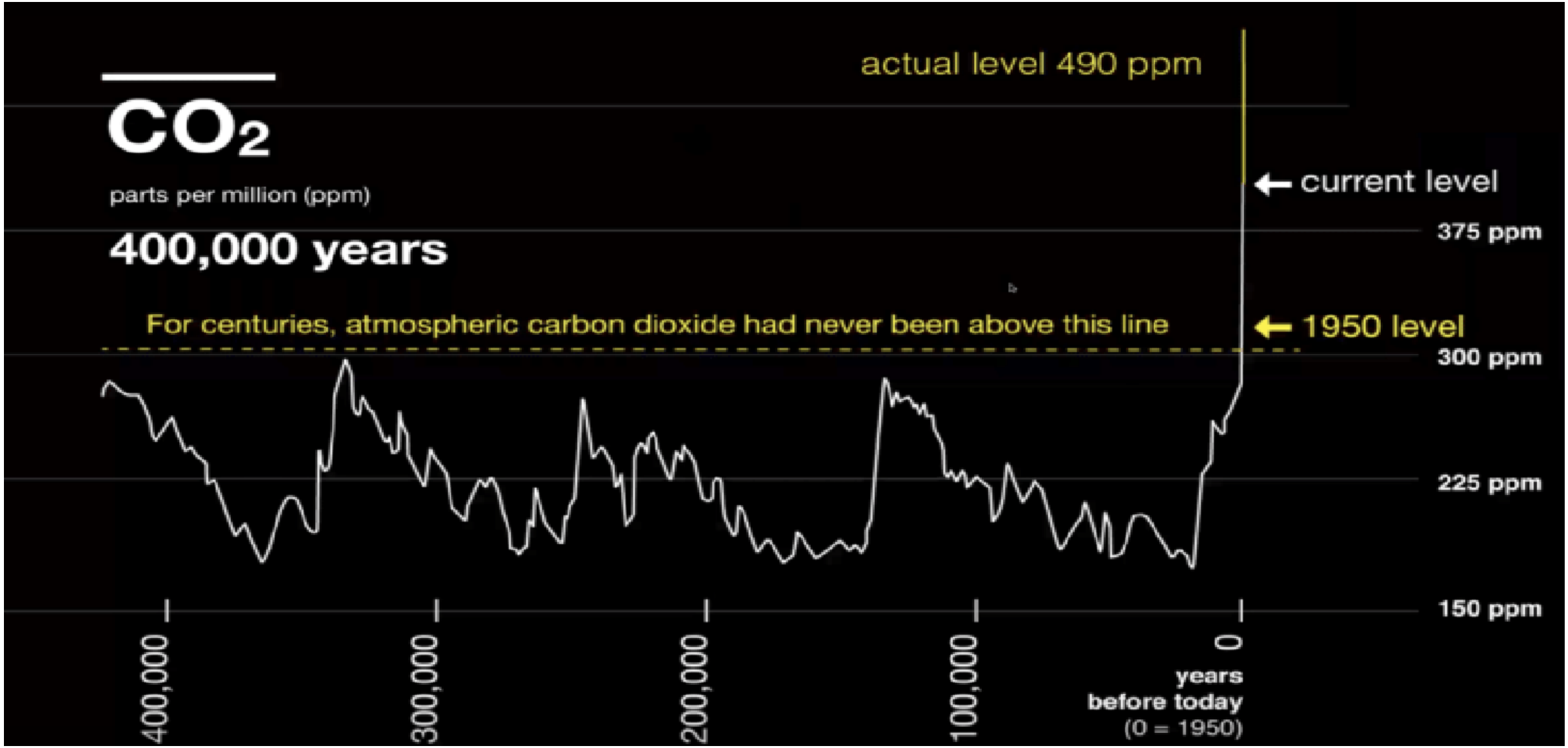
Agenda

- Climate crisis
- What can we do using ML ?
- Mitigation
- Adaption
- Project Drawdown
- References

We've never lived on a planet like this



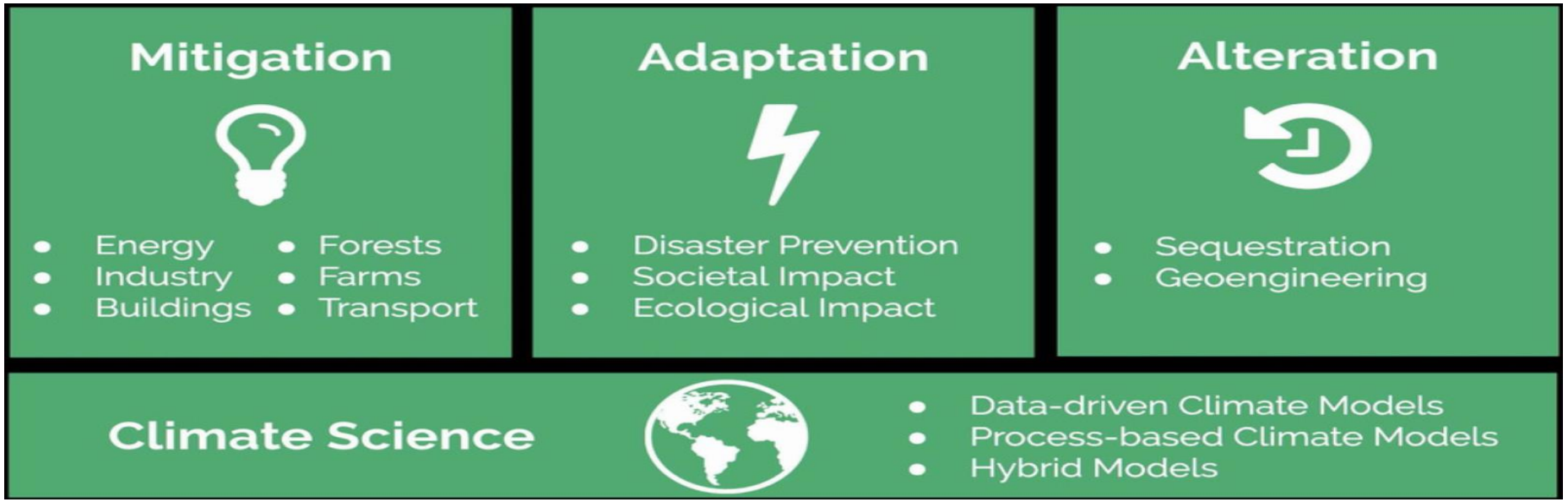
rricane Florence. *Pacific Standard*, September 21, 2018.

Climate crisis…

Climate Crisis – We're running out of carbon budget!

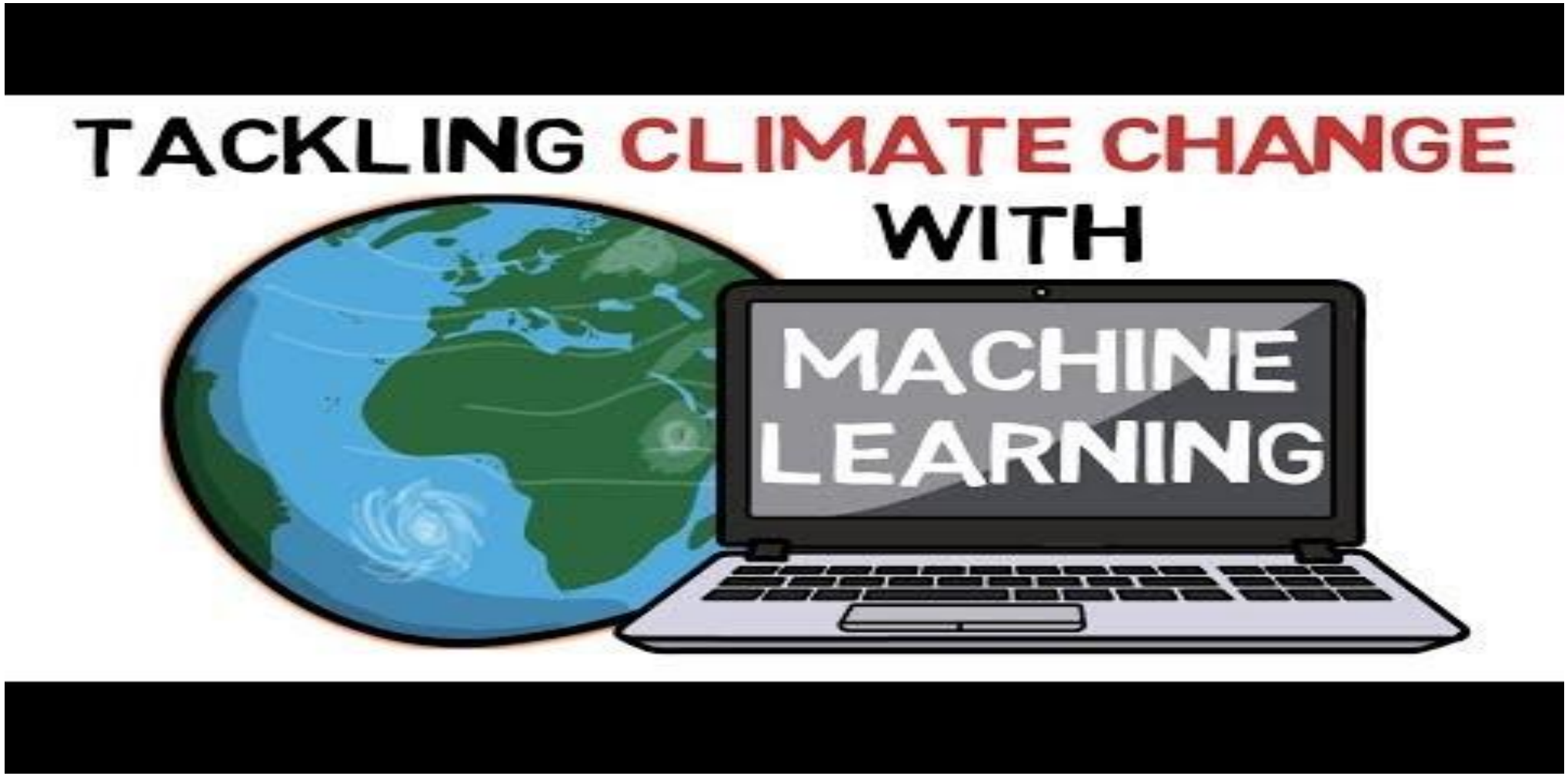
What can we do using ML?

- Tackling climate change requires both **mitigation** and **adaptation**.
- **ML can be an invaluable tool both in reducing greenhouse gas emissions and in helping society adapt to the effects of climate change**.
- There are problems in this space where AI/ML can have a major impact.

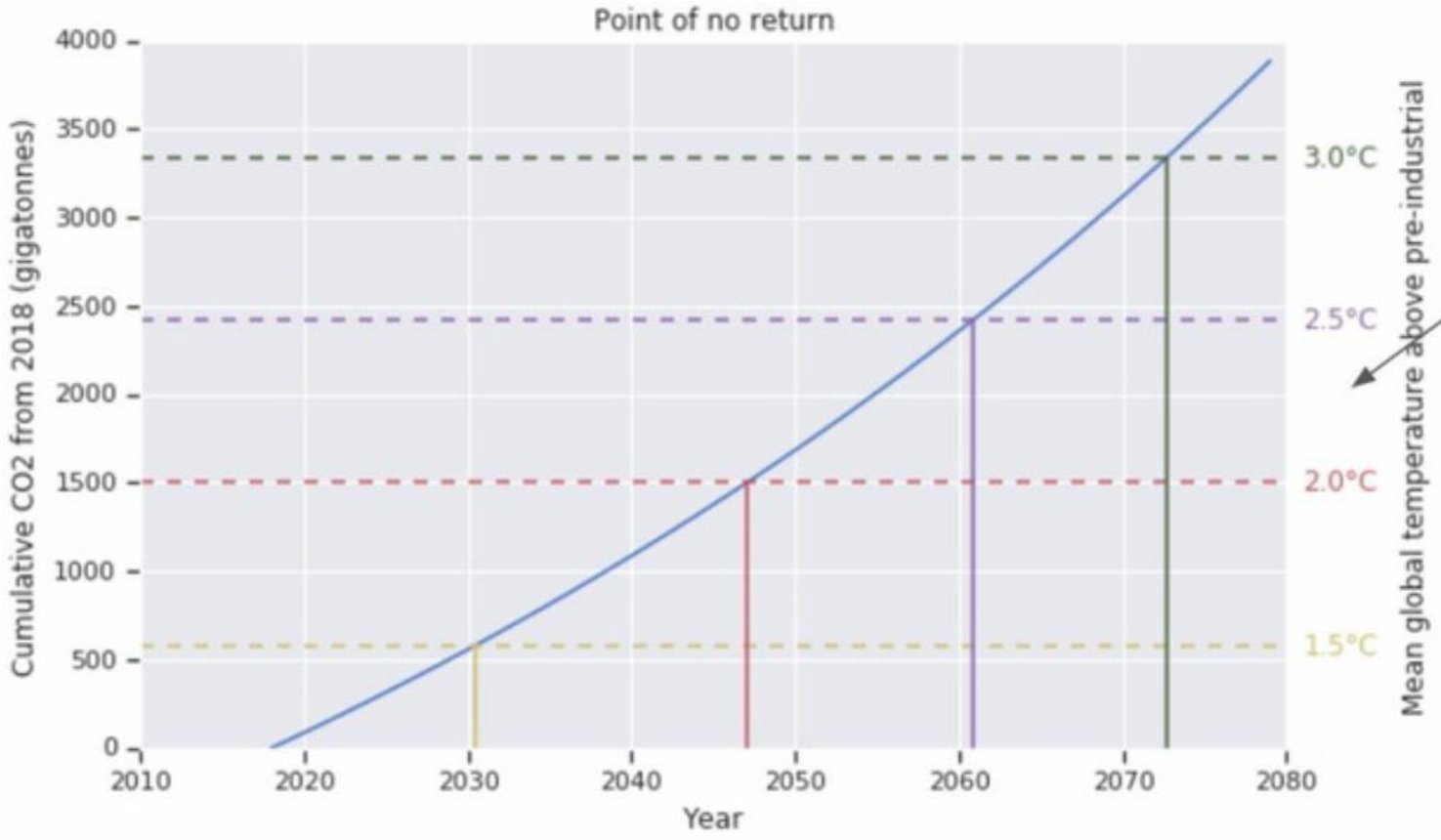


Mitigation

- Video - https://www.youtube.com/watch?v=pHdv4o0mfd0



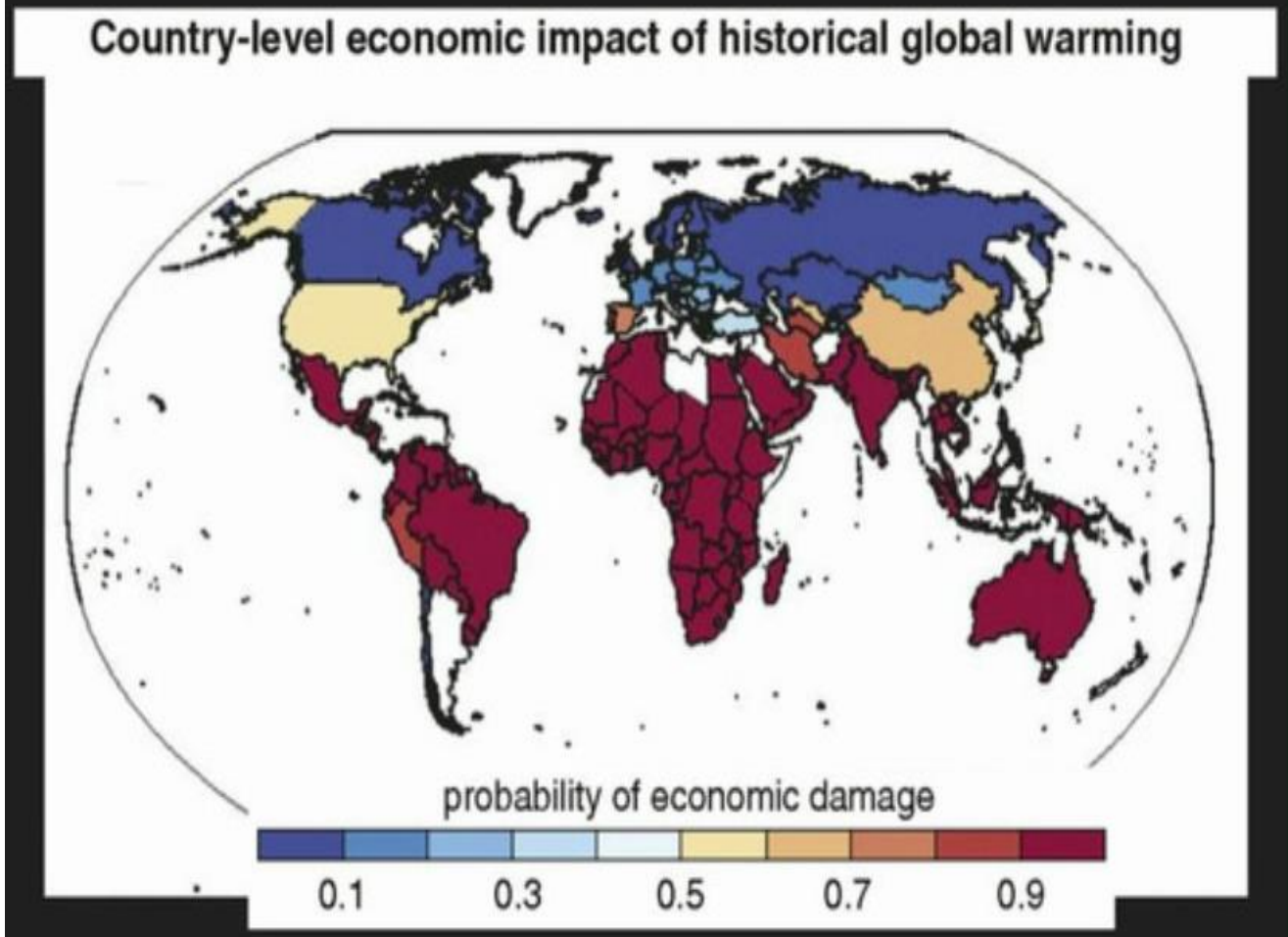
Adaption



Can ML help make this less damaging?

Adaption …

Economic impact



Ecological impact

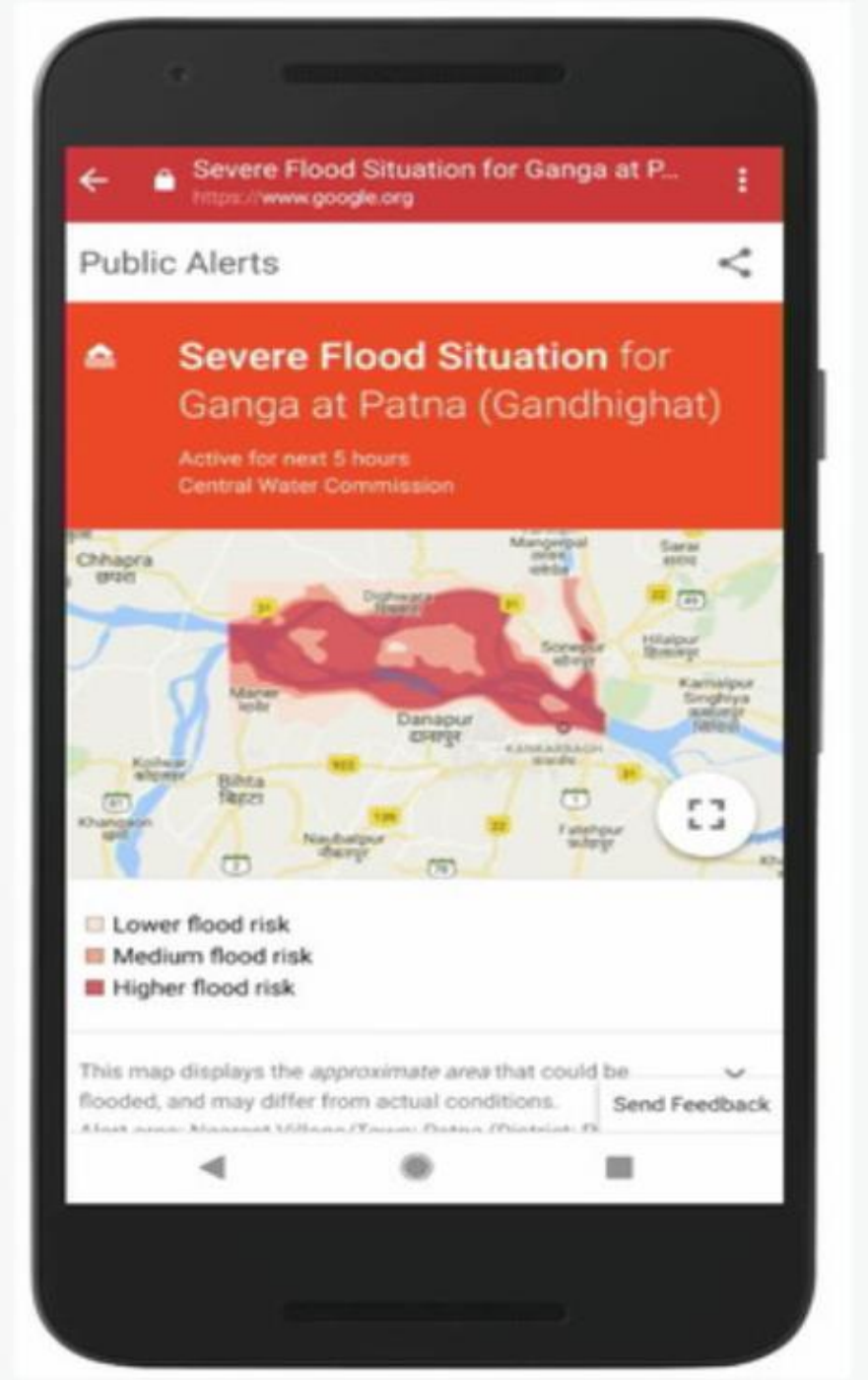
Detect wildlife from camera-trap videos. This will help monitor endangerment and extinction.

Example: Flood Forecasting

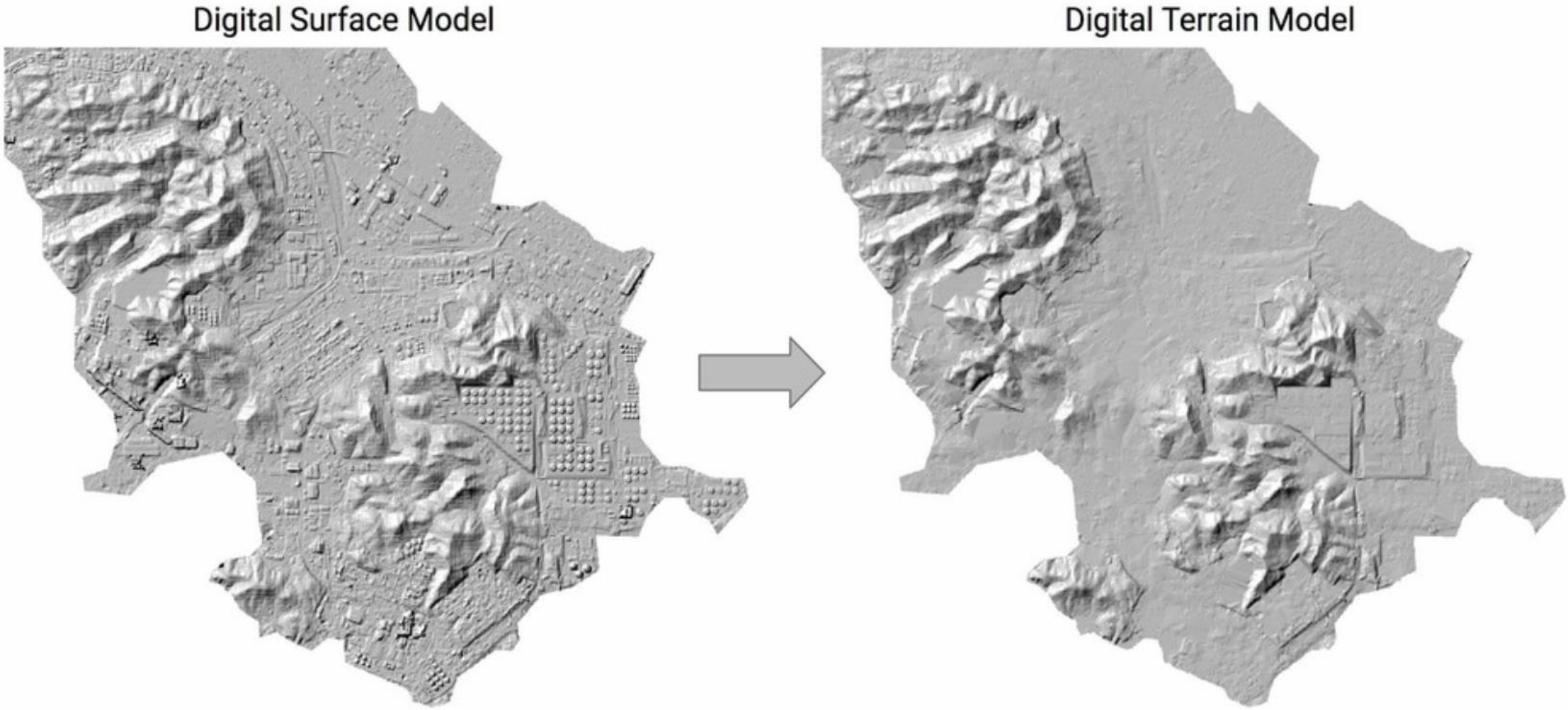
- Floods are bad now
  - $9.8B Annual damage
  - Affects 250M people/year

Will get worse at higher temperature.

Use ML to better predict floods.



Use ML to derive high-resolution maps



Project Drawdown

- **Drawdown: 100 solutions to reverse global warming**
- https://www.drawdown.org

TOP 20

RANK	SOLUTION	SECTOR	REDUCED CO2
1	**Refrigeration**	Materials	89.74 GT
2	**Wind Turbines (Onshore)**	Energy	84.60 GT
3	**Reduced Food Waste**	Food	70.53 GT
4	**Plant-Rich Diet**	Food	66.11 GT
5	**Tropical Forests**	Land Use	61.23 GT
6	**Educating Girls**	Women and Girls	51.48 GT
7	**Family Planning**	Women and Girls	51.48 GT
8	**Solar Farms**	Energy	36.90 GT
9	**Silvopasture**	Food	31.19 GT
10	**Rooftop Solar**	Energy	24.60 GT
11	**Regenerative Agriculture**	Food	23.15 GT
12	**Temperate Forest**	Land Use	22.61 GT
13	**Peatlands**	Land Use	21.57 GT
14	**Tropical Staple Tree Crops**	Food	20.19 GT
15	**Afforestation**	Land Use	18.06 GT
16	**Conservation Agriculture**	Food	17.35 GT
17	**Tree Intercropping**	Food	17.20 GT
18	**Geothermal**	Energy	16.60 GT
19	**Managed Grazing**	Food	16.34 GT
20	**Nuclear**	Energy	16.09 GT

TOP 20

Electricity
is only
5 of top 20

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TOP 20

Food system
is 8 of top 20

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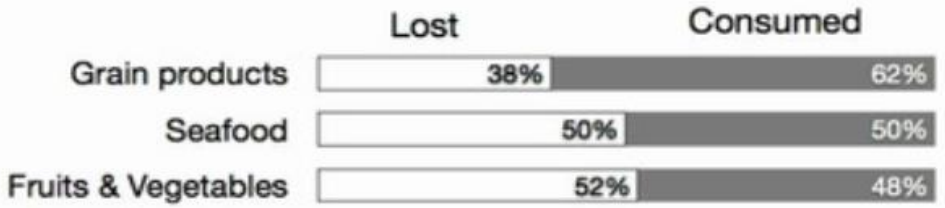
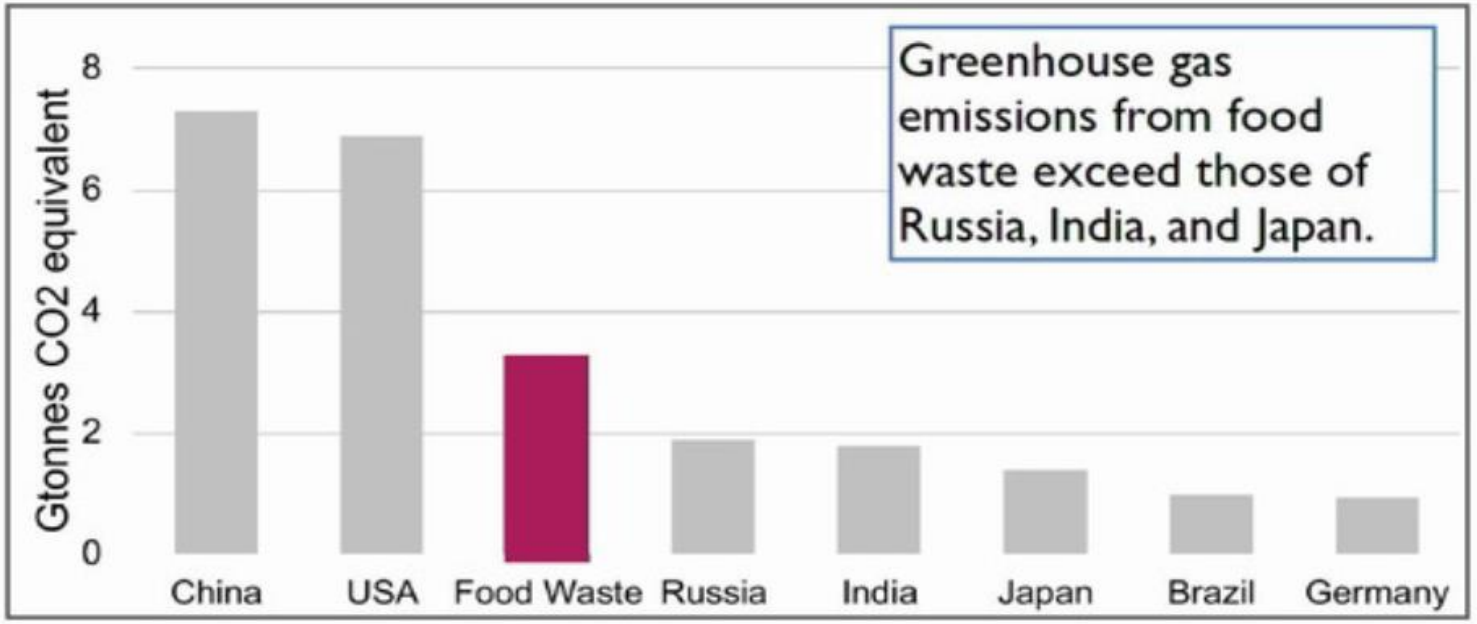
Food Waste & impact on Environment

- About 30-50% of food produced worldwide is wasted, a $165B loss to the US economy.



- Food waste consumes 21% of freshwater [Hoekstra et al., 2012] and 18% of all available cropland [Vermulen et al., 2012].



TOP 20

Land Management is 4 of top 20

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TOP 20

Land + Food
is 12 of top 20

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TOP 20

Refrigeration is the top solution

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2020-2050

TOP 20

Women & girls:
when combined,
it is top solution.

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References

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- https://www.tmrow.com/climatechange
- https://electricitymap.org