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Outer Space Activities**  
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## Overview

UNICEF Office of Innovation Focus

## What we are doing now

### - using remote sensing data

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# UNICEF Innovation

UNICEF: 70 years  
for every child

Seventy years ago, UNICEF was founded to meet the critical needs of children whose lives had been torn apart by World War II. It did not matter in which country those children lived or what role that country played in the war. What mattered was reaching the children at greatest risk and in greatest need.

UNICEF brought these children humanitarian support and long-term assistance. And it also brought hope to children who had endured the horrors of war and displacement. Hope for a more normal childhood. Hope for a better future.

Seventy years on, UNICEF continues to play a significant part in delivering humanitarian aid to the most vulnerable children in the world. We have the potential to make a difference.

*"The stirrings for change, aided by a growing international conscience and awareness of the need to share materials and experience, has led for the first time to the possibility that most of the children of the world can join the present fortunate ones in a chance for life, health, productivity, and happiness."*

— Eleanor Roosevelt, 1946



UNICEFINNOVATION

@unicefinnovate

# Big + Complex Problems

urbanization

migration

climate change

vanishing jobs

pandemics

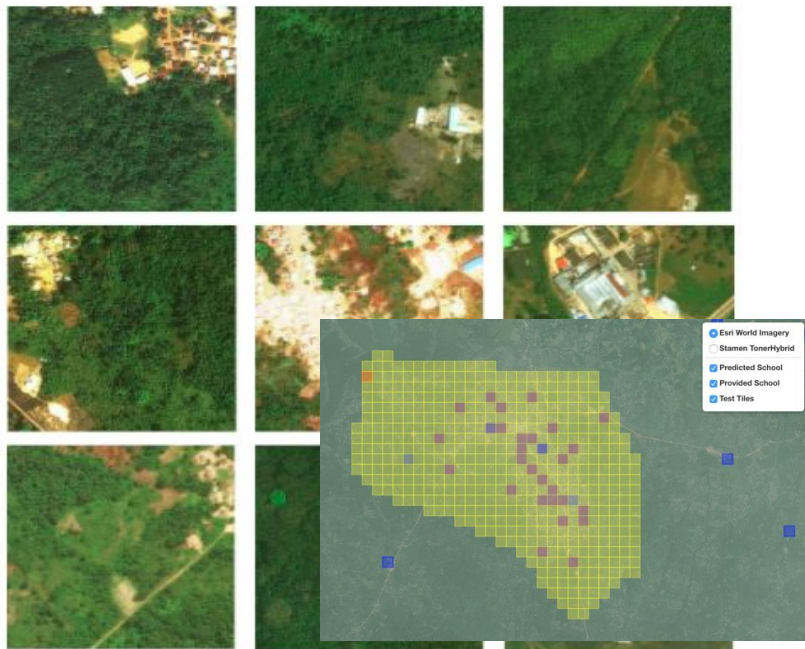
# What we're doing now: Big Data + Data Science



**Can we map all the schools in the world?**

# School mapping in the world

## *Deep Learning for automatic school detection*



- Ground truth (Liberia) as training data
- Very high resolution satellite imagery
- Deep learning algorithms for automatic detection
- Preliminary results for Liberia with more than 75 % overall accuracy.
- Collaborators - Oxford University , UCSD, Development Seed, UNOSAT, PAHO



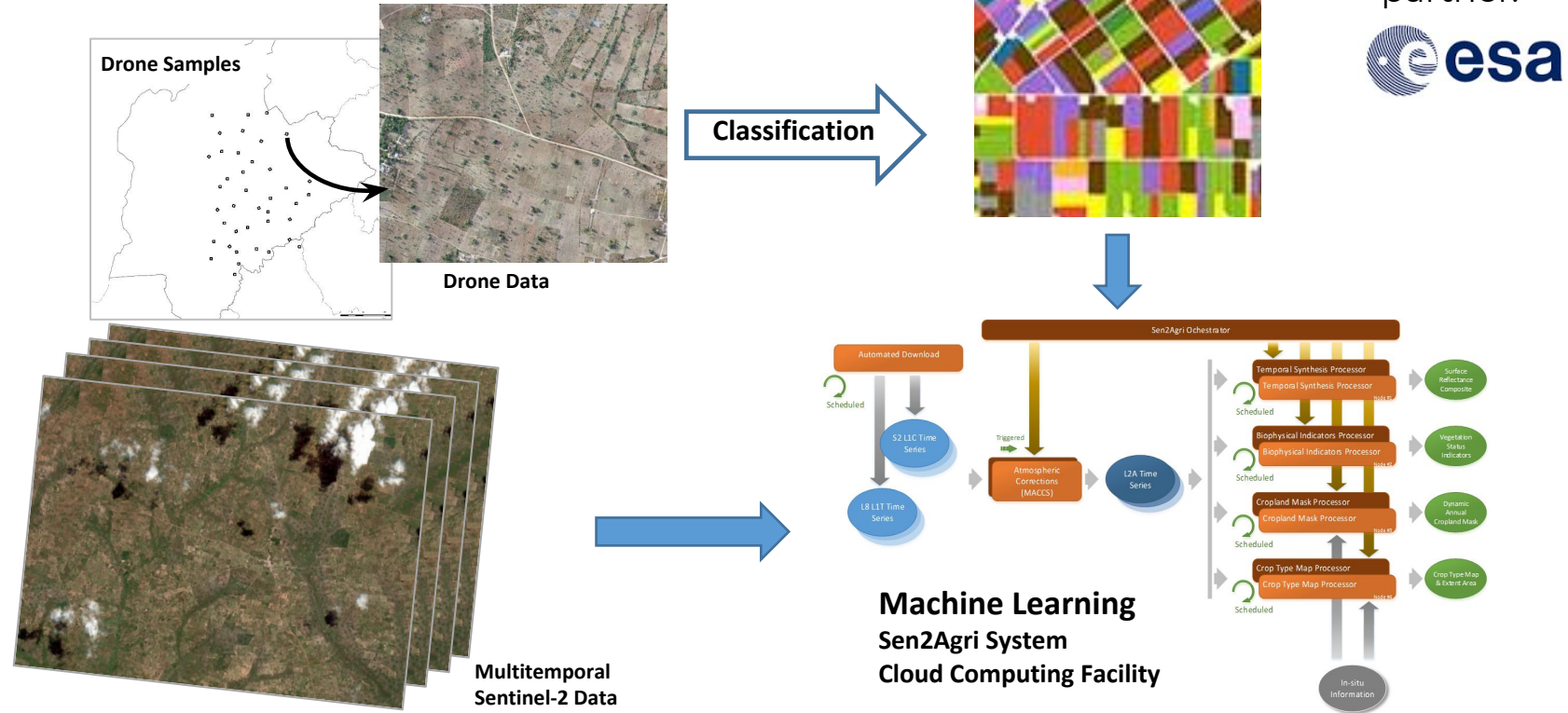


# Crop type mapping using drone and satellite imagery



# Crop type mapping with WFP and FAO

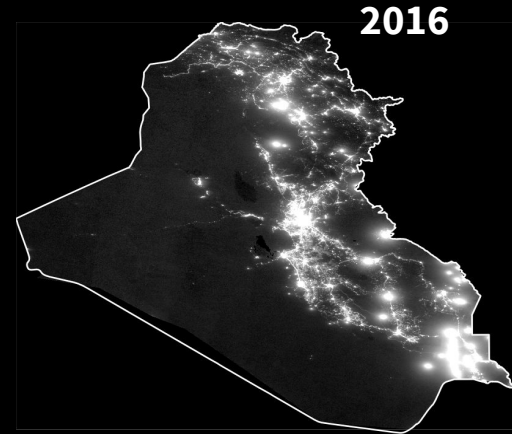
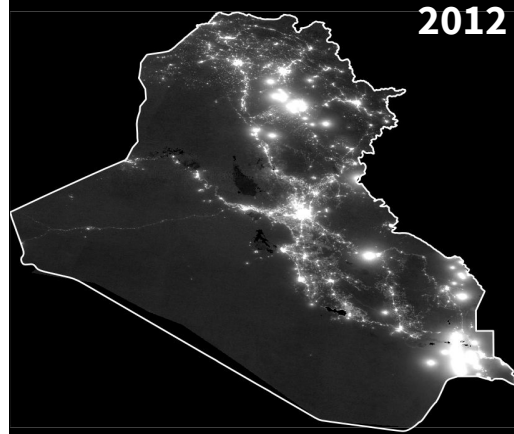
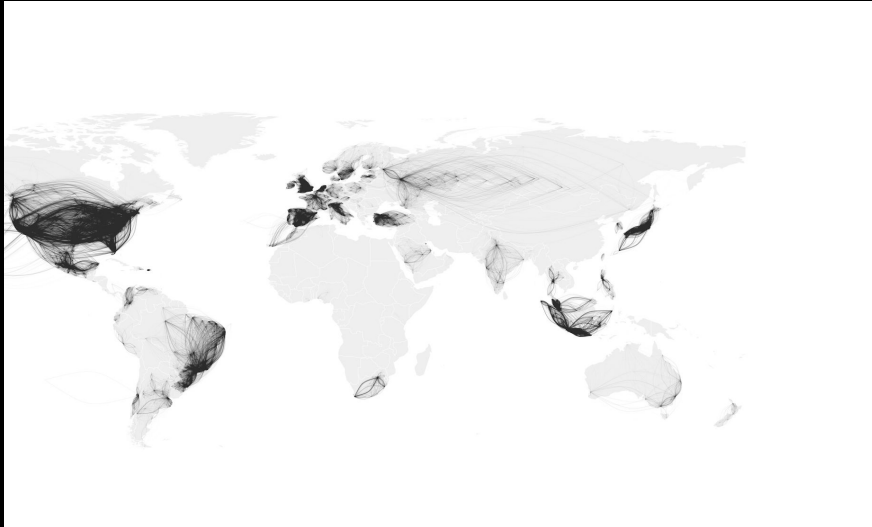
- Funded by UN Development Group
- Drone based sampling of ground truth used to train high-resolution, high-frequency satellite data (Sentinel-2) in order to scale up mapping to country sized areas



# Mapping vulnerabilities

# Mapping poverty in Iraq

Mapping poverty with mobile data and satellite imagery



# Informal settlements monitoring

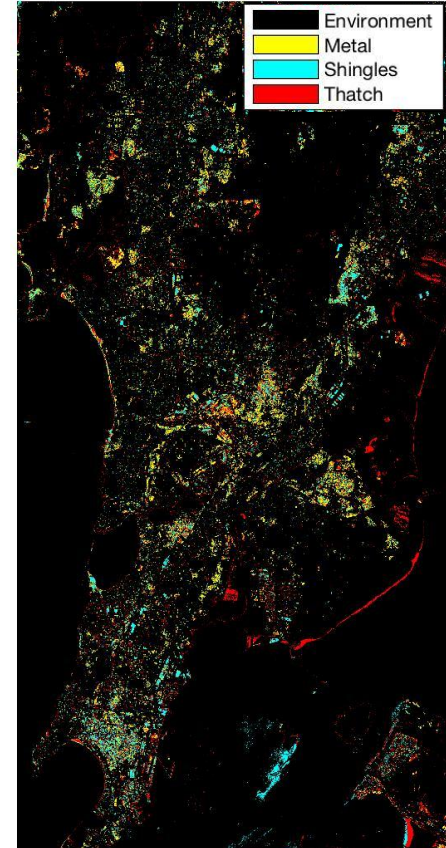
Sentinel-2



Ground Truth



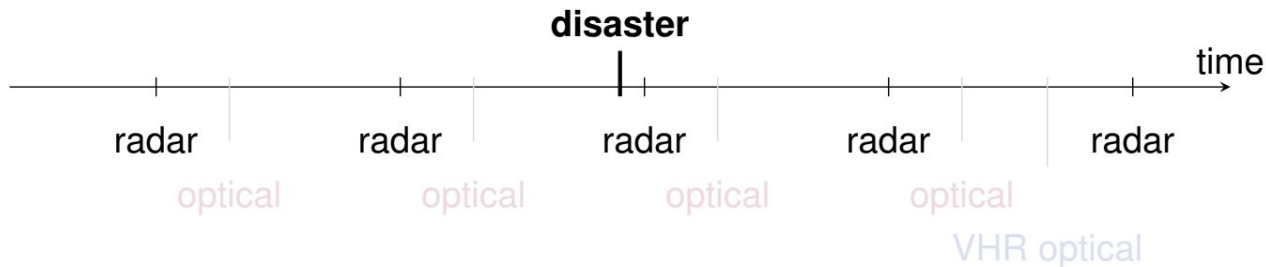
Prediction



Mumbai, India

# Disaster impact mapping

Deep learning algorithms to combine multi resolution, multi temporal and multi source imagery to map damages by disasters

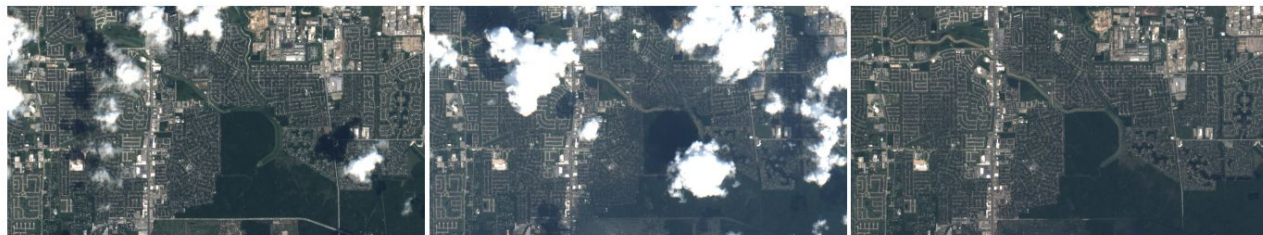


coherence pre

coherence post



coherence RGB pre & post



pre

during

post

# Thanks

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<http://unicefstories.org/magicbox>

[www.unicefinnovationfund.org](http://www.unicefinnovationfund.org)