



**Radiant Earth
Foundation**
EARTH IMAGERY FOR IMPACT



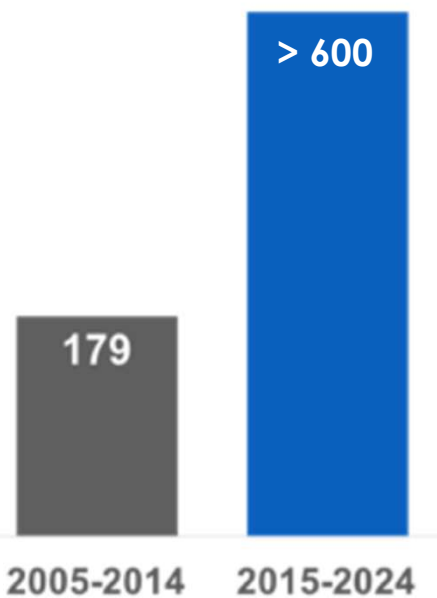
MACHINE LEARNING IN EARTH OBSERVATION

KEVIN BOOTH

GEOSPATIAL DEVELOPER



Earth Observation Satellites



Satellite



Aircraft



Drone

Dramatic increase in imagery supply



Cloud Computing



Machine Learning

Rapid Innovation



New Solutions

CHALLENGE

OPPORTUNITY

SOLUTIONS



MISSION

Empowering organizations and individuals globally with open Earth observation training data, standards and tools to cultivate a global community focused on machine learning and Earth observations to meet the world's most critical challenges.



VISION

Leveraging machine learning and Earth observation for positive global impact



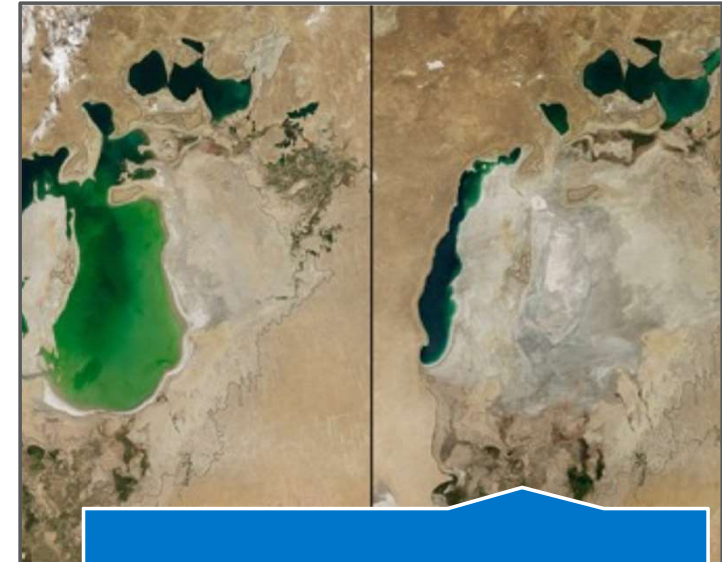
What We Do



ML
Open Training Data and
Models



Community of Practice,
Standards and Best
Practices



EO Information and
Awareness



Benchmark for Computer Vision

- ▶ 14 M annotated images including 1 M with object bounding boxes.
- ▶ 20 K categories of objects
- ▶ Open access
- ▶ Annual competition since 2010





Benchmark Geospatial Training Data

BigEarthNet

- ▶ Sentinel-2 image patches annotated by multiple land-cover classes
- ▶ Images are selected across 10 EU countries.

Chesapeake Land Cover

- ▶ Labels: LC from Chesapeake Bay Conservancy (high-res), Building footprints from Microsoft Bing (high-res), LC from USGS NLCD 2011 (low-res)
- ▶ Imagery: NAIP (high-res aerial), Landsat 8 (low-res multi-spectral imagery)

SpaceNet

- ▶ Labels: Road and buildings from ten cities globally.
- ▶ Imagery: World-View from Maxar (high-res)



Challenges in Geospatial ML

Geospatial Training Data Catalogs:

- ▶ Lack of Geo-Diversity
- ▶ Scarce data sources
- ▶ Data Accessibility
- ▶ Inter-Operability
- ▶ Machine learning-readiness

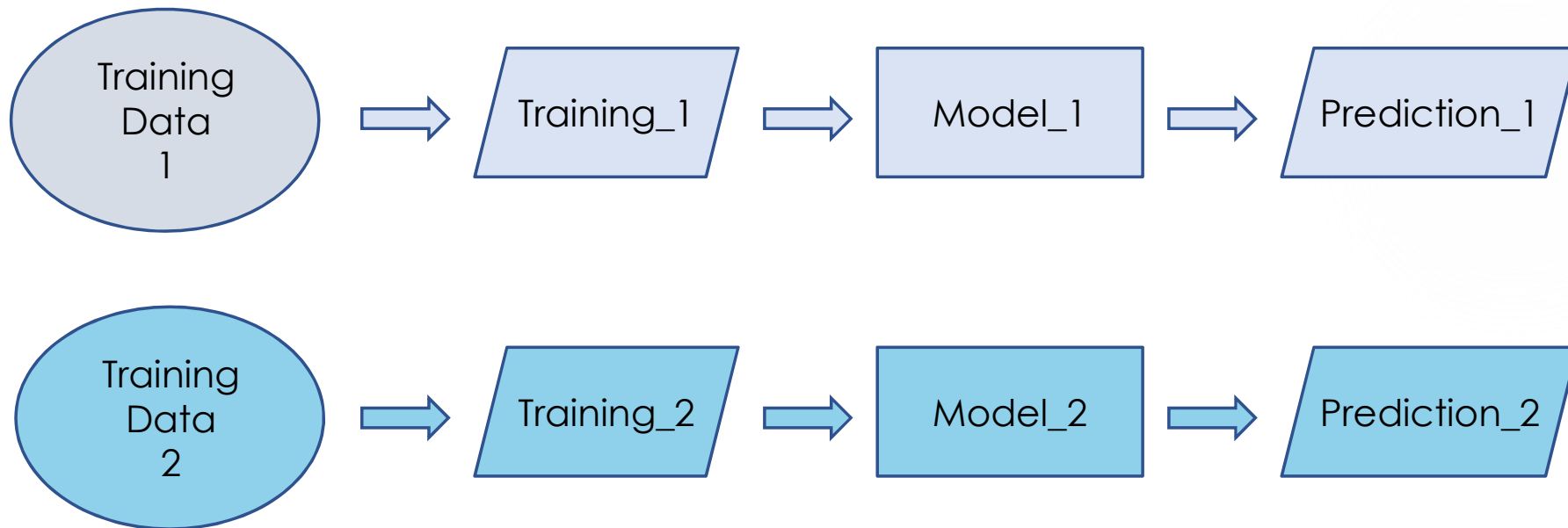


Result of Gaps in Training Data Catalogs:

- ▶ Biased or incorrect results
- ▶ Inability to capture wide range of possible outcomes in space and time

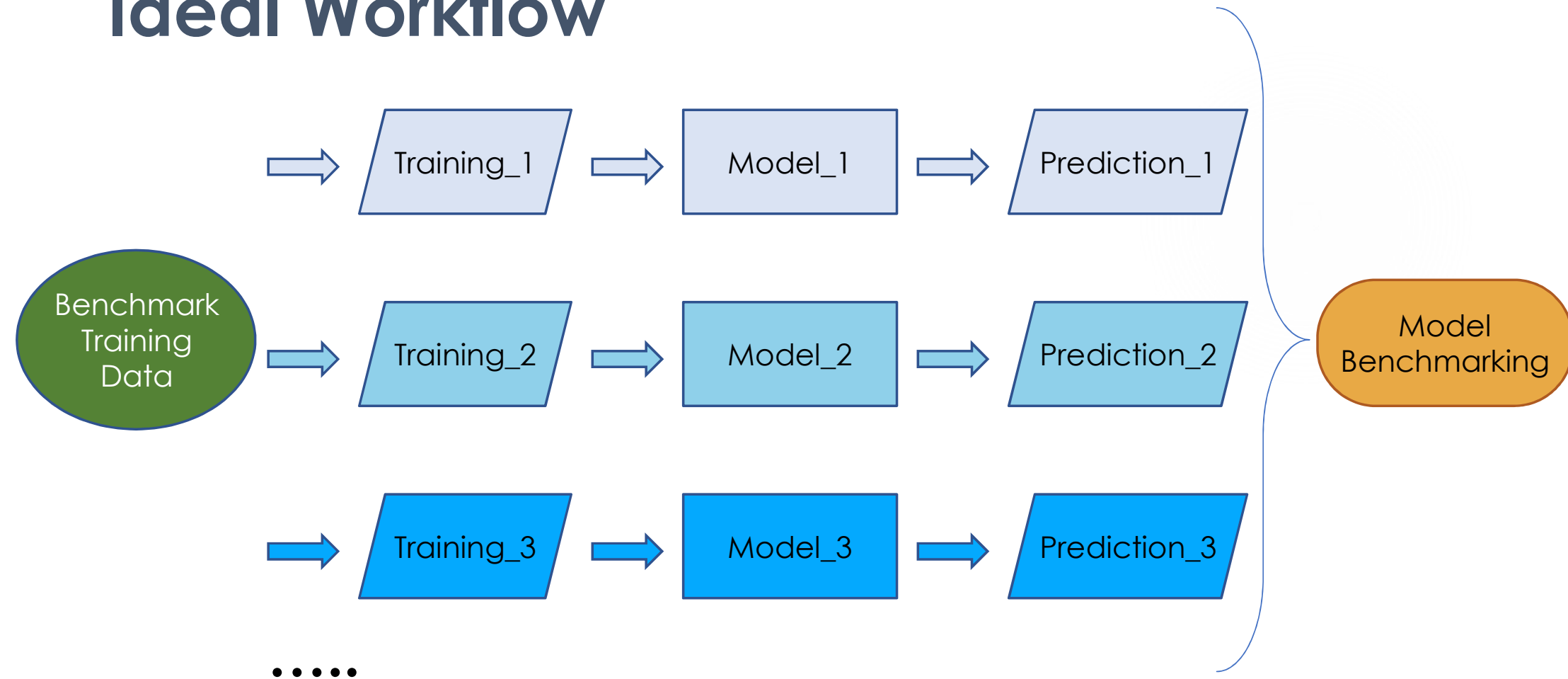


Existing Workflows





Ideal Workflow





A community focused on advancing the application of EO to solve challenges in the Global South using ML techniques

Open Source ML “Hub”
for EO

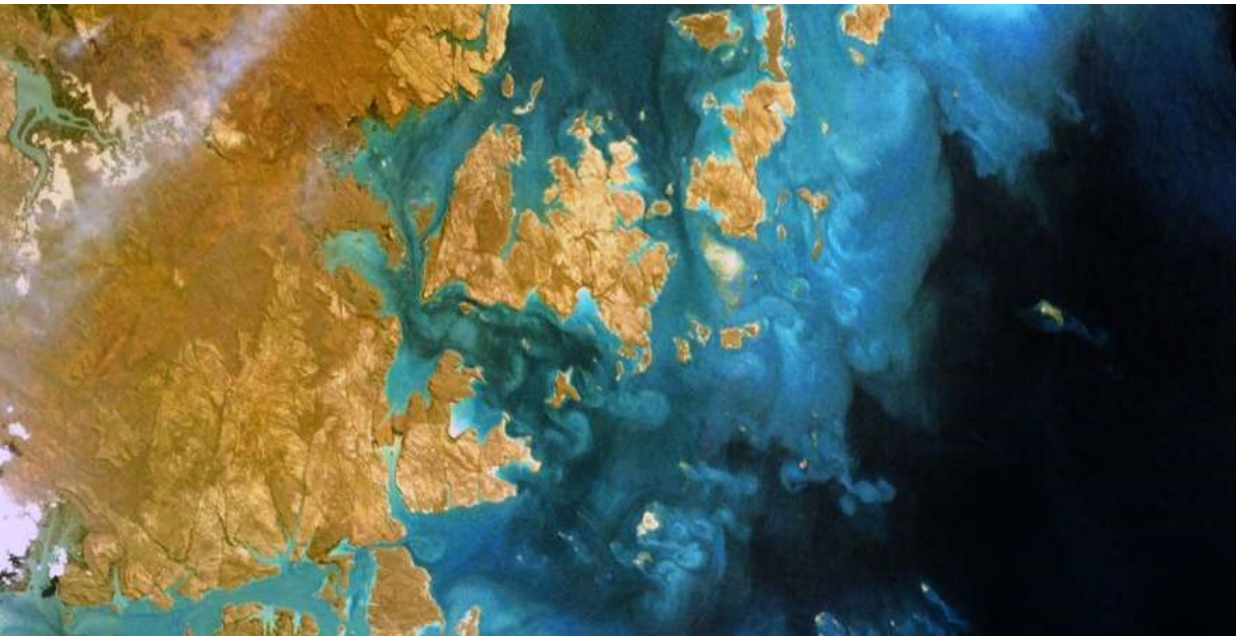
Educate & Inform

Training Data,
Models &
Standards

Ground Truth
Labels

Technical
Groups,
Fellowships,
Convenings

Promotion of
datasets,
Educate on
Innovation



Radiant Earth Foundation

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Join the Community

 hello@radiant.earth

 [OurRadiantEarth](https://twitter.com/OurRadiantEarth)

 www.radiant.earth
www.mlhub.earth

 github.com/radiantearth