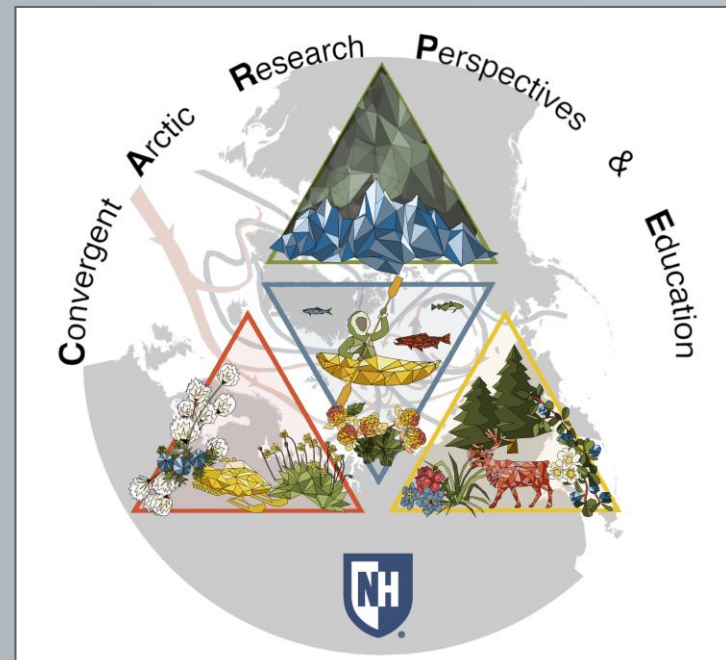


# Spectral Markers of Destruction: NDVI and NDBI-Based Assessment of Environmental Warfare in the Gaza Strip

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### Remote Environmental Monitoring of Conflict & The War in Gaza:

**Armed Conflict & The Environment:**

- Armed conflict has the potential to reshape entire ecosystems and introduce **significant** and **observable** environmental impacts.
- Limited **accessibility** and **dangerous conditions** make it difficult to evaluate environmental impacts during periods of armed conflict.
- During the 7<sup>th</sup> October 2023 Conflict in Gaza, **prolonged sieges, artillery shelling, and direct combat** have drastically changed the landscape in Gaza.

**Research Objective & Key Metrics:**

- Utilize remote sensing spectral indices and land use typologies to analyze damage to vegetation & infrastructure across the active conflict period in Gaza

**Normalized Difference Vegetation Index (NDVI)**  
Vegetation

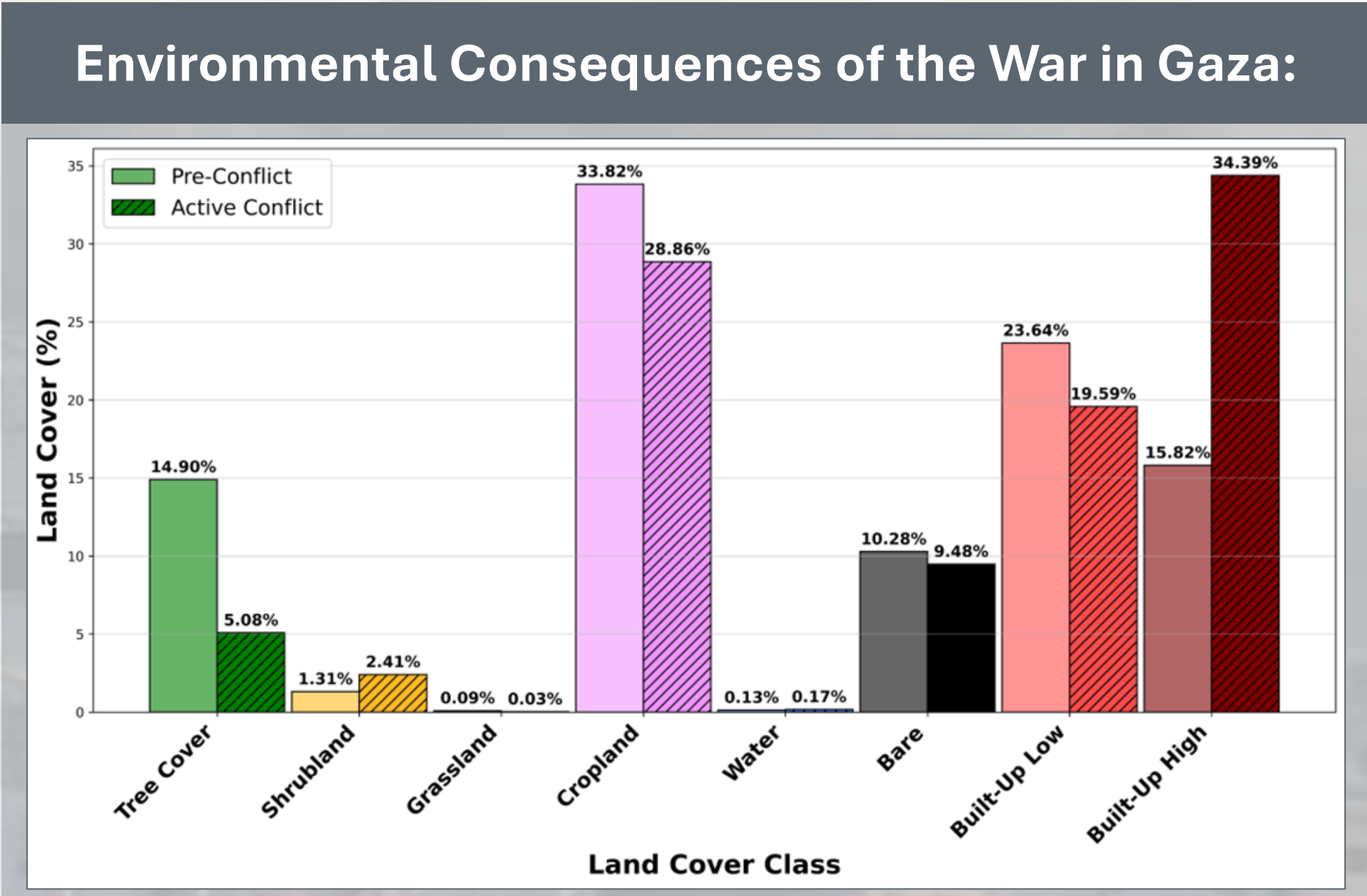
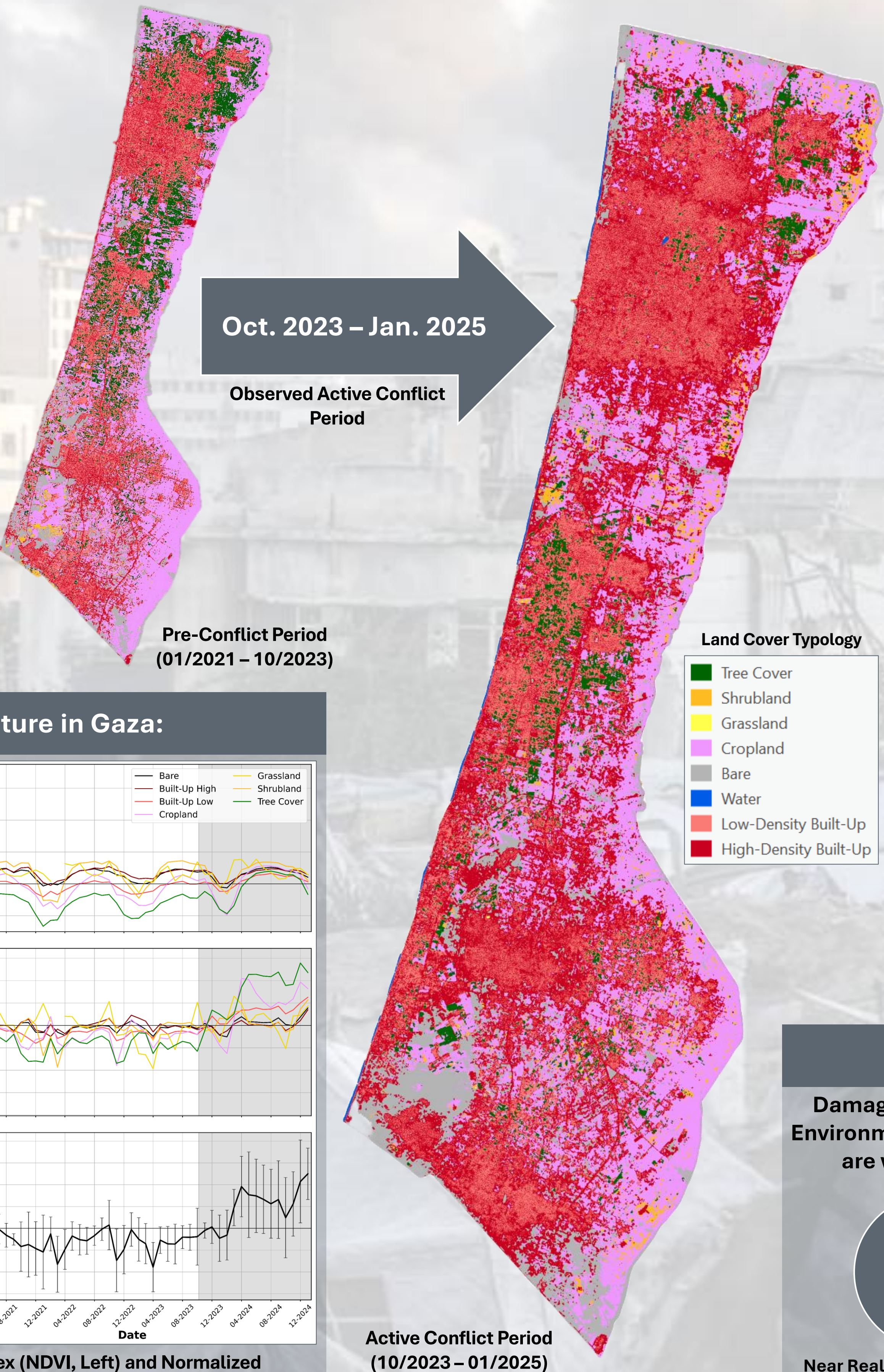
**Normalized Difference Building Index (NDBI)**  
Infrastructure

**ESA WorldCover 2020 Land Cover**  
Land Use Change

**Conflict Periods:**

**Pre-Conflict Period:** 15 January 2021 – 6 October 2023

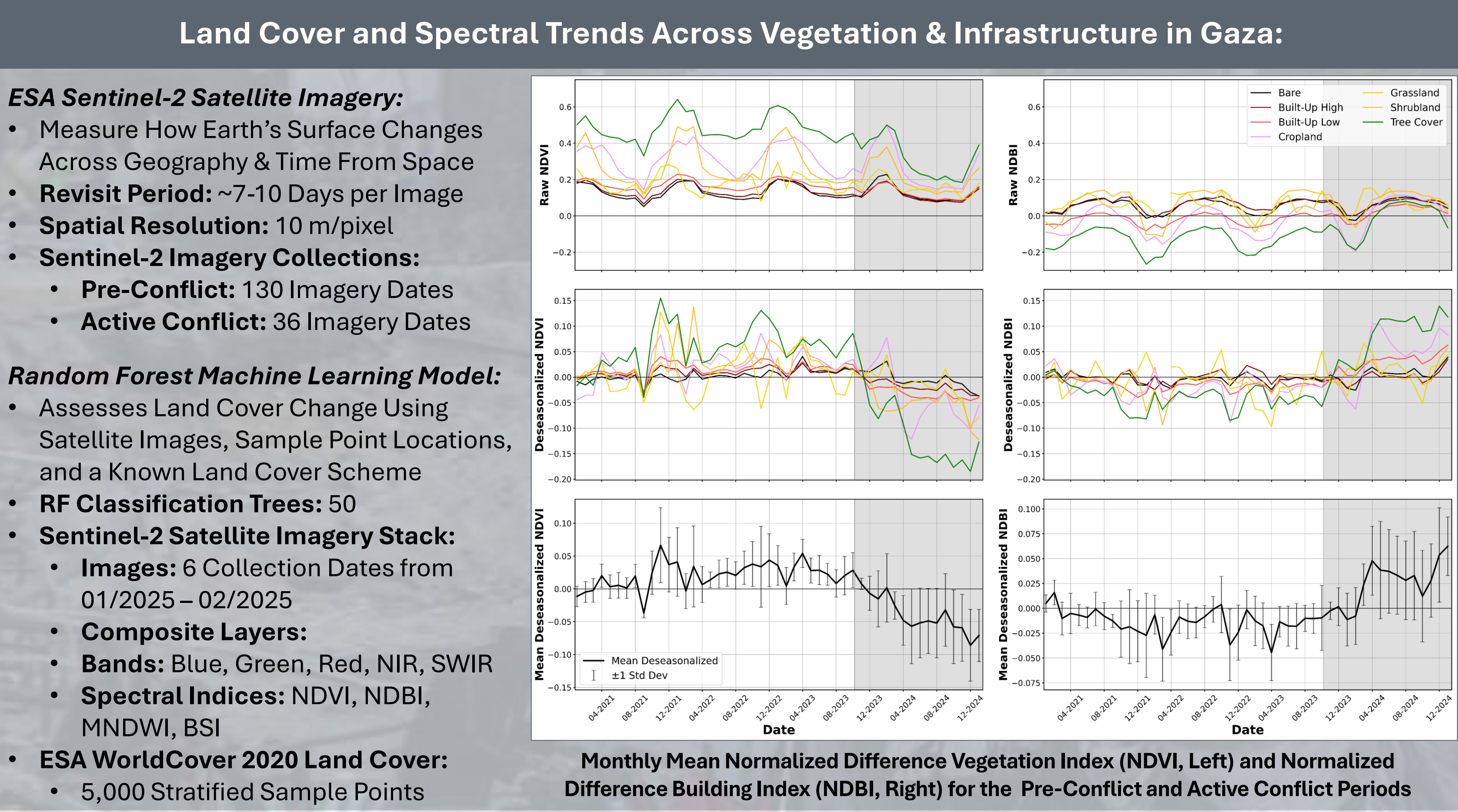
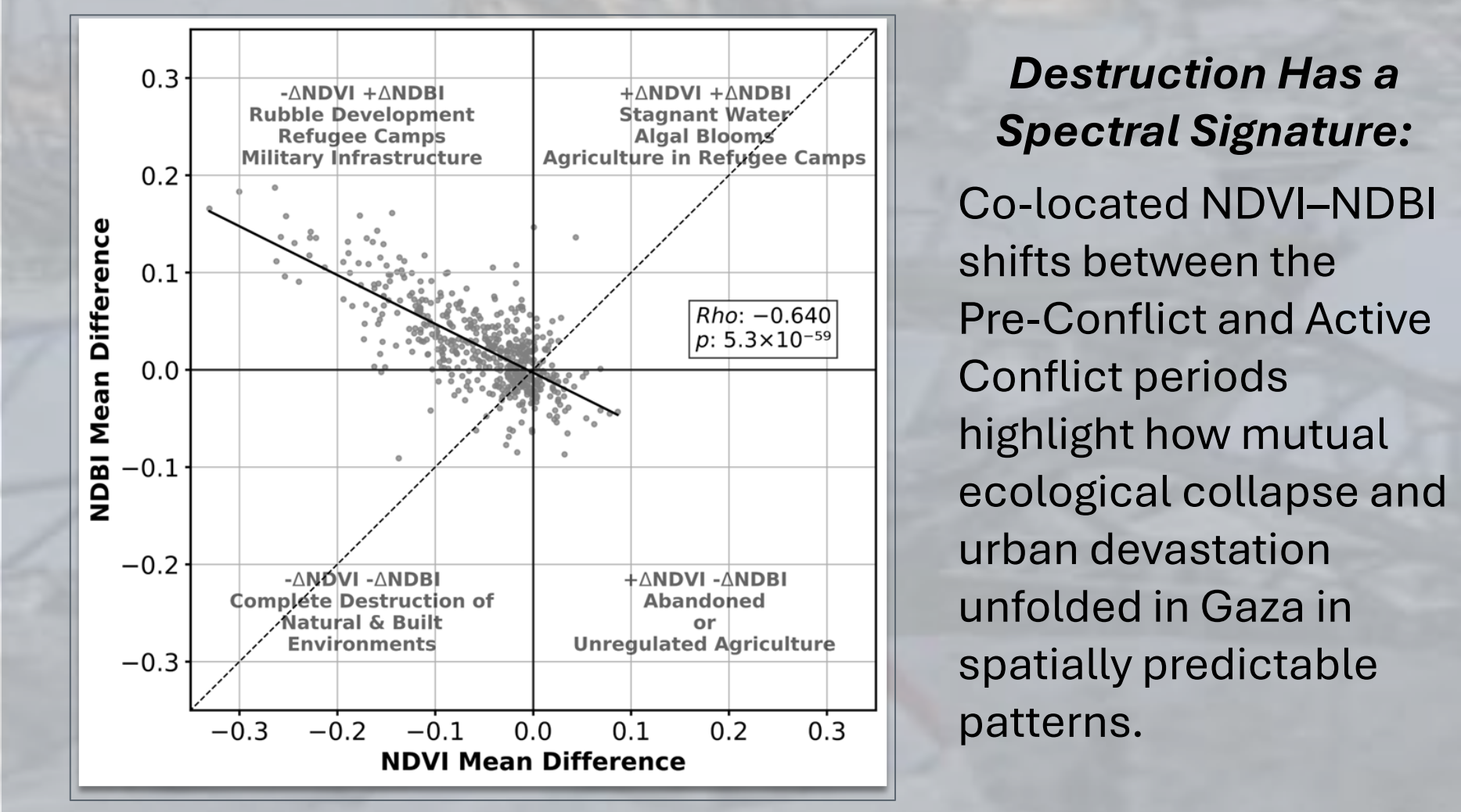
**Active Conflict Period:** 7 October 2023 – 15 January 2025 (Temporary Ceasefire)



**64% Decline in Agricultural Areas**

**121% Increase in Built-Up Areas (Rubble)**

**41.0 km<sup>2</sup> of Agricultural Lands to Rubble**



### What Comes Next for Gaza?

**Damage to the environment, in Gaza, is not a side effect of armed conflict. Environmental warfare exists as a central component of how modern conflicts are waged through demoralization, destruction, and coercion tactics**

**Near Real-Time Monitoring & Dataset Validation**

**Actor Accountability & Peacebuilding Capacity**

**Informed Solutions & Actionable Policy Outcomes**