



GEOGUARD

Iraq Water Security Dashboard

Original Objective

Monitor trends in water scarcity and conflict throughout Iraq to enable data-driven, multilateral decision-making



Our Approach



High resolution Imagery

- Expensive
- Specific AOI
- Private data ownership
- Snapshots in time



Open-source data

- Free
- Global coverage
- Openly available
- Multidecadal observational horizon

Building the Geodatabase

Includes over a million datapoints on carefully selected indicators



Soil Moisture

Source: SMAP

Temporal Availability: 2015-present



Groundwater Change

Source: GRACE

Temporal Availability: 2002-present



Precipitation

Source: CMORPH

Temporal Availability: 1998-present



Surface Water Change

Source: GRACE

Temporal Availability: 2002-present



Population

Source: WorldPop

Temporal Availability: 2000-2020



Vegetation

Source: NDVI

Temporal Availability: 1981-present



Total Water Change

Source: GRACE

Temporal Availability: 2002-present



Conflict

Source: UCDP

Temporal Availability: 1975-present



Land Surface Temperature

Source: MODIS

Temporal Availability: 2000-2022



Surface Water Extent

Source: GLAD

Temporal Availability: 1999-present



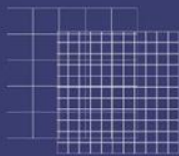
10 Indicators
19 Governorates
25 Satellites
120 Districts
>500k Datapoints

3-Step Process



ACQUISITION

Half a million datapoints from 25 Satellites



NORMALIZATION

Variance from historical average calculated for each month



AGGREGATION

Values averaged for each district and governorate level polygon



2/2024

Default Mode



INDICATORS

Total Water Change

4/2002 - 3/2023

Supply



Land Water Change

8/2002 - 5/2023

Supply



Groundwater Storage

4/2002 - 3/2023

Supply



Precipitation

1/1998 - 9/2022

Supply



Surface Water Extent

1/2000 - 12/2020

Supply



Vegetation

1/1998 - 6/2023

Demand



Conflict

1/1989 - 12/2019

Conflict



Land Surface Temperature

2/2000 - 5/2023

Other



Population

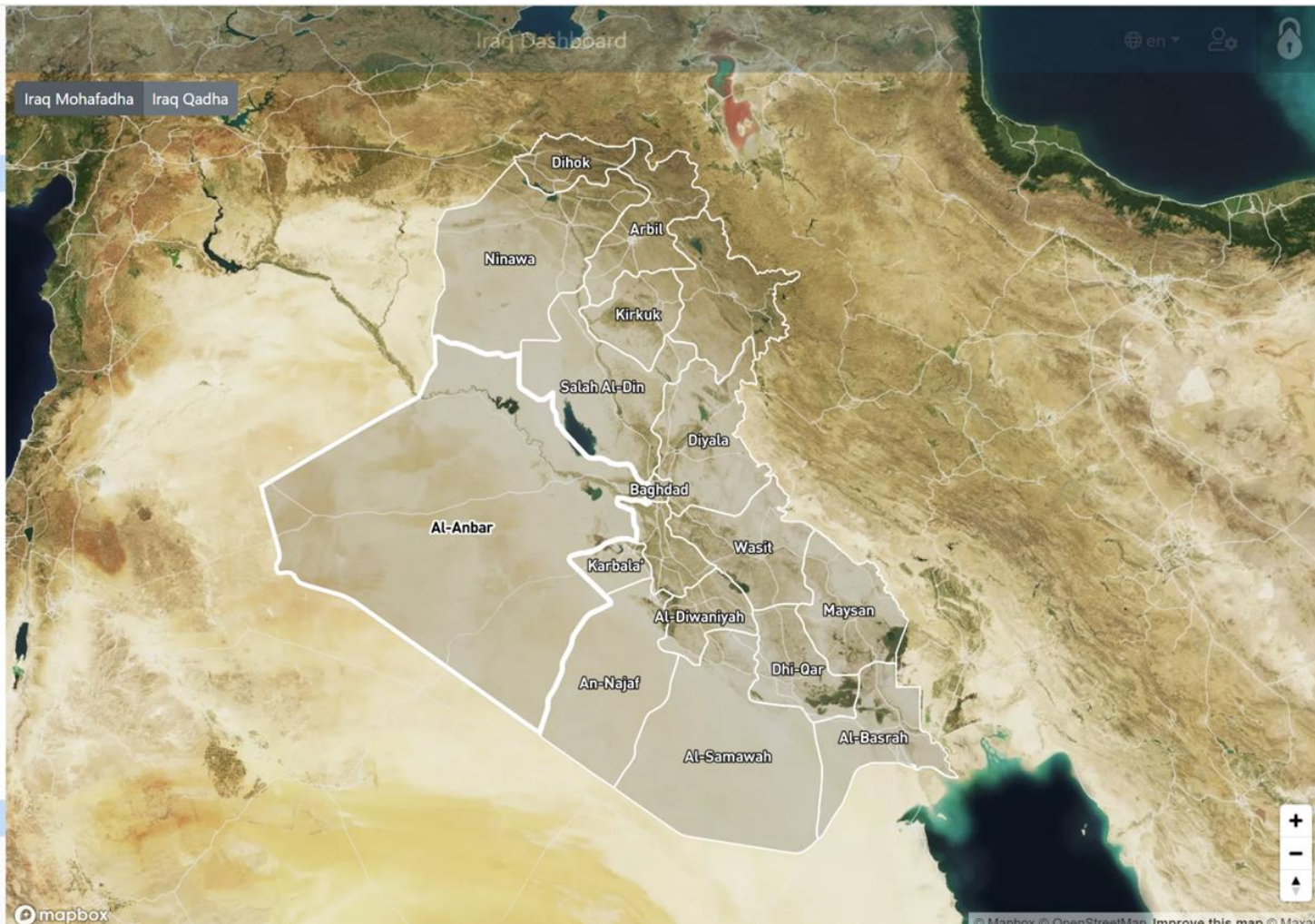
1/2000 - 12/2022

Demand



OVERLAYS

 Documentation and Help





2/2024

Default Mode

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Conflict

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Conflict ?

Land Surface Temperature

2/2000 - 5/2023

Other ?

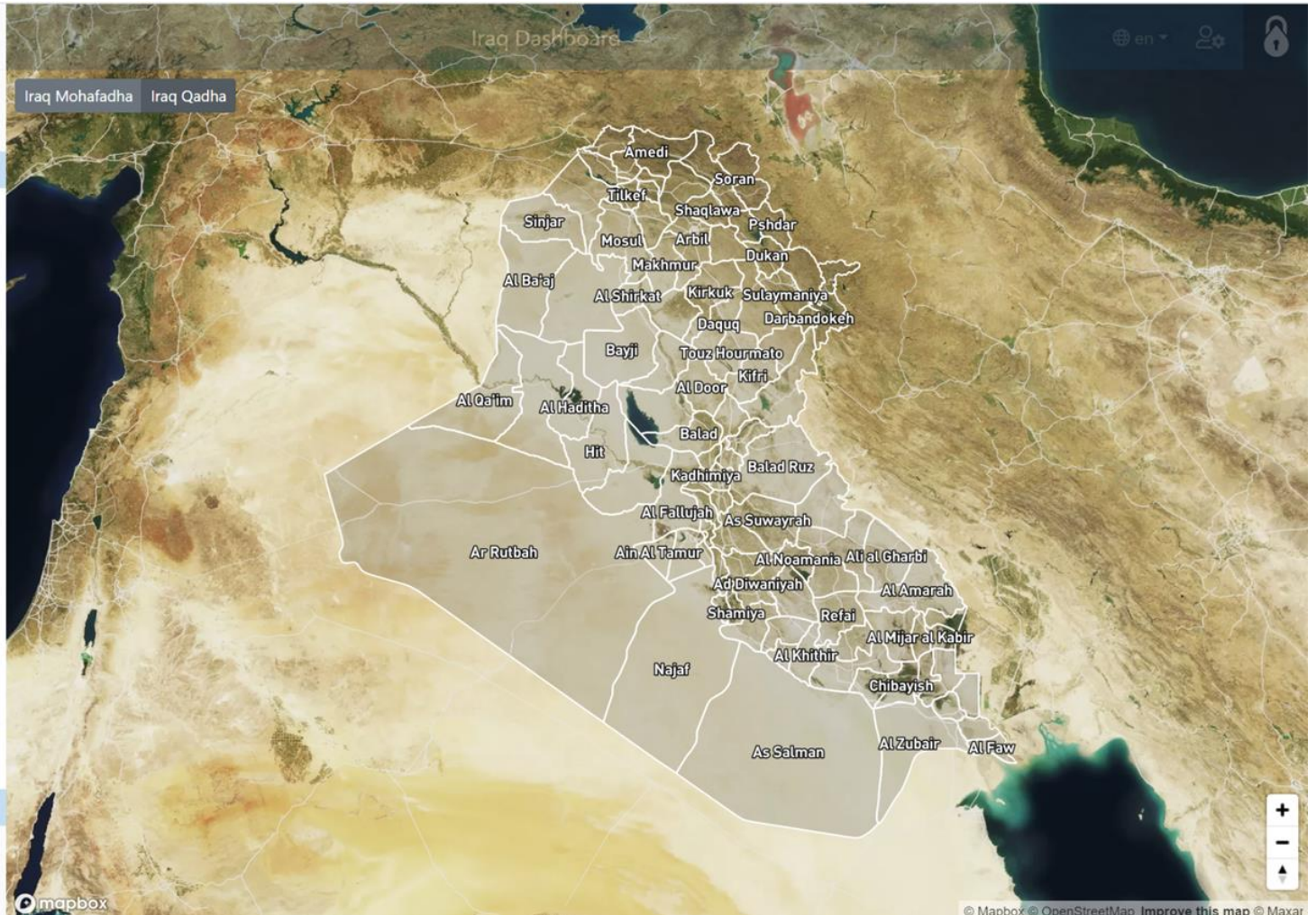
Population

1/2000 - 12/2022

Demand ?

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4/2022

Default Mode



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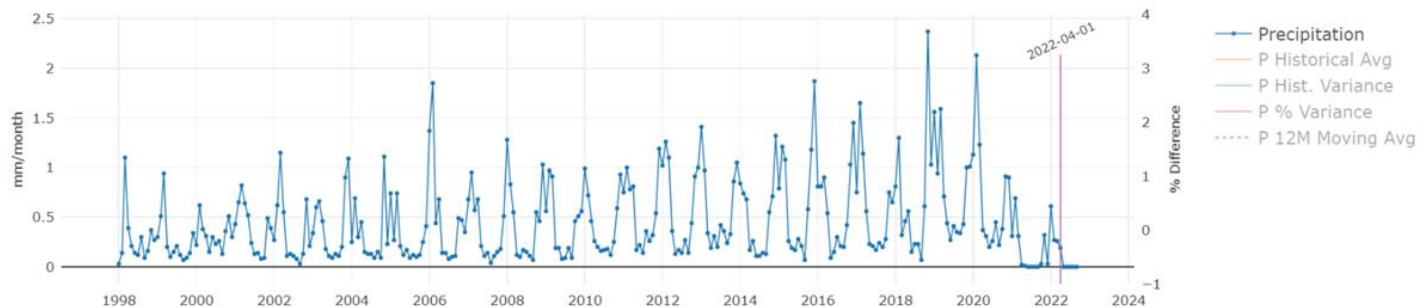
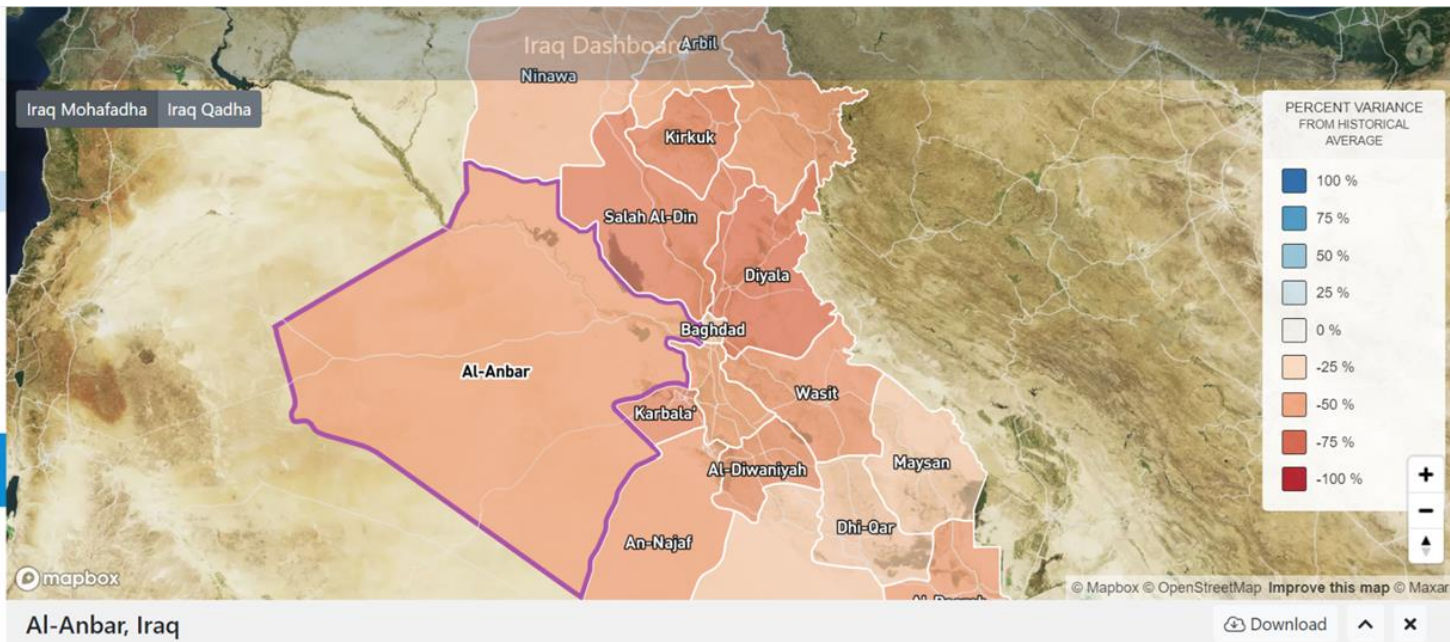
Population

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4/2022

Default Mode



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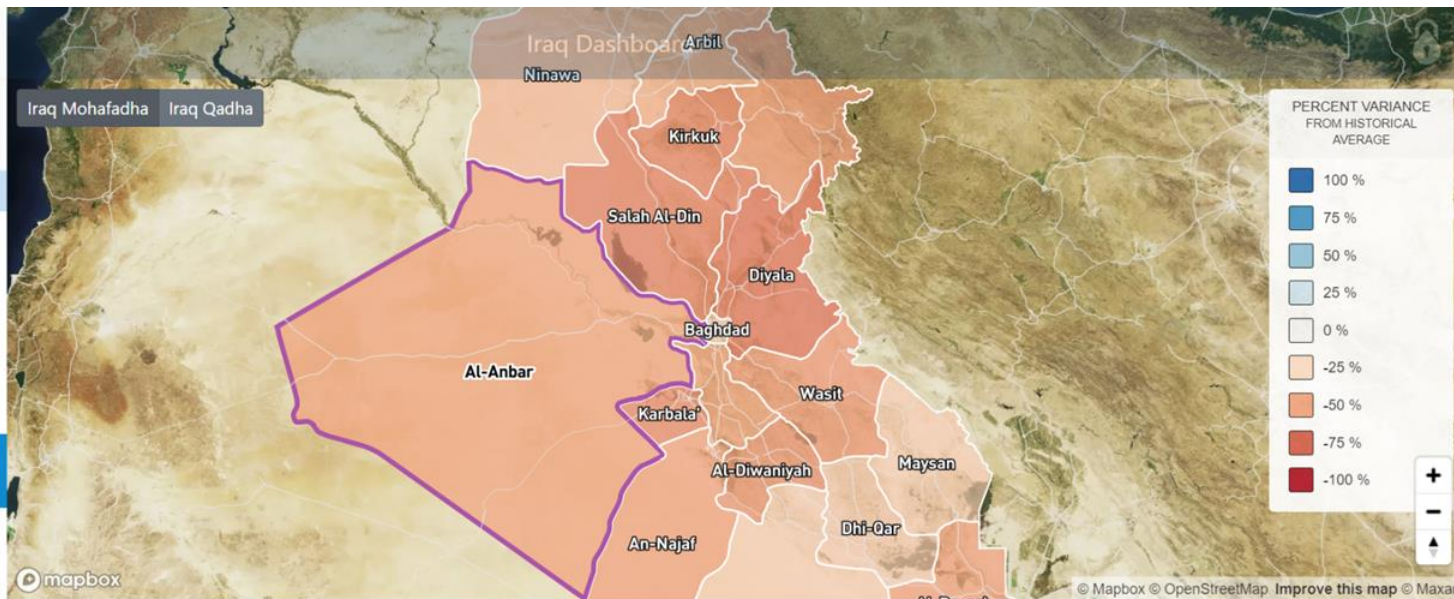
Population

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Demand ?

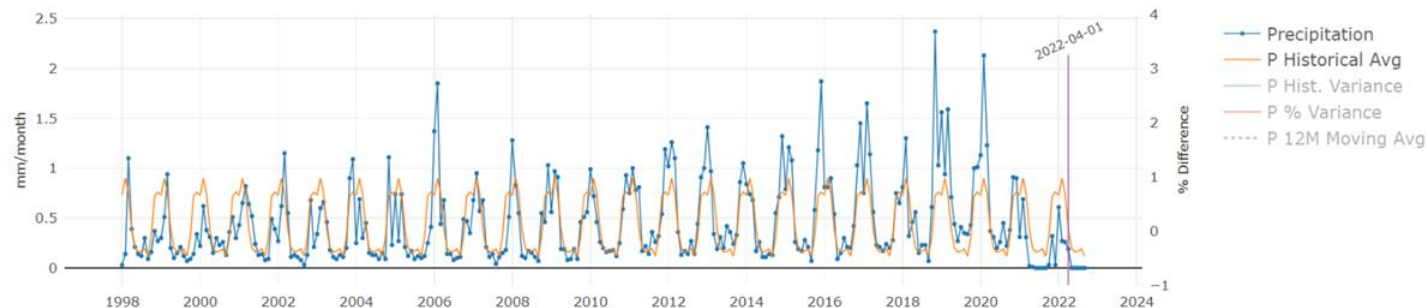
OVERLAYS

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Al-Anbar, Iraq

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4/2022

Multi Indicators ▾

INDICATORS

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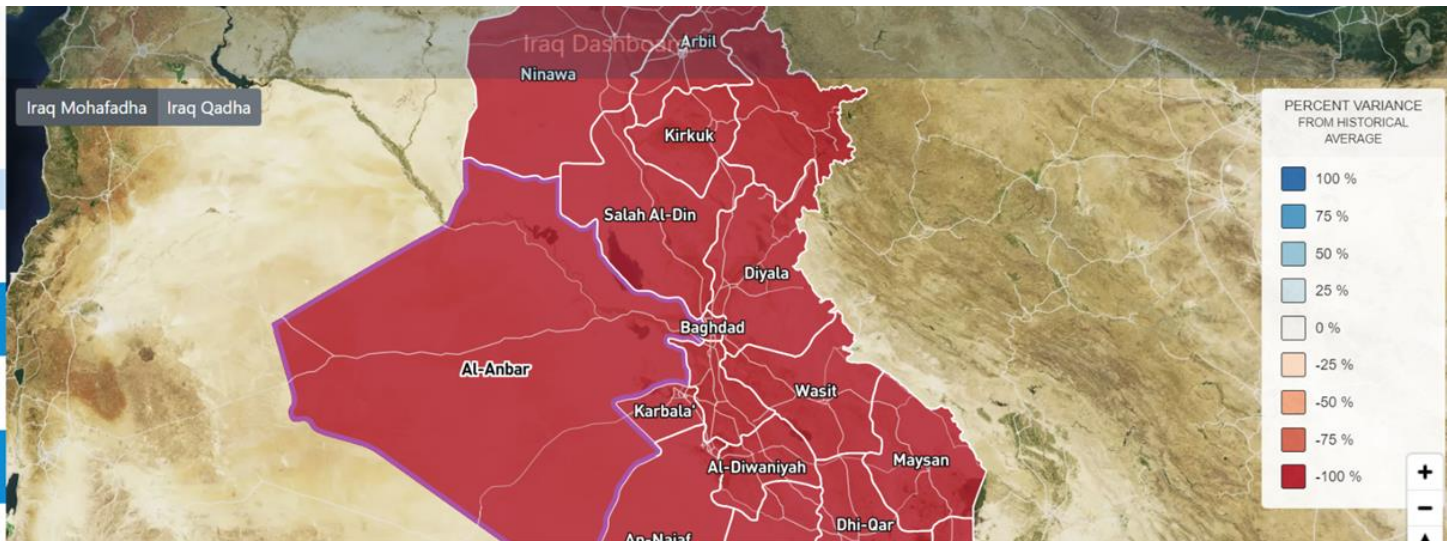
Population

1/2000 - 12/2022

Demand ?

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Land Water Change ✕

Precipitation ✕

Composite/Compare

Al-Anbar, Iraq

Download





4/2022

Multi Regions



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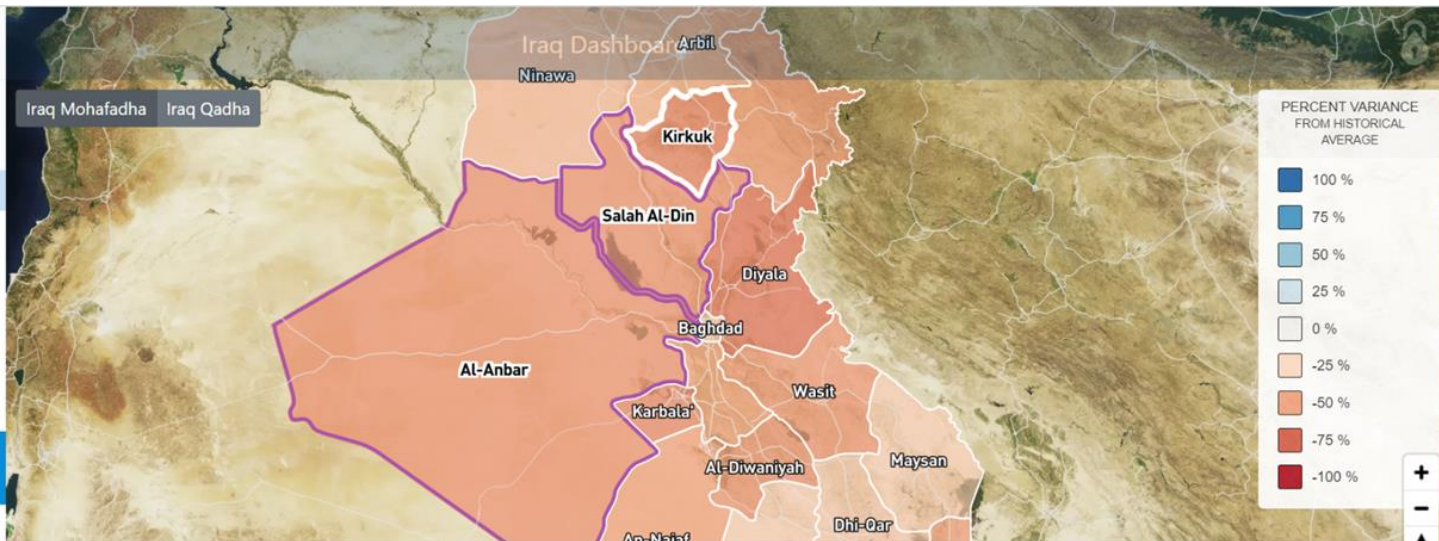
1/2000 - 12/2022

Demand



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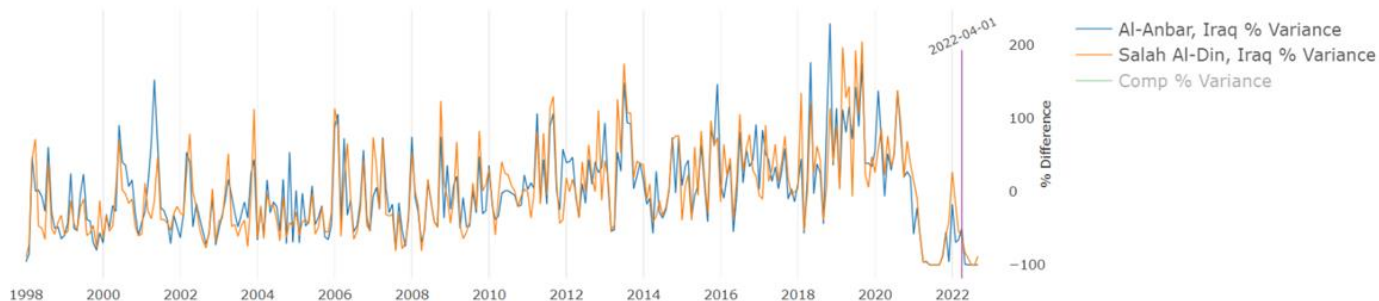
Al-Anbar, Iraq

Salah Al-Din, Iraq

Composite/Compare

Precipitation

Download





6/2023

Default Mode



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Soil Moisture

12/2015 - 8/2022

Supply ?

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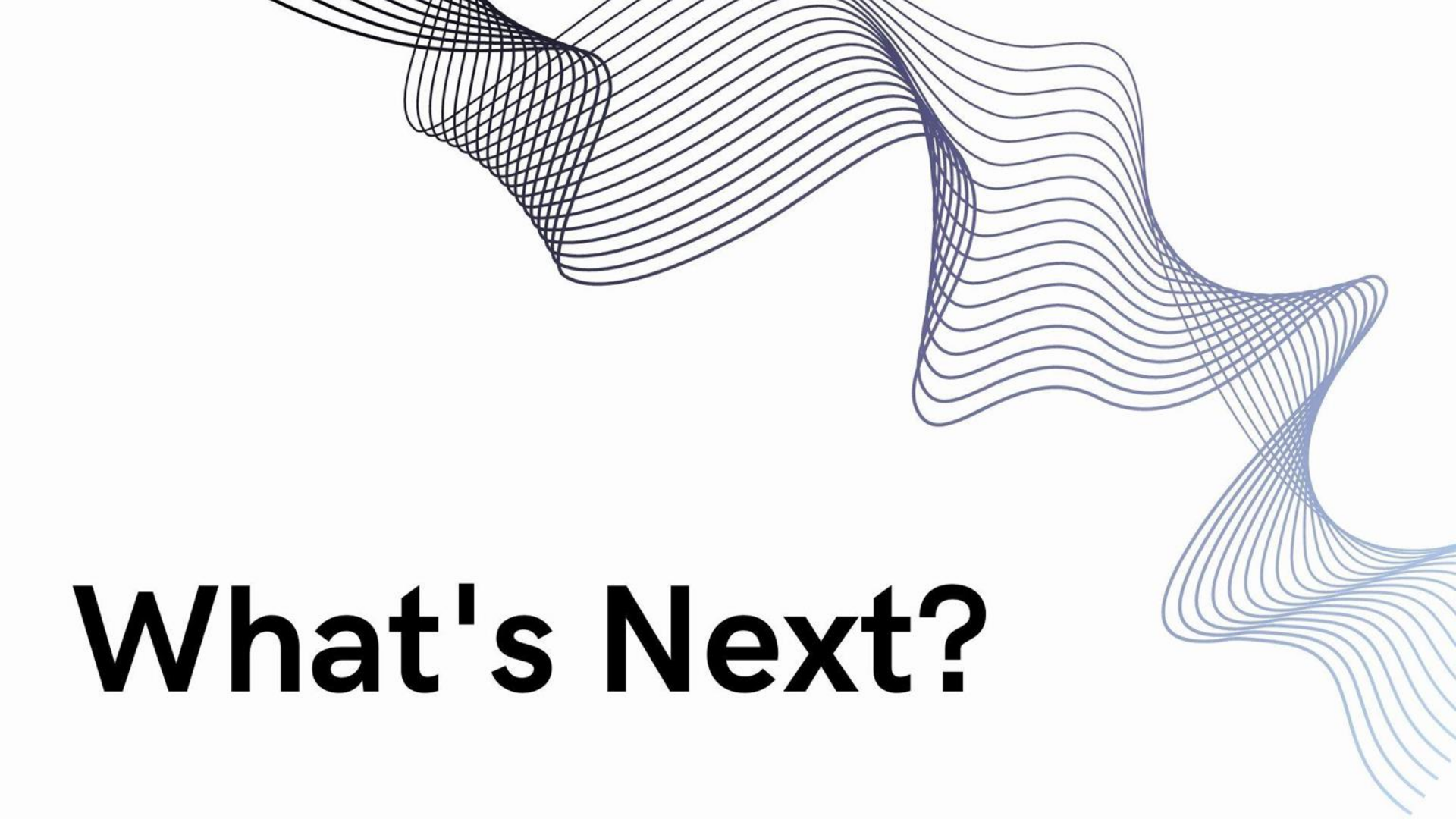
OVERLAYS

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UNOCA Regions

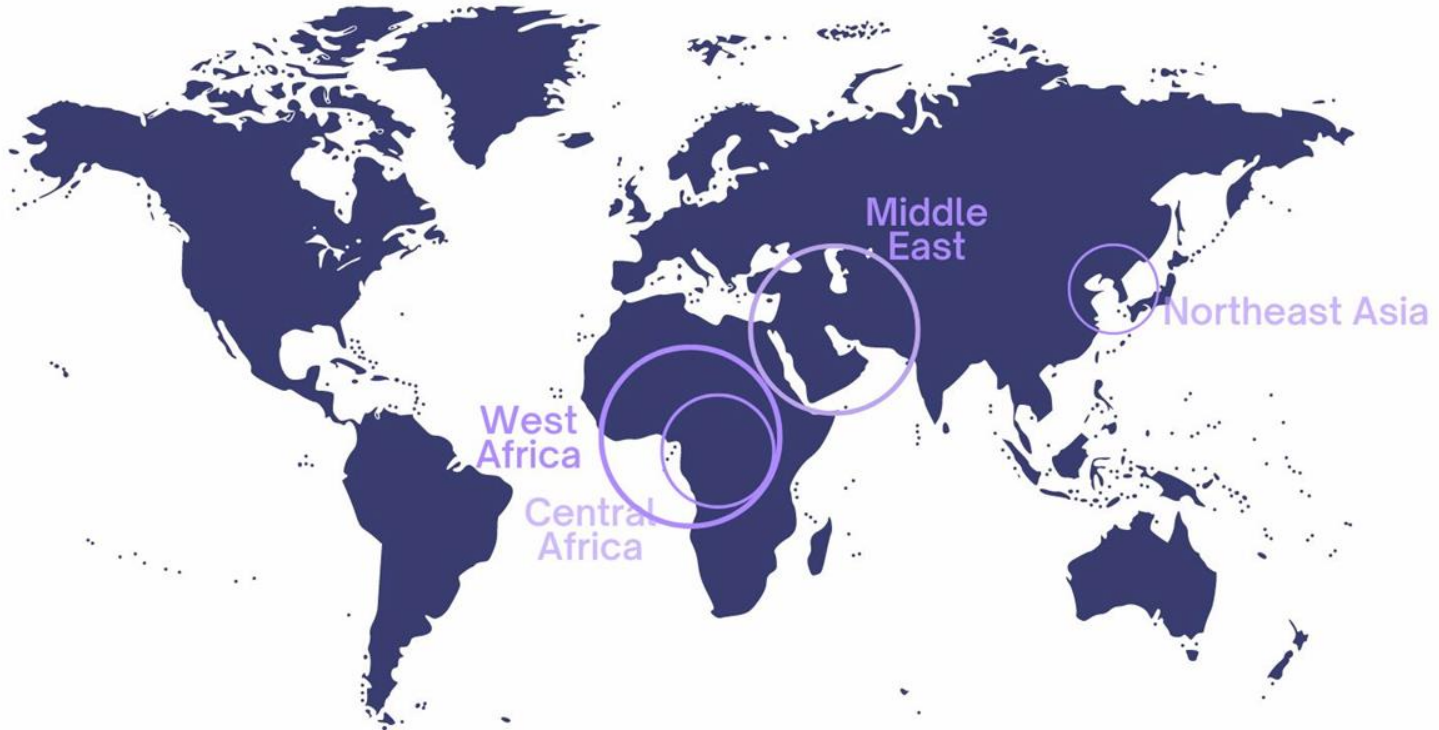
UNOCA Subregions



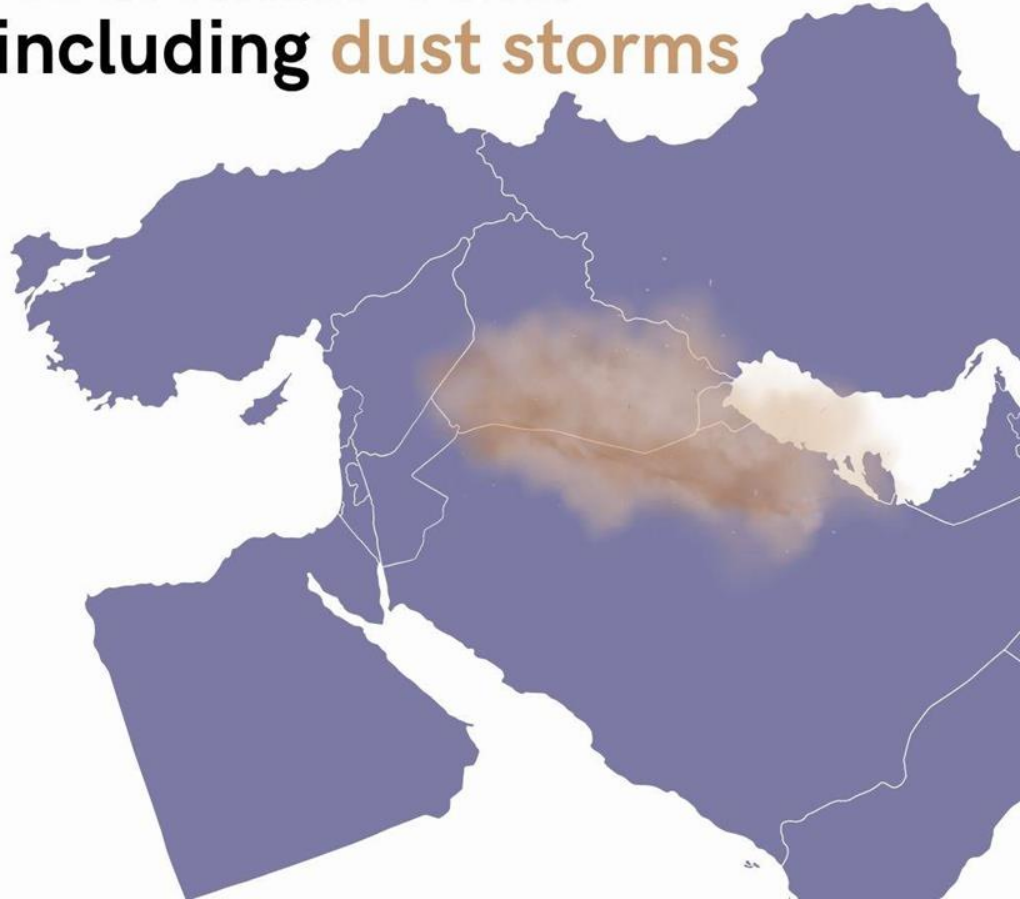
The background features a series of blue, wavy, horizontal lines that create a sense of motion and depth. These lines are layered, with some appearing more prominent than others. In the upper left and middle right sections, there are areas where these lines intersect to form a fine grid or mesh pattern, adding a geometric element to the organic-looking waves.

What's Next?

**In 2023, the Innovation Cell will expand
Geogaurd across the Middle East & West Africa**



And advance its ability to monitor other transboundary issues, including **dust storms**



With each expansion, new geospatial methods + data architectures are developed. They are transferable to other projects

