# Investing in Green Technologies

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# Why Investing Technology?

Challenges

## Climate – Water – Food – Environment Nexus

**Advance the science**

**Drive Decisions**

**Shape Policy**

Systems

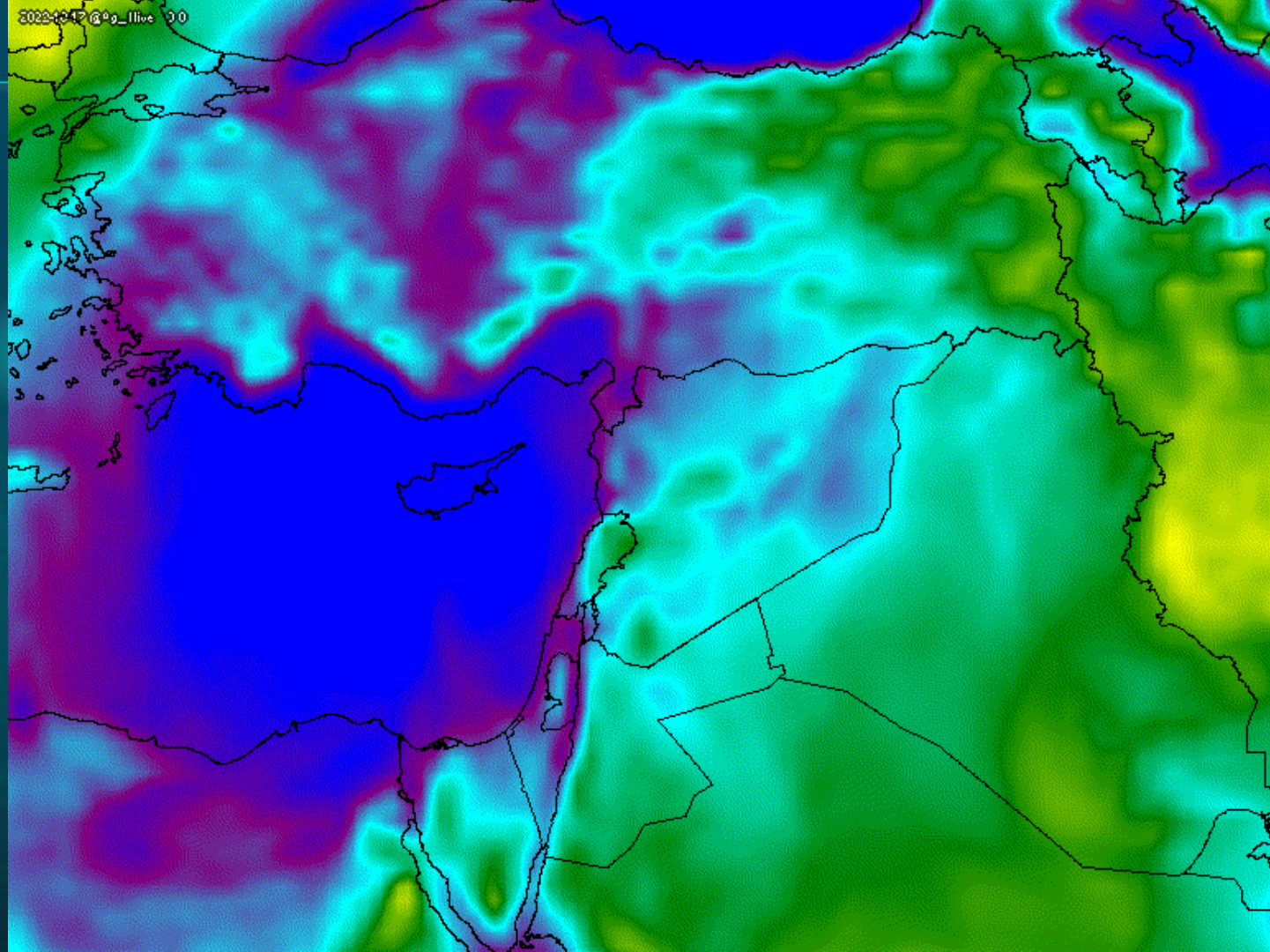
**Remote Sensing**

**Smart systems**

**Big Data**

**Software**

Agriculture
Water
Food
Environment



# AREAS

Agriculture

Conflicts, Food & Water Security

GIS and Remote Sensing

Climate Change Impact

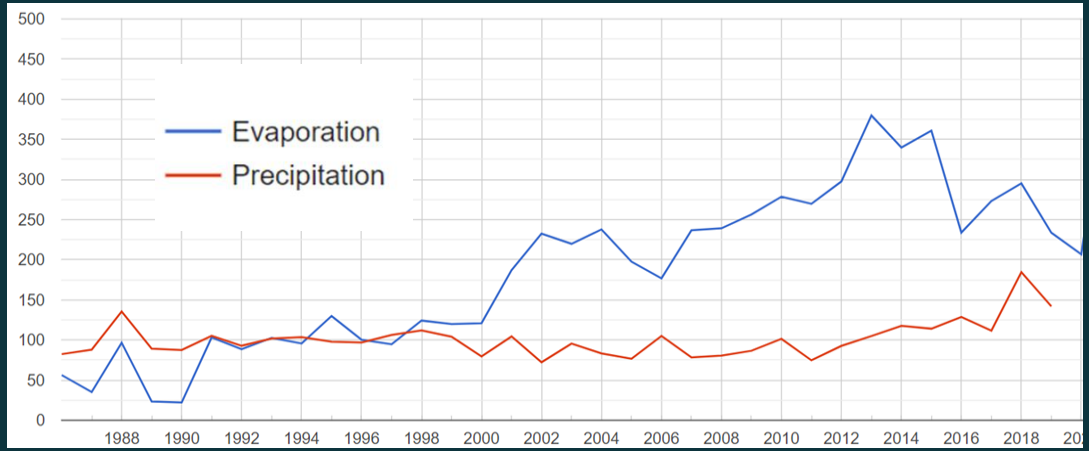
Hydrology & Floodplain Analysis

Irrigation System Design Rehabilitation & Development

Know water use

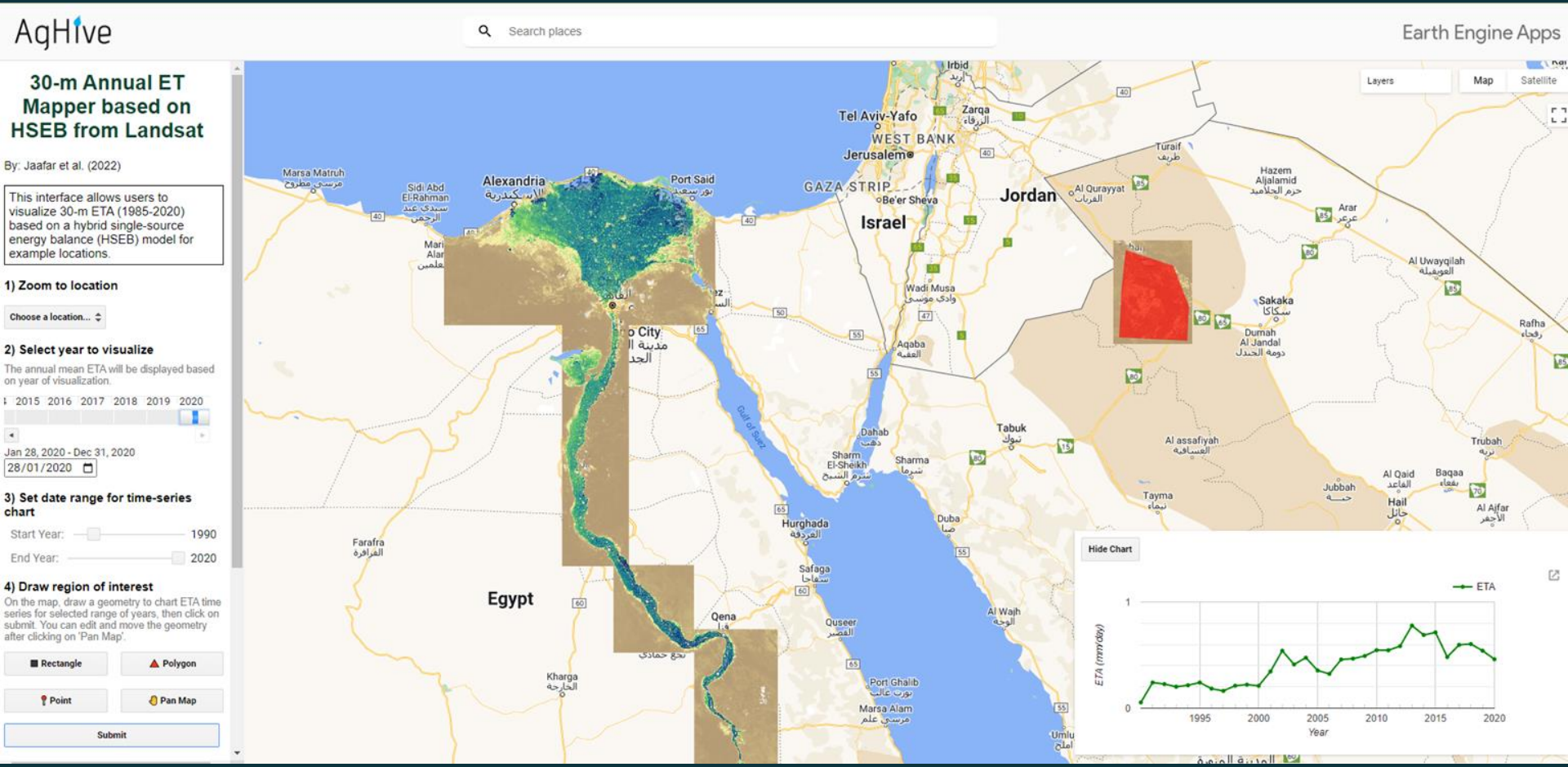
# 1. HSEB: Technology for drought and water management

1986


500
450
400
350
300
250
200
150
100
50
0
Evaporation
Precipitation
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018

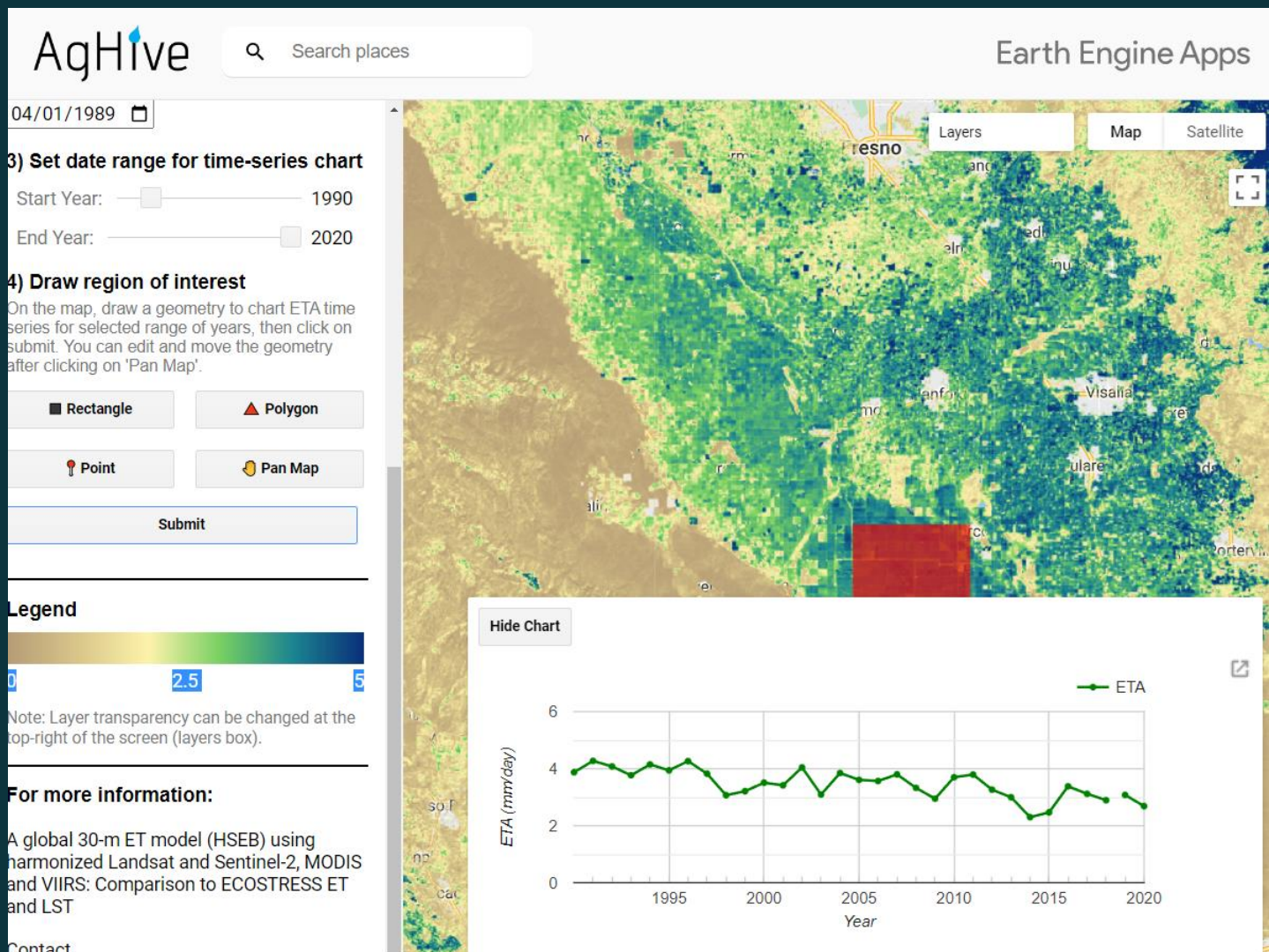

0
5

# How do they do it?



# ET, Ca

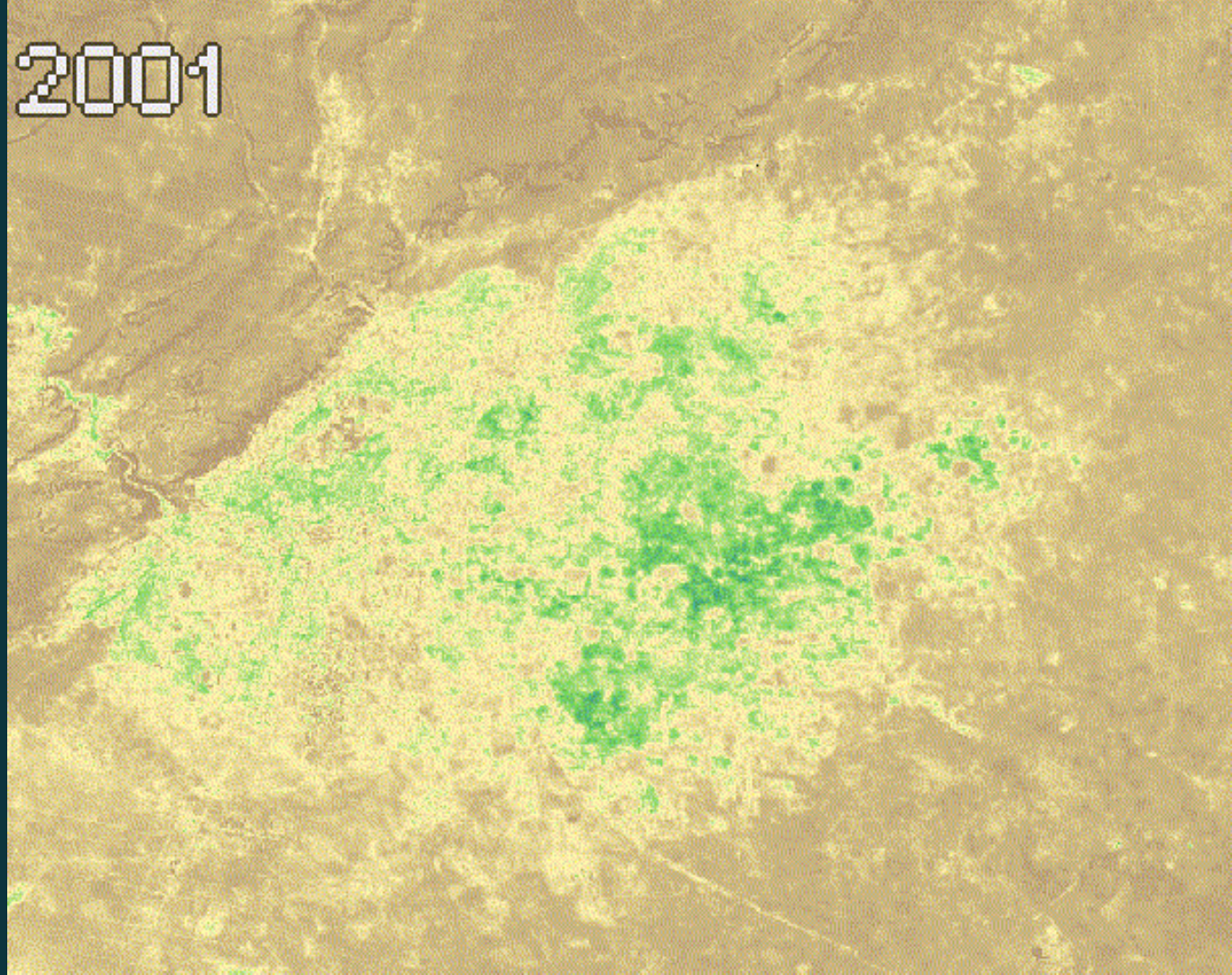
Decreasing over crop lands



# Damascus ET

Effect of the conflict on

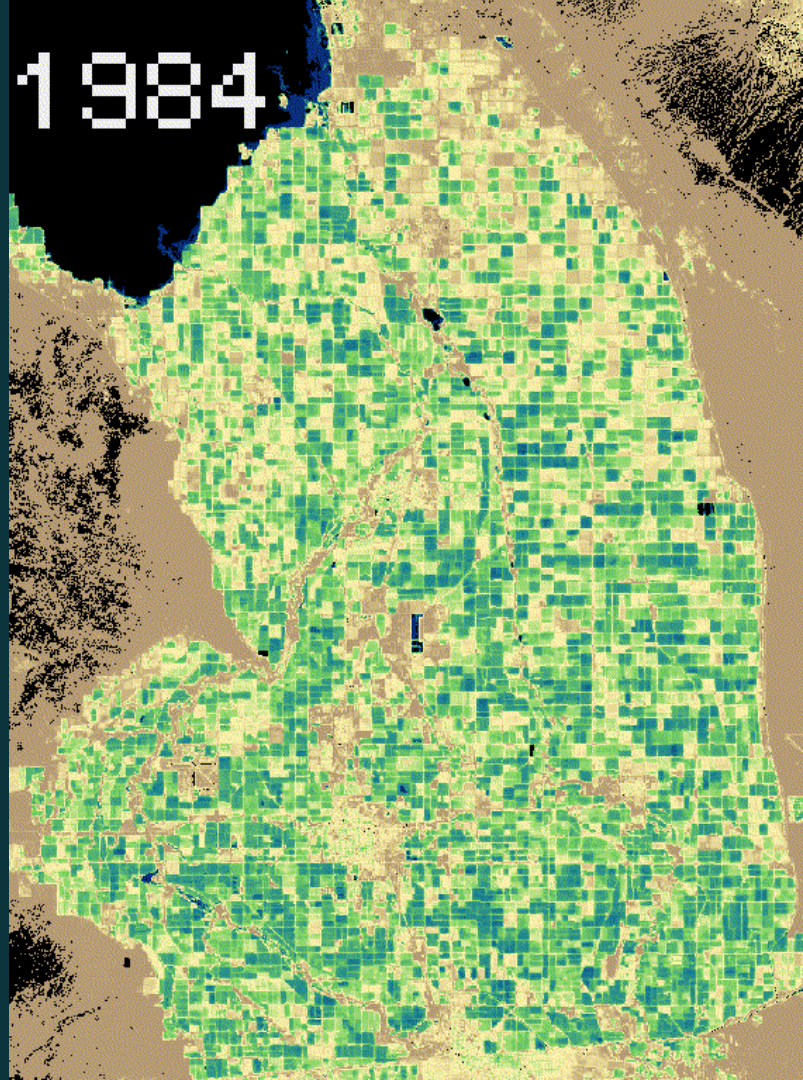
Agriculture



# Imperial Valley, CA

Annual 30m- HSEB ET from Landsat

(1984-2021)



Google Earth Engine

Search places and datasets...

# Actual ET Mapper at 100 m resolution using HSEB

By: Jaafar et al. (2022)

This interface allows users to visualize global ETA (1990-2021) based on a hybrid single-source energy balance (HSEB) model.

**Select year to visualize:**

2016 2017 2018 2019 2020 2021

Jan 21, 2017 - Jan 22, 2018

21/01/2017

**Select date range:**

Start Year: 1990

End Year: 2021

lon: -115.44 lat: 32.98

**Legend**

0 2.5 5

Note: Layer transparency can be changed at the top-right of the screen (layers box).

**For more information:**

A global 30-m ET model (HSEB) using harmonized Landsat and Sentinel-2, MODIS and VIIRS: Comparison to

Click anywhere on map to plot monthly ETA time series.
Annual ETA will be displayed based on year of visualization.

Layers

Map Satellite

Brawley

Holtville

El Centro

78

Hide Chart

ETA

ETA (mm/month)

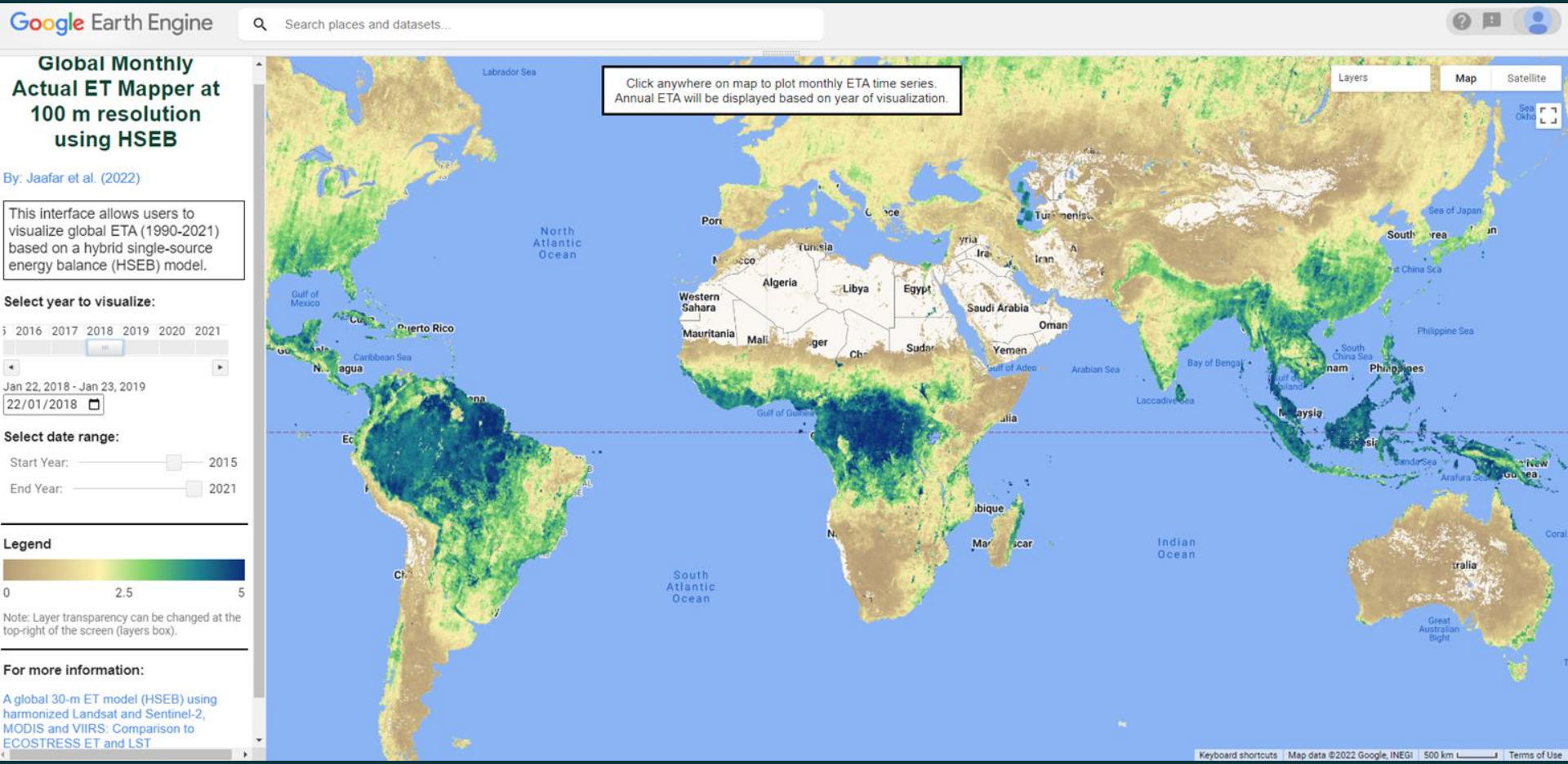
10

5

0

01-1995 01-2000 01-2005 01-2010 01-2015 01-2020

Date


Google Earth Engine
Search places and datasets...
Global Monthly Actual ET Mapper at 100 m resolution using HSEB
By: Jaafar et al. (2022)
This interface allows users to visualize global ETA (1990-2021) based on a hybrid single-source energy balance (HSEB) model.
Select year to visualize:
2016 2017 2018 2019 2020 2021
Jan 22, 2018 - Jan 23, 2019
22/01/2018
Select date range:
Start Year: 2015
End Year: 2021
Legend
0 2.5 5
Note: Layer transparency can be changed at the top-right of the screen (layers box).
For more information:
A global 30-m ET model (HSEB) using harmonized Landsat and Sentinel-2, MODIS and VIIRS: Comparison to ECOSTRESS ET and LST
Click anywhere on map to plot monthly ETA time series.
Annual ETA will be displayed based on year of visualization.
Layers
Map
Satellite
North Atlantic Ocean
South Atlantic Ocean
Indian Ocean
Tunisia
Algeria
Libya
Egypt
Western Sahara
Mauritania
Mali
Saudi Arabia
Oman
Yemen
Iran
Sea of Japan
Philippine Sea
Arabian Sea
Bay of Bengal
Gulf of Mexico
Caribbean Sea
Puerto Rico
Keyboard shortcuts
Map data ©2022 Google, INEGI
500 km
Terms of Use

Guide the Farmers

# 2. AgSAT: Affordable Technology for smart irrigation

Irrigation is the largest consumer of water

Water management is a key concern for the Arab Region

Most farmers don’t use ET data for irrigation

**Over-pumping**

**Irrigating at non-optimal times**

**Environmental Costs**

**Avoidable Energy Costs and Yield Losses**

# AgSAT

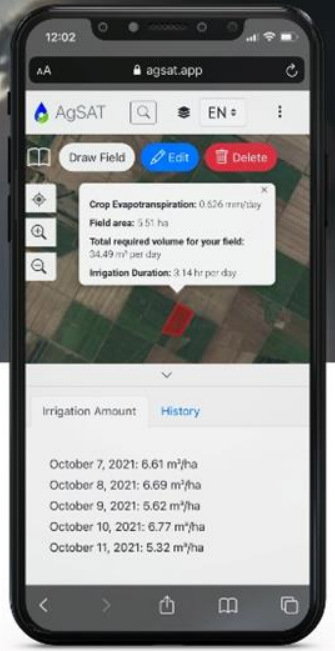
## FOR A SUSTAINABLE WORLD

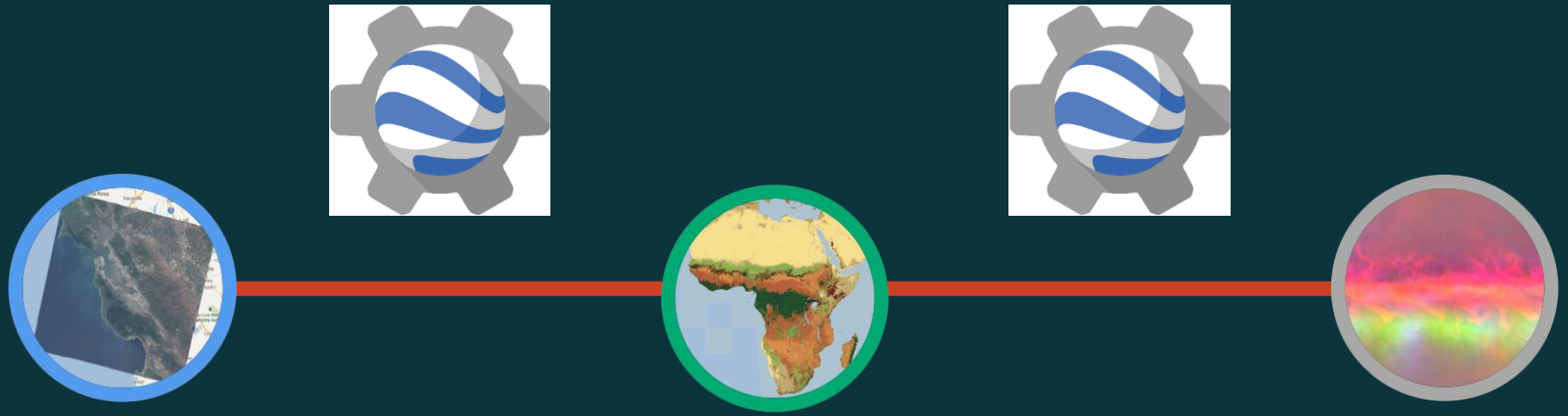
**IRRIGATE**
MORE **PRECISELY**

**Anywhere, Anytime**

Increase
**CROP YIELD**
Protect
**THE ENVIRONMENT**

powered by Google





Farmer's own data

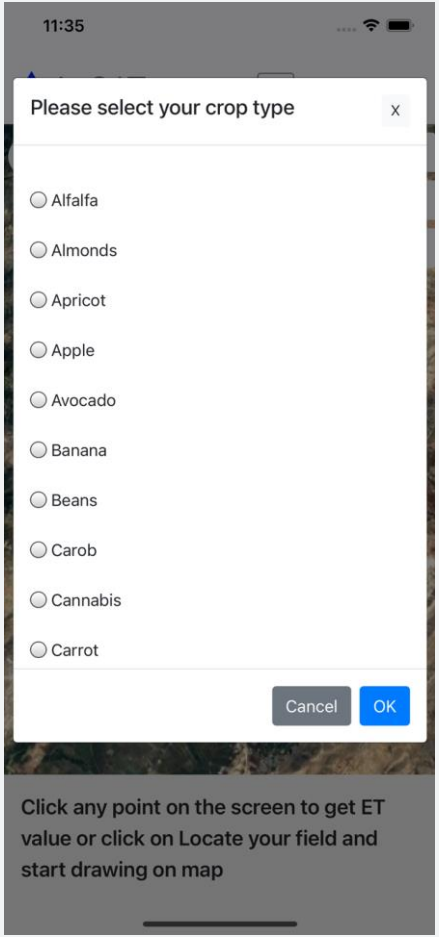
Reflectance-based
Growth Coefficients

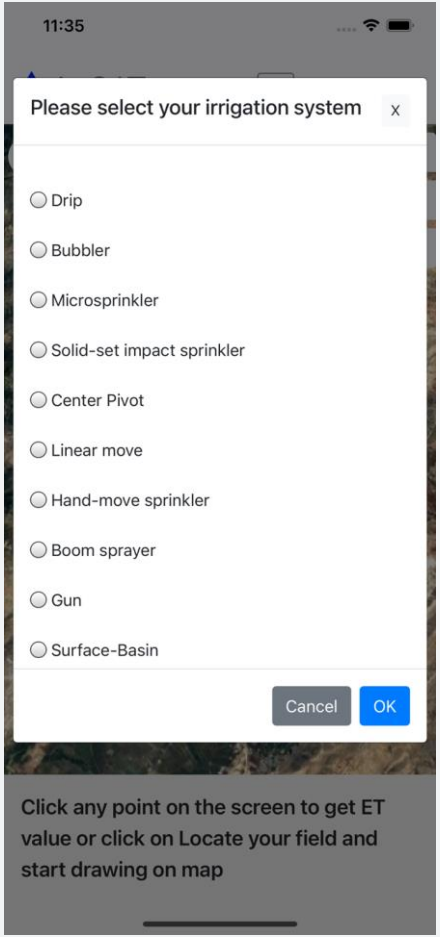
ETref

Volumes per ha, Irrigation Run times, 5-Days ETc

# AgSAT

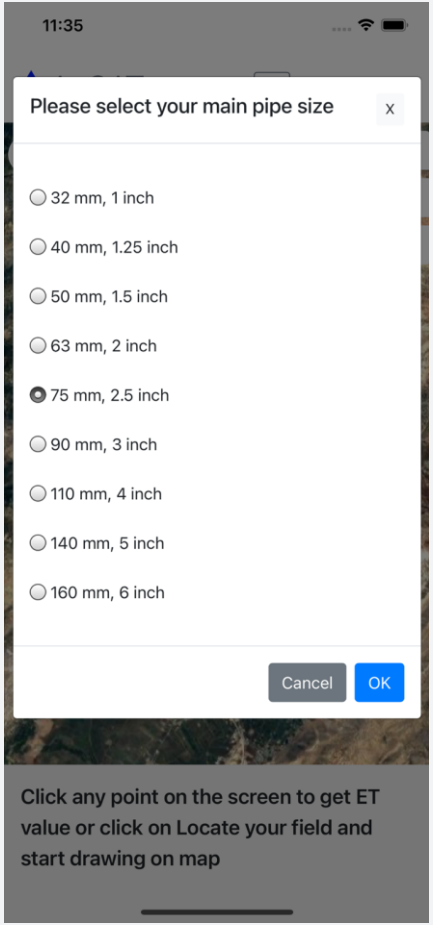

11:34
AgSAT
Draw Field
Click any point on the screen to get ET value or click on Locate your field and start drawing on map


11:35
Please select your crop type
x
Alfalfa
Almonds
Apricot
Apple
Avocado
Banana
Beans
Carob
Cannabis
Carrot
Cancel
OK
Click any point on the screen to get ET value or click on Locate your field and start drawing on map

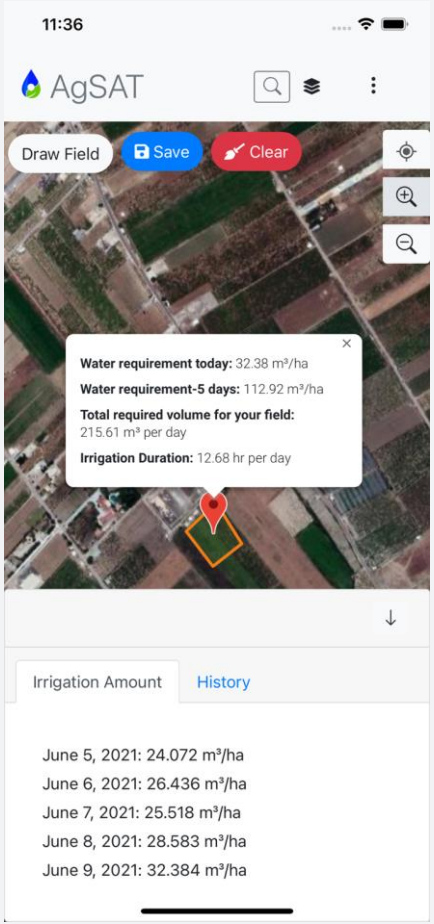

11:35
Please select your irrigation system
x
Drip
Bubbler
Microsprinkler
Solid-set impact sprinkler
Center Pivot
Linear move
Hand-move sprinkler
Boom sprayer
Gun
Surface-Basin
Cancel
OK
Click any point on the screen to get ET value or click on Locate your field and start drawing on map

# Navigation

# AgSAT

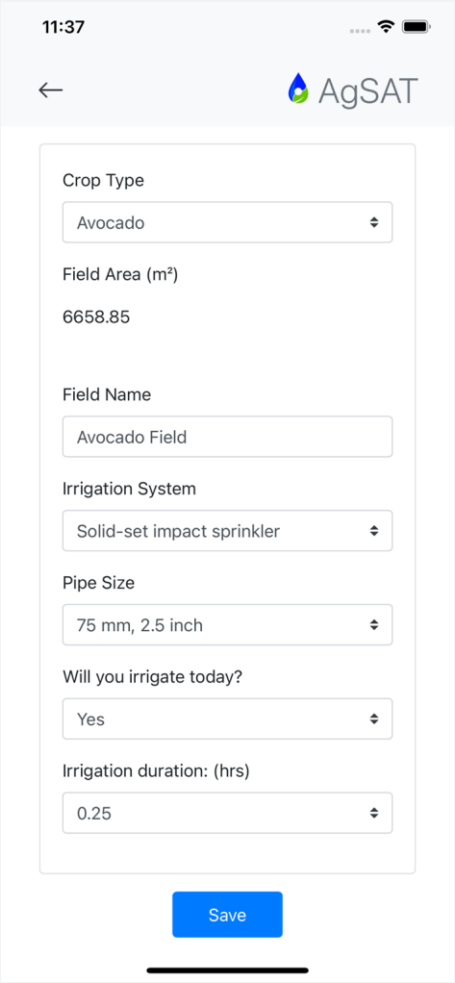


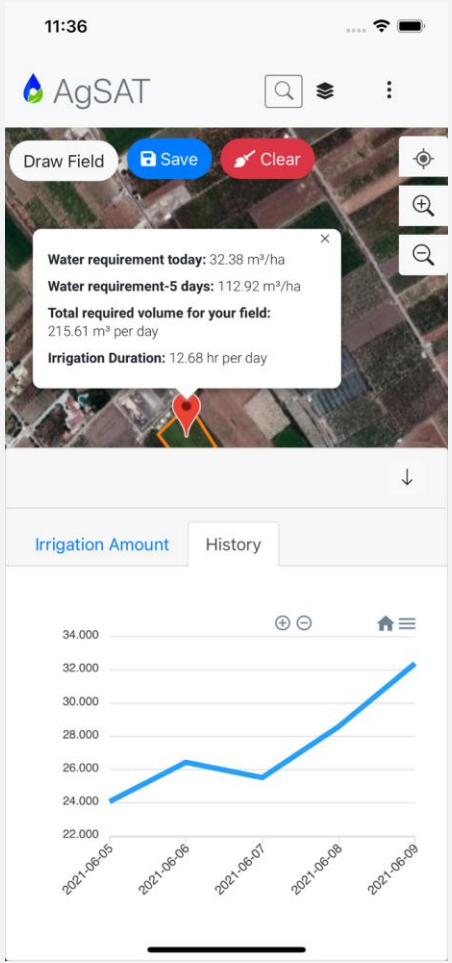




# Navigation

# AgSAT

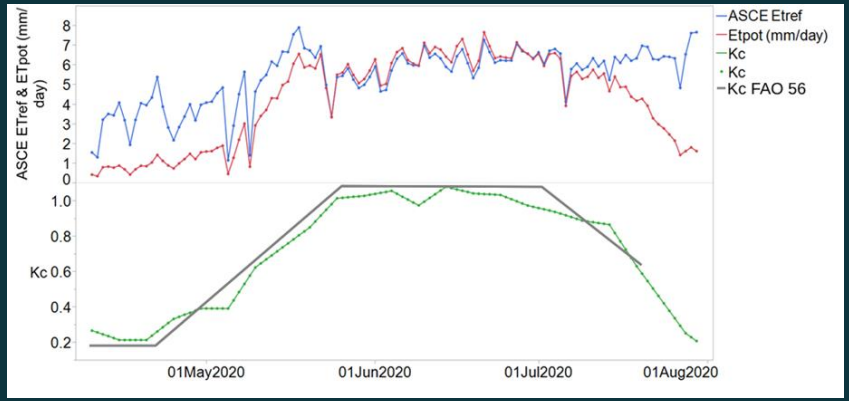


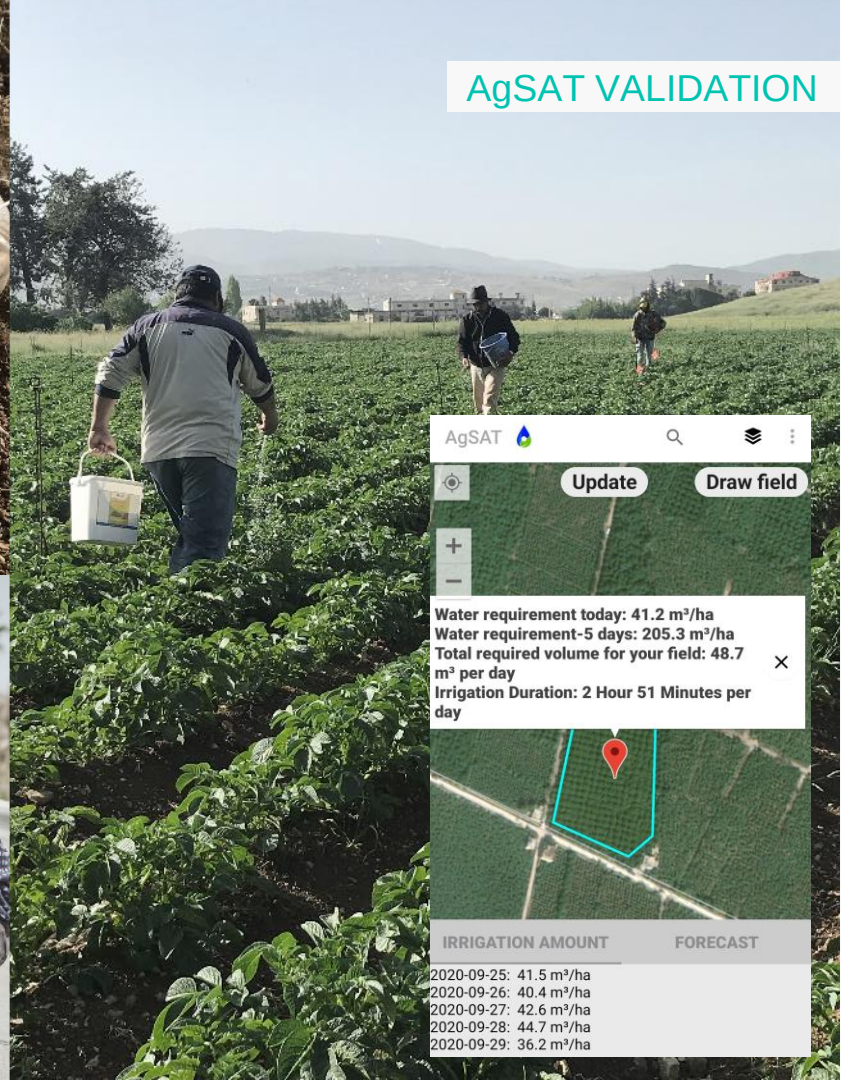




# AgSAT In Practice

## Validation the Bekaa Valley

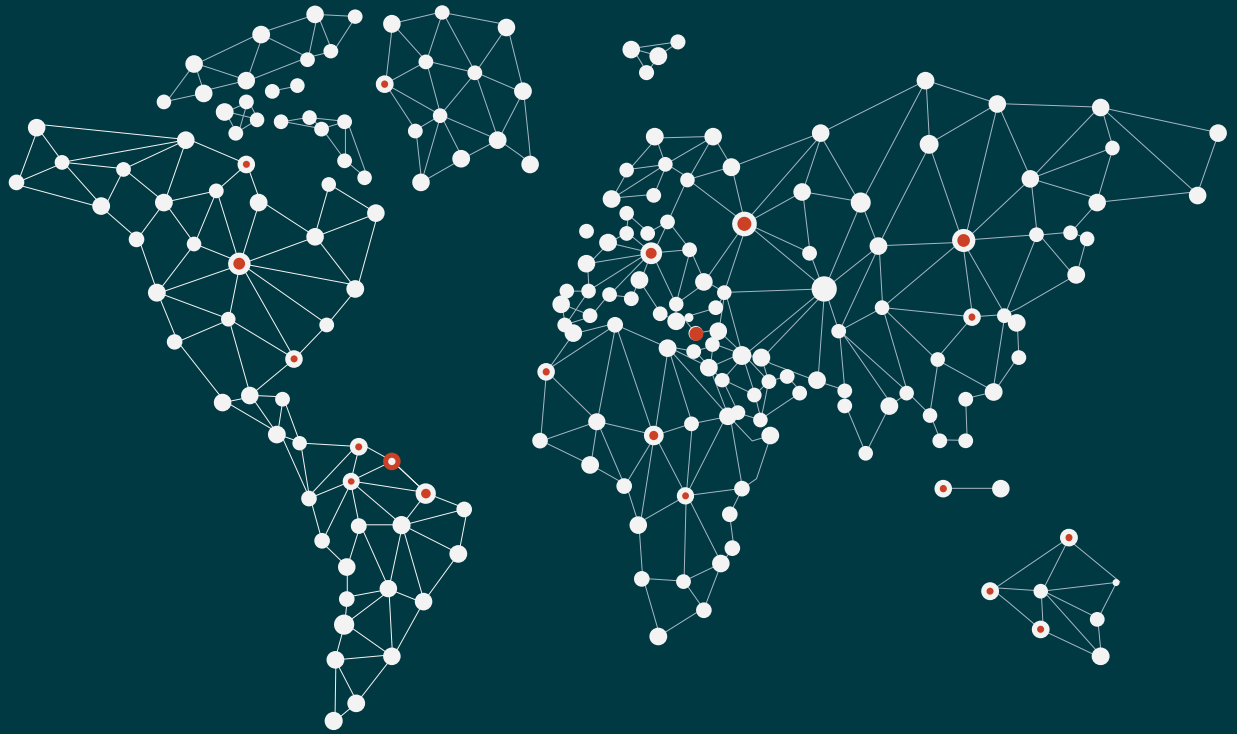
## Try it:
## Agsat.app



# AgSAT VALIDATION

# COUNTRIES WHERE AgSAT IS BEING USED



Protect and shield

# 3. Technologies for floods and water resources

# GCN

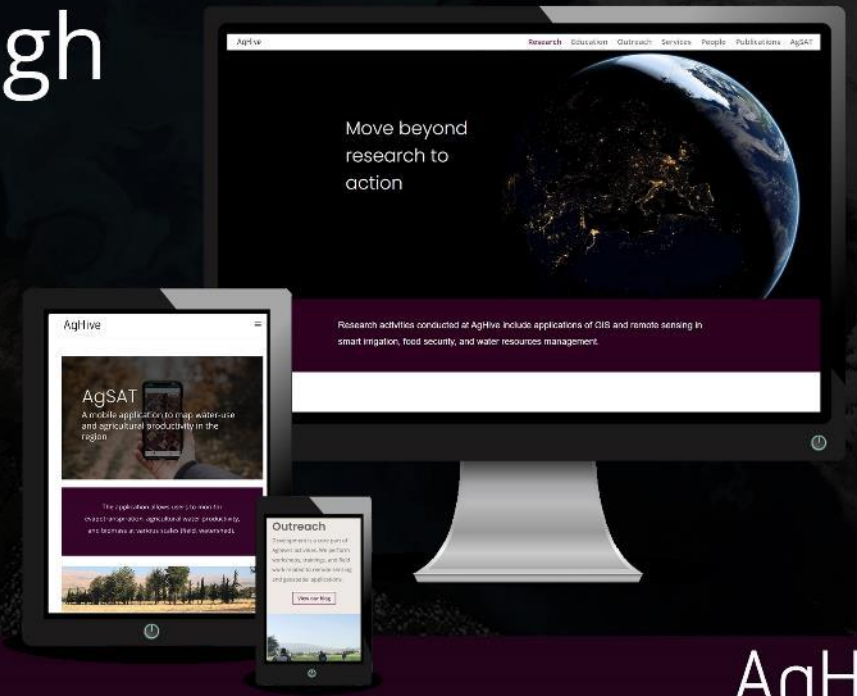
# 2. How to Prioritize Tech

| | | |
|---|---|---|
| **Affordability - Capital investment** | The initial cost to establish the technology. | **Very low (1)**<br>**Low (2)**<br>**Medium (3)**<br>**High (4)**<br>**Very High (5)** |
| **Affordability – Low operational cost** | The annual maintenance and operational costs. | |
| **Importance of economic impact** | Increase of income/profit at utility or ministry or customer level<br>Number of beneficiaries/covered areas<br>Economic importance of targeted application | |

| | | |
|---|---|---|
| **Improvement of resilience to climate** | The technology's ability on improving resilience under current and future climate scenarios. | |
| **Technology capability and suitability** | It assesses how much the technology is widely applicable. If it is applicable for different regions, and suitable for different geographical contexts, it is higher scored. It highlights the degree of viability of the technology. | **Very low (1)**<br>**Low (2)**<br>**Medium (3)**<br>**High (4)**<br>**Very High (5)** |
| **Social/Institutional suitability for Lebanon** | Social acceptance at all levels: users and social suitability, organizational requirements and institutional arrangements at decision-maker level. | |
| **Human resources readiness** | Human requirements and their qualification, coupled with the capacity building and technology/information transfer needed to deploy the technology. It highlights the time requirement to establish and disseminate the technology. | |

# Access the full list of projects and publications on our website

See the world through AgHive

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AgHive

# THANK YOU!

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