La teledetección como herramienta para la gestión sostenible y la transformación de la agricultura.

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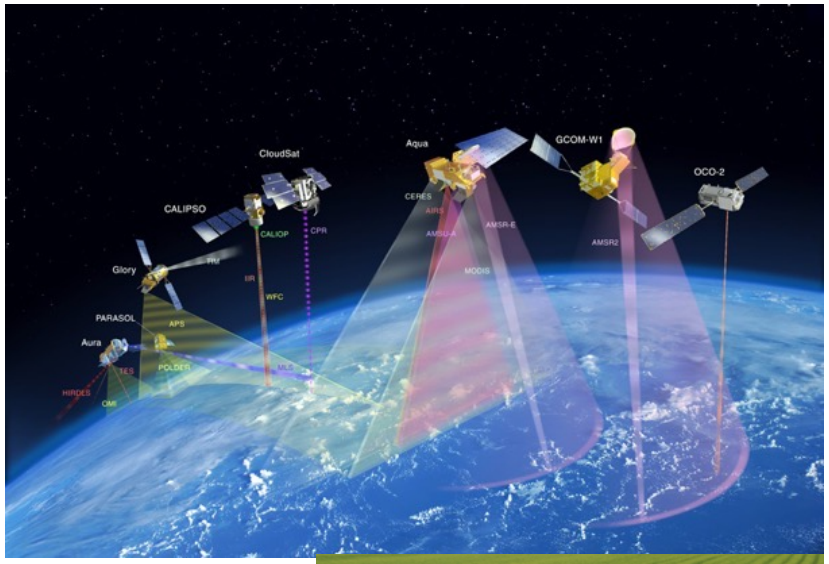
Profesora titular del Departamento de Física de la Terra y Termodinámica de la Universitat de València
Profesora adjunta de la Universidad de Maryland
Science Colaborator de NASA

Italo Moletto Lobos, Fatima Della Bellver, Javier Tarin Mestre, Katarzyna Cyran, César Guerrero Benavent, Andreu Guillem Valls
Global Change Unit, Image Processing Laboratory, Universitat de Valencia

La teledetección

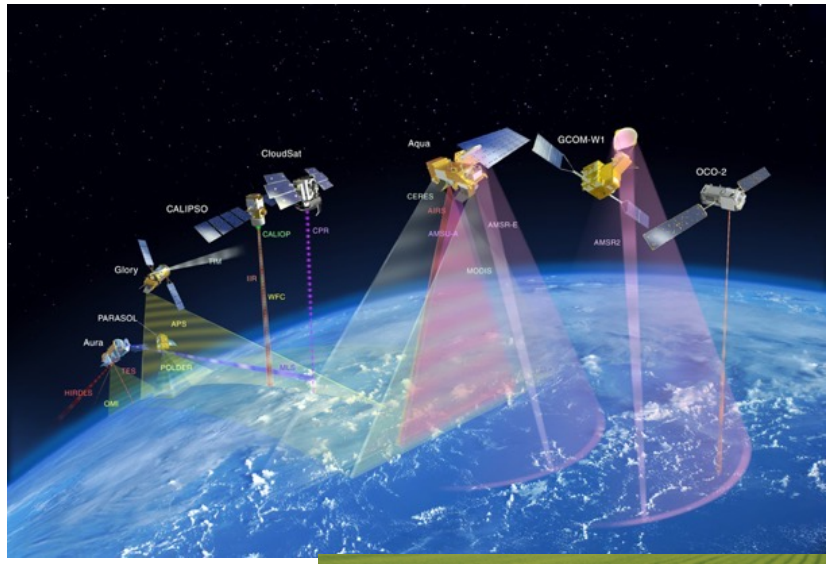
Sensores a bordo de satélites…



… o drones

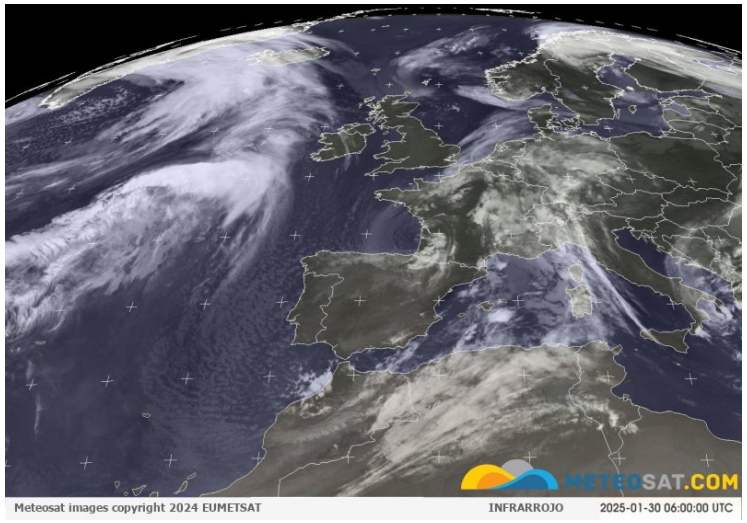
La teledetección

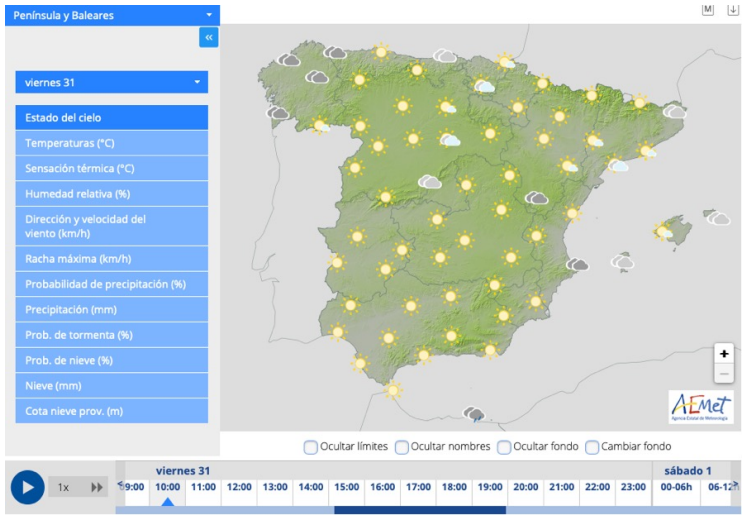
Sensores a bordo de satélites…



… o drones

No solo utilizada para las predicciones meteorologicas!





La teledetección

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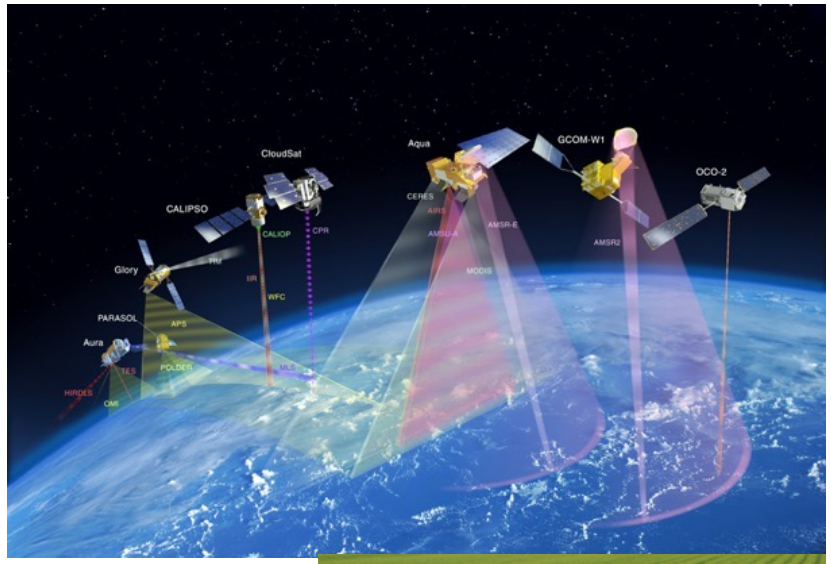

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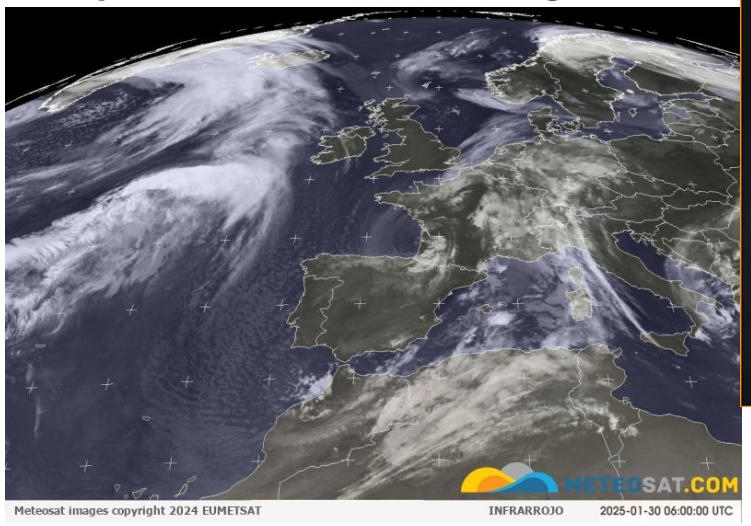
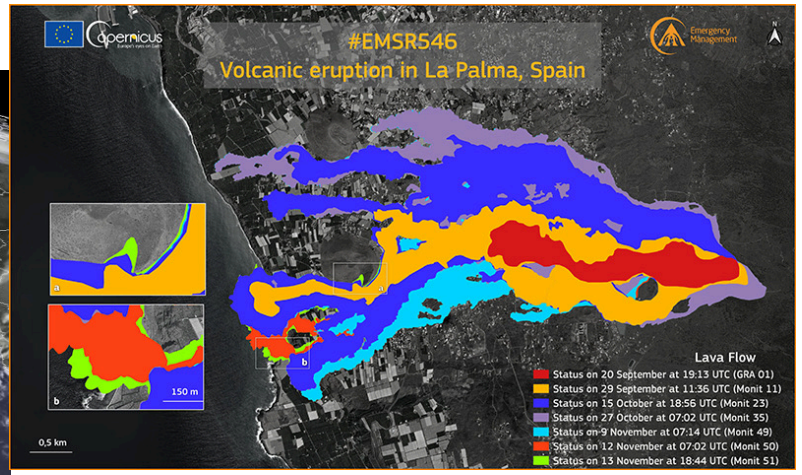
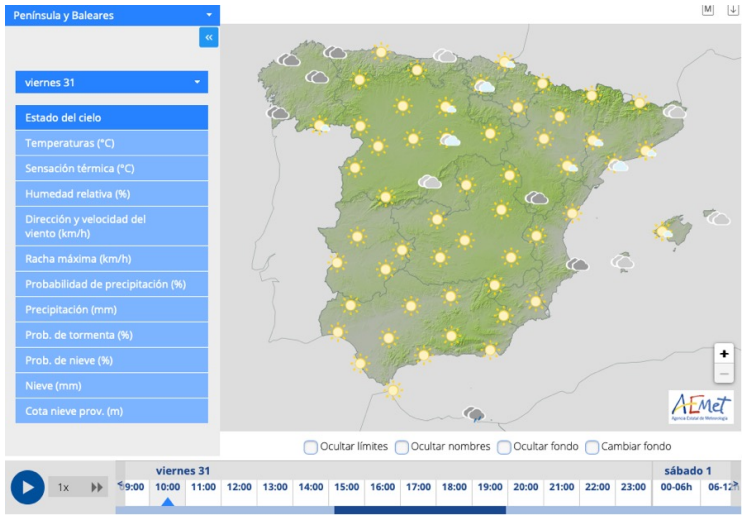




... o drones



La teledetección

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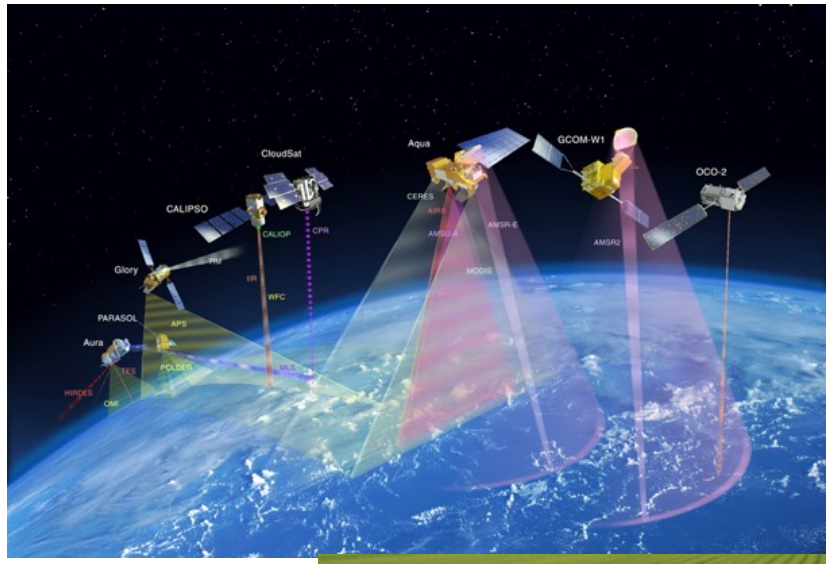

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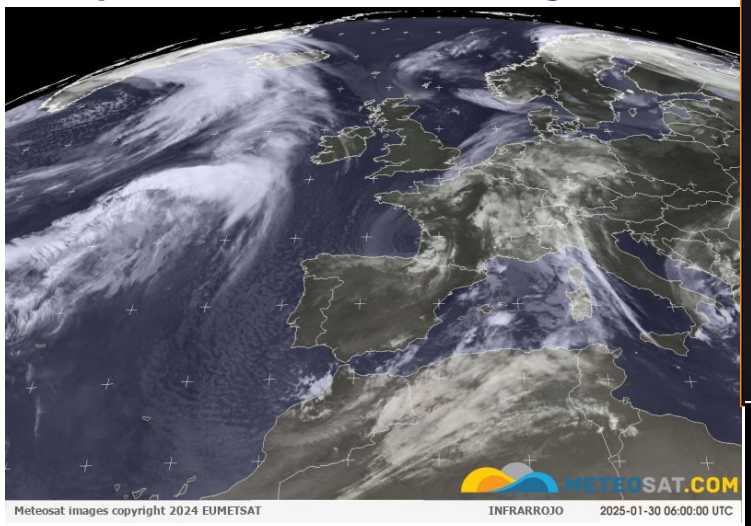

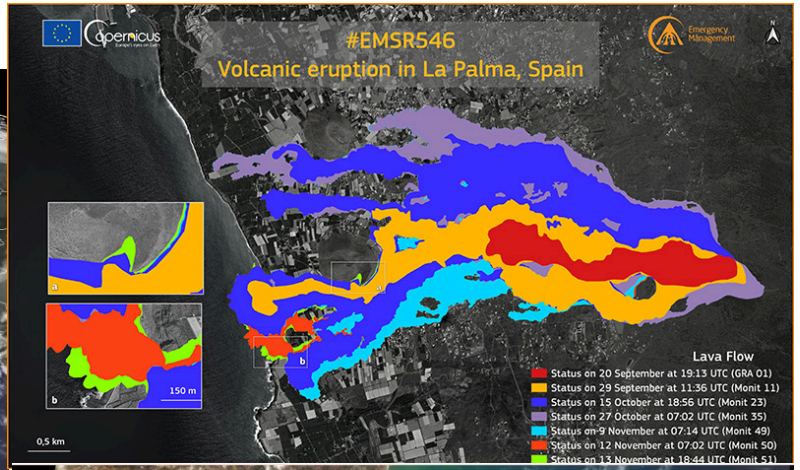

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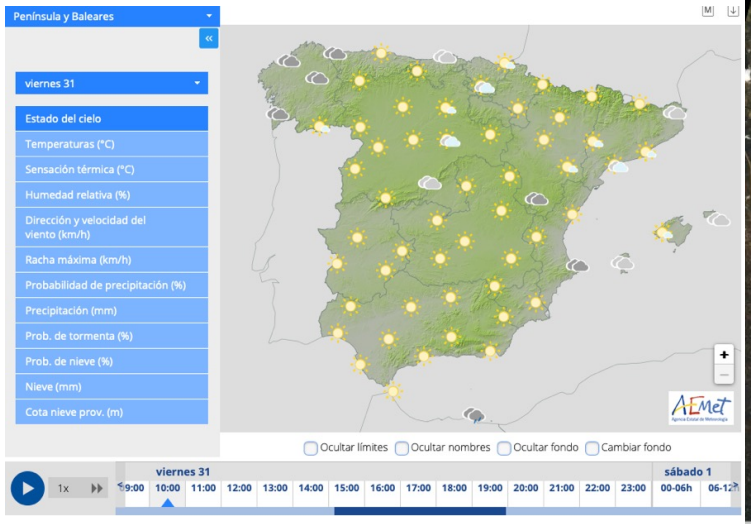
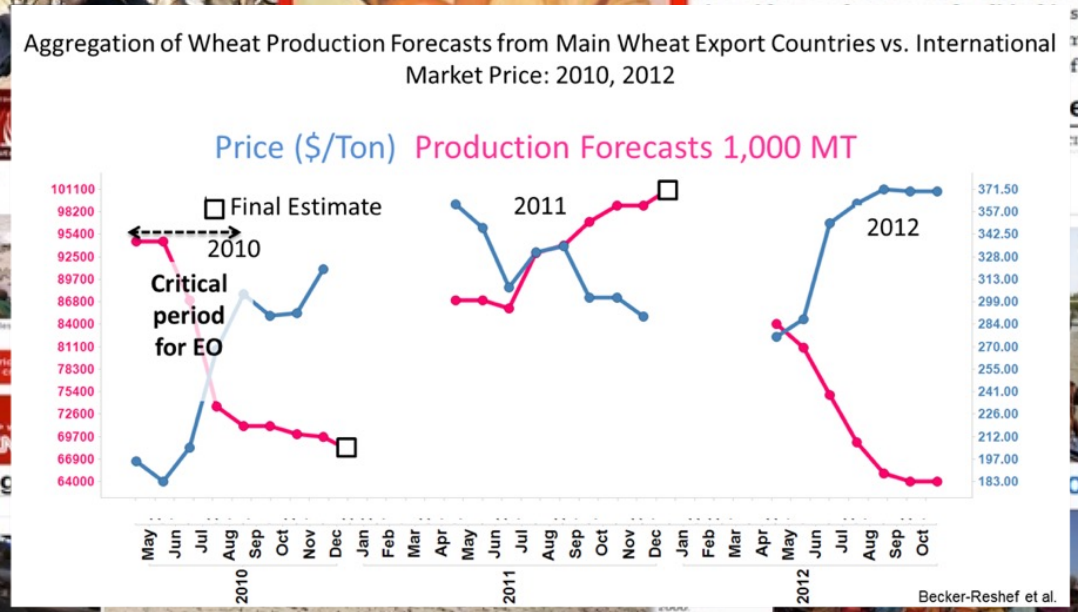


A nivel global: mejorar la información abierta, fiable y en tiempo real sobre las perspectivas de la producción agrícola mundial.

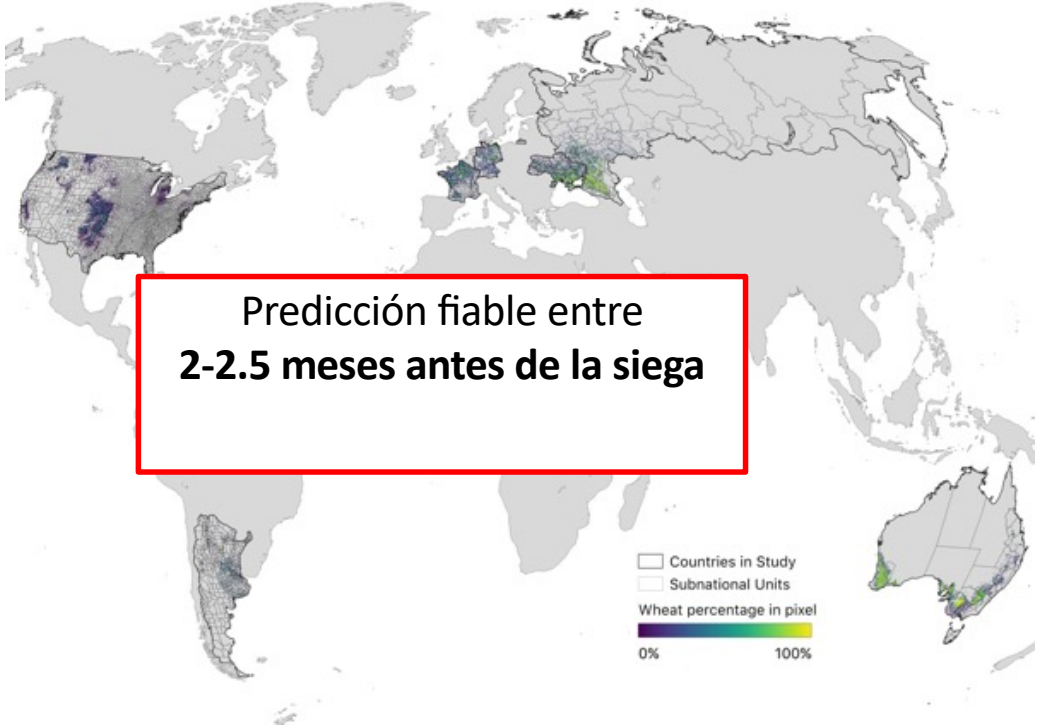
HARVEST — EARTH DATA FOR INFORMED AGRICULTURAL DECISIONS

GEOGLAM — Global Agricultural Monitoring

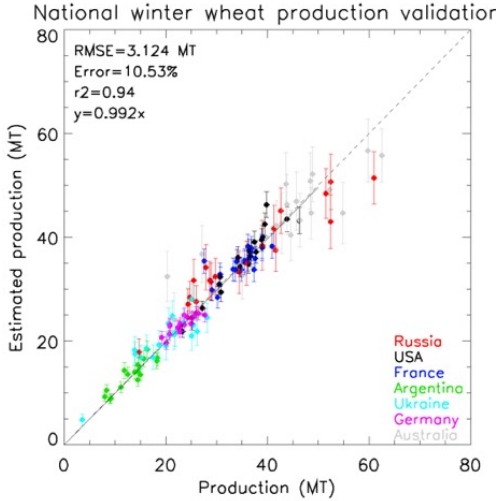


Predicción de la producción/rendimiento de los cultivos

ARYA AGRICULTURE REMOTELY SENSED YIELD ALGORITHM



Predicción fiable entre
2-2.5 meses antes de la siega



"En el pasado, siempre **reaccionábamos** ante la **mala cosecha**, gastando miles de millones de chelines para proporcionar ayuda alimentaria en la región.
2017 fue la primera vez que actuamos de manera proactiva porque teníamos **evidencia** clara de los datos de satélite **muy temprano en la temporada**".

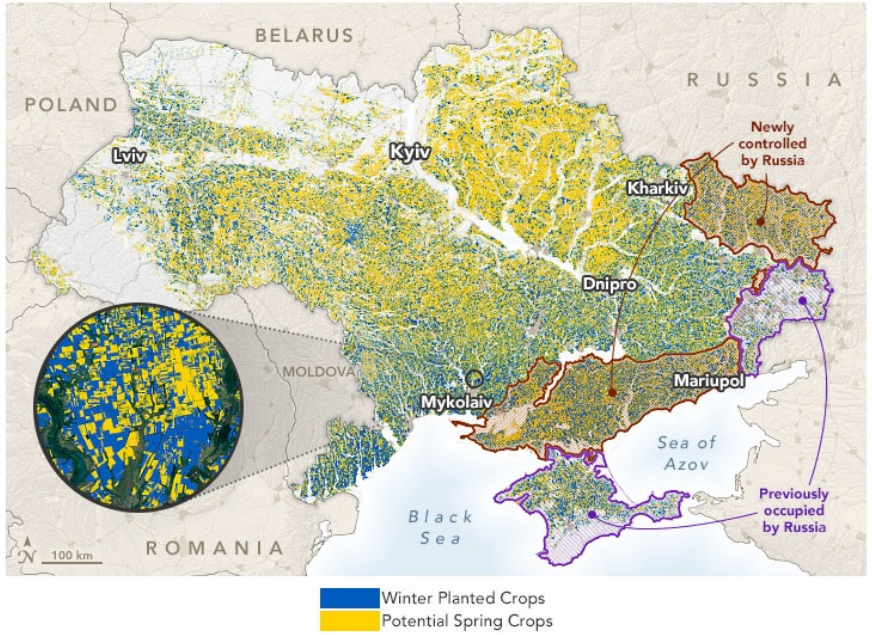
Martin Owor, Comisionado
Oficina del Primer Ministro (OPM) - Uganda

$2,6 millones ahorrados,
Ayudas a 290 000 personas

B. Franch, E. Vermote, S. Skakun, A. Santamaria-Artigas, N. Kalecinski, J.-C. Roger, I. Becker-Reshef, B. Barker, C. Justice, J.A. Sobrino (2021). The ARYA crop yield forecasting algorithm: Application to the main wheat exporting countries. International Journal of Applied Earth Observation and Geoinformation,Vol 104, 102552

Images | Global Maps | Articles | Blogs | earth observatory | EO Explorer | Top

Measuring War's Effect on a Global Breadbasket



2022 JPEG

View this area in EO Explorer

NASA Harvest researchers are using satellite observations and economic data to track how the Russia-Ukraine conflict is disrupting the global food system.

Image of the Day for July 1, 2022

Instruments:
In situ Measurement
Landsat 8 — OLI
Photograph
Planet Labs — Cubesat

Appears in these Collections:

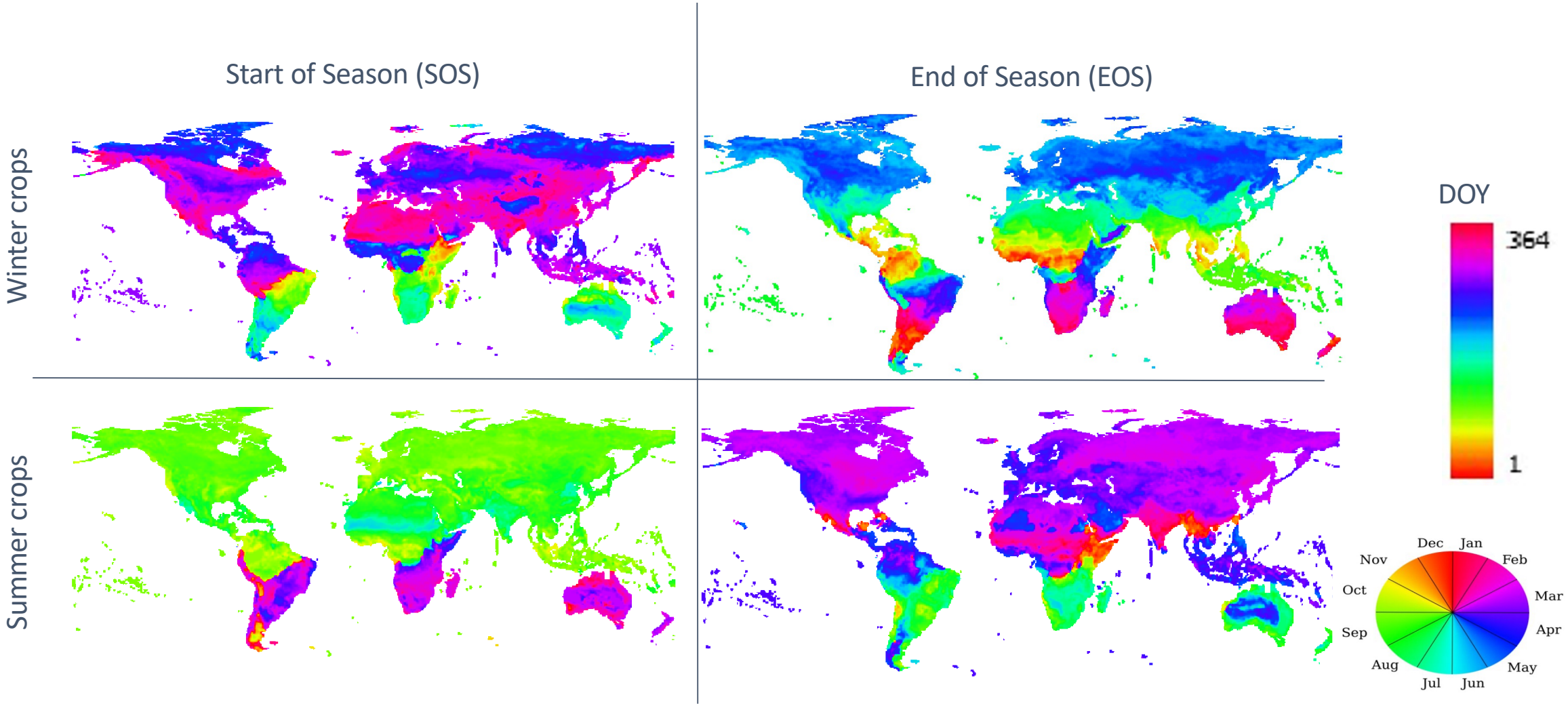
https://earthobservatory.nasa.gov/images/150025/measuring-wars-effect-on-a-global-breadbasket

The researchers have also developed models, such as the Agriculture Remotely-Sensed Yield Algorithm (ARYA), that anticipate yields by blending measures of NDVI with data about environmental conditions during the growing season from NASA's MERRA-2reanalysis dataset.

"Taking all of that into account, the data indicate that Ukraine is on track for a winter wheat yield of about 4.1 metric tons per hectare. That's not quite as high as the record-breaking wheat crop in 2021, but it's still a sizable crop given the circumstances."

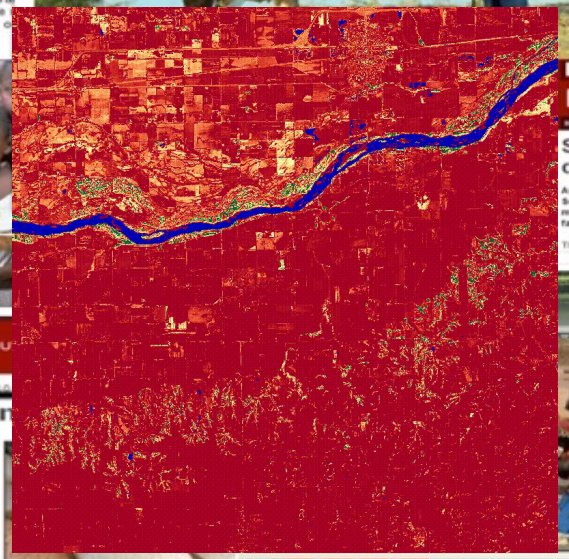
WorldCereal

Desarrollo de calendarios de cultivos estacionales genéricos a nivel global



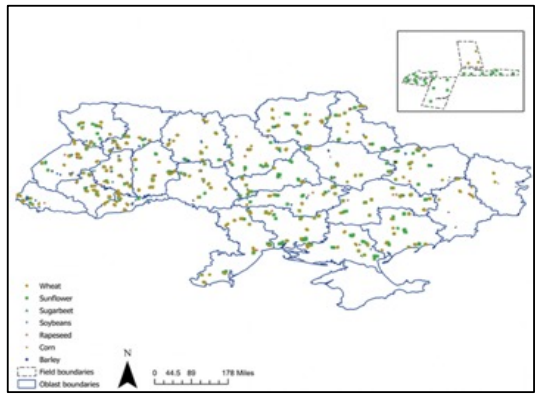
A nivel de campo: mejorar la gestión de los recursos agrícolas y reducir su impacto ambiental.

Para MEJORAR la PRODUCTIVIDAD agrícola y hacerla más SOSTENIBLE



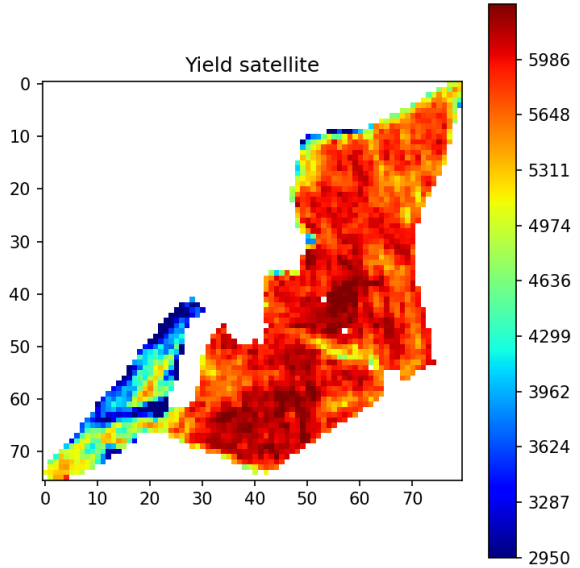
Prediccion de la produccion/rendimiento de los cereales a nivel de parcela

Compañias de seguros: visitas campos donde se toman muestras de rendimiento

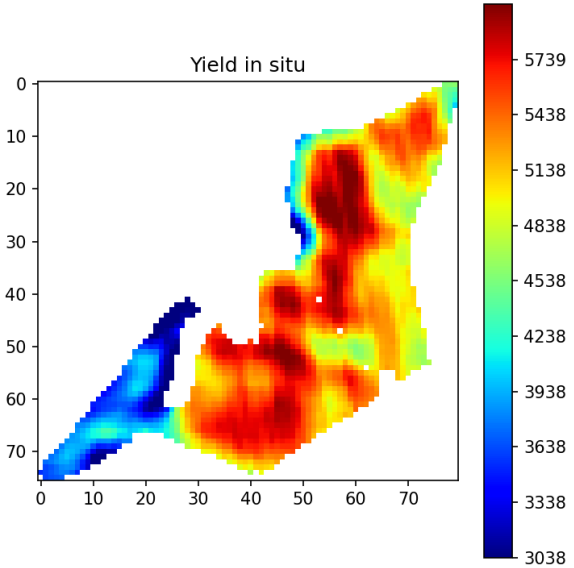


La teledeteccion ahorró el 20% de los costes, reduciendo al 50% el numero de visitas a campos

Rendimiento simulado mediante satellite (principios Mayo)

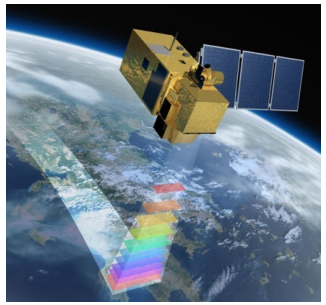


Medidas durante la siega (Julio)

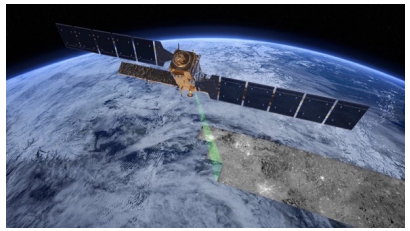


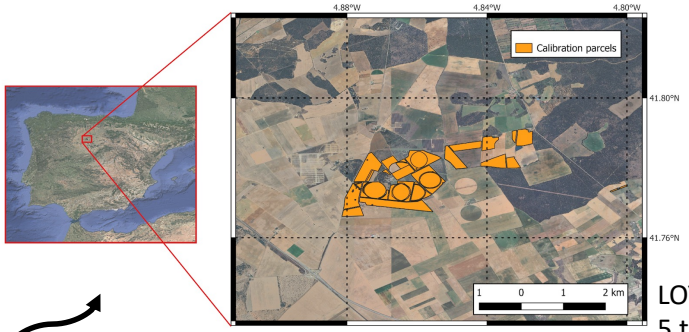
Prediccion de la produccion/rendimiento de TRIGO a nivel de parcela

Sentinel-2 (optico)



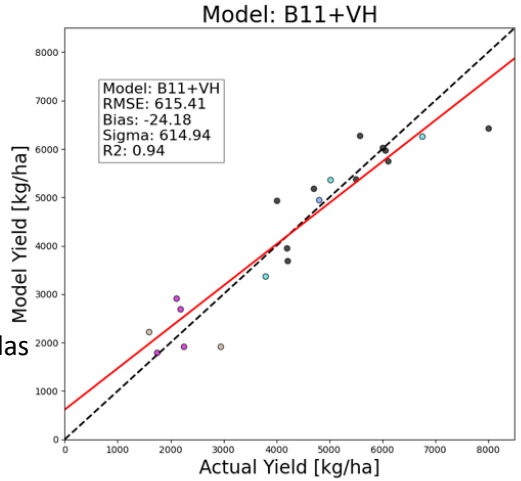
Sentinel-1 (SAR)

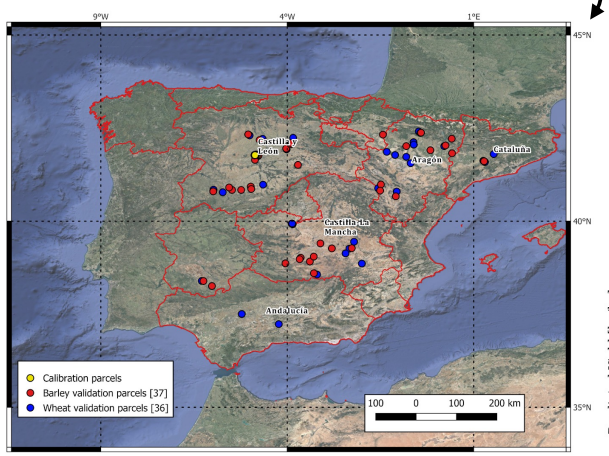


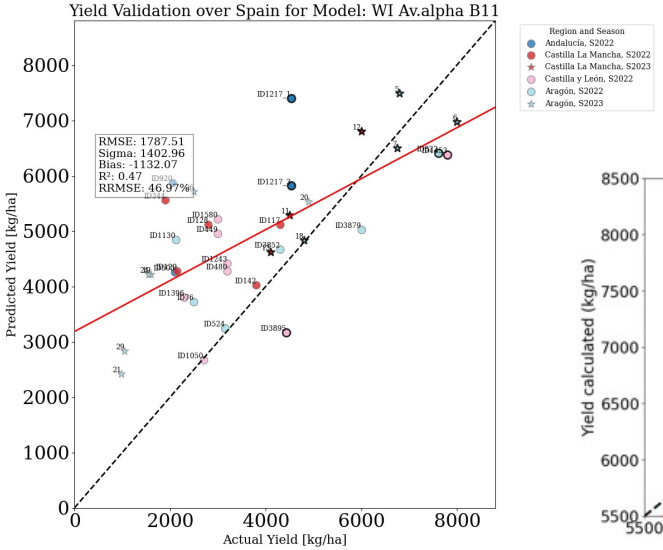


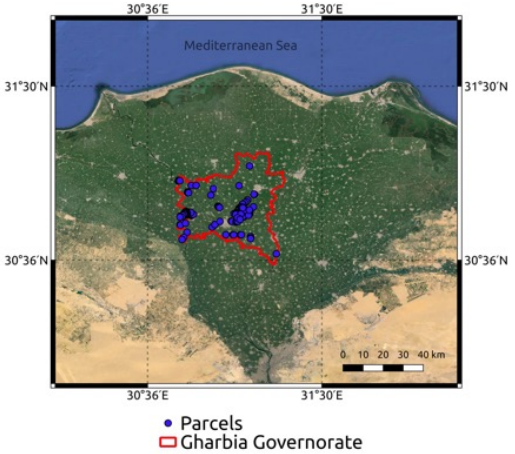
LOYO de
5 temporadas

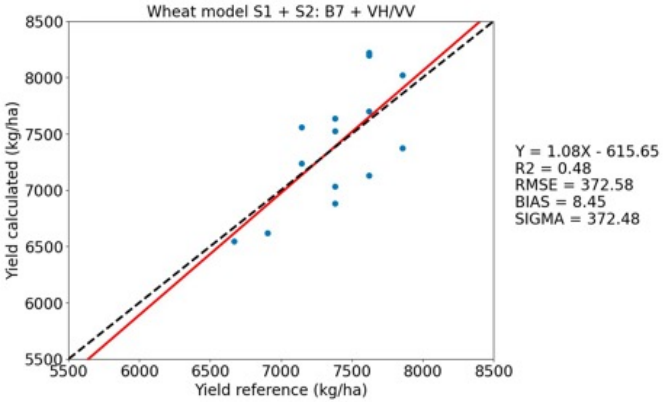
Calibracion & validacion











UCANE
(2021-2023) ESA

Predic-Pro
(2022-2025)
Ministerio Innovacion

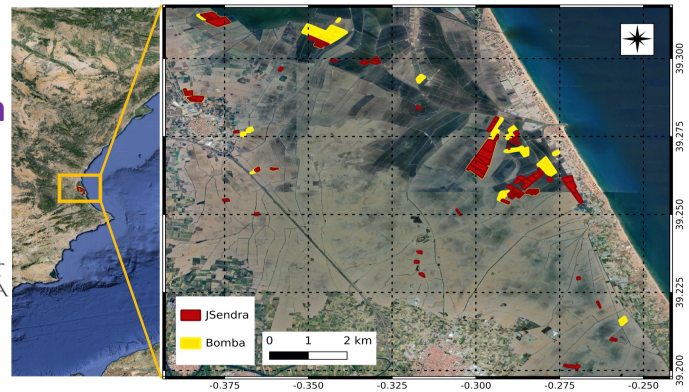
FERTINAGRO BIOTECH

UNIVERSITAT POLITÈCNICA DE VALÈNCIA

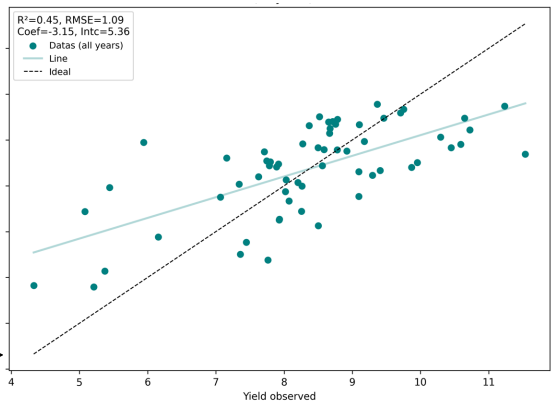
VNIVERSITAT DE VALÈNCIA

Prediccion de la produccion/rendimiento de ARROZ a nivel de campo

BestRice (2021-2024) Ministerio Innovacion



LOYO de 5 temporadas

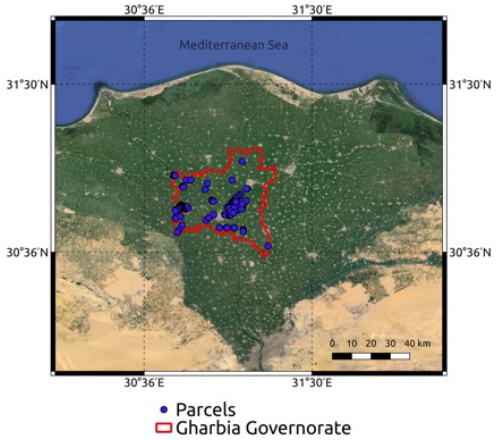


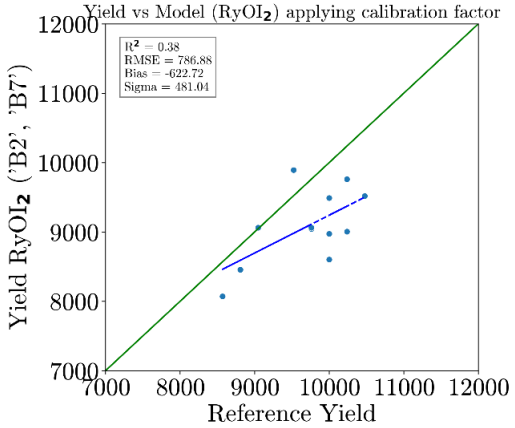
Calibracion & validacion

Validacion en Delta del Ebro (Tarragona)

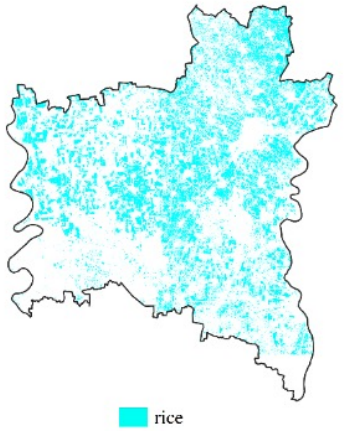
UCANE (2021-2023) ESA

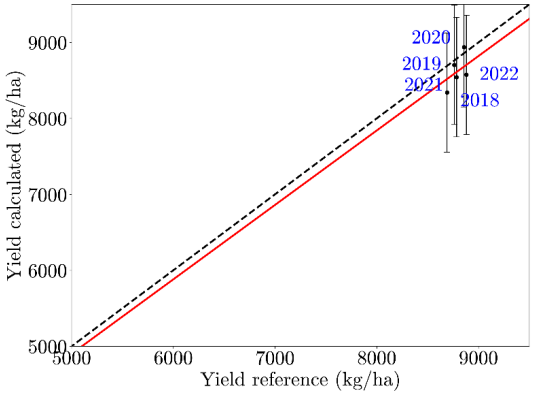
EO AFRICA





Agregado a nivel Governorate





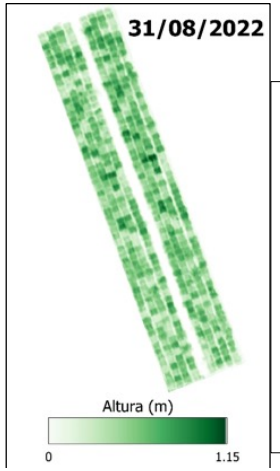
Y = 0.98X + 0.0
R2 = 0.41
RMSE = 272.59
BIAS = -175.55
SIGMA = 208.53

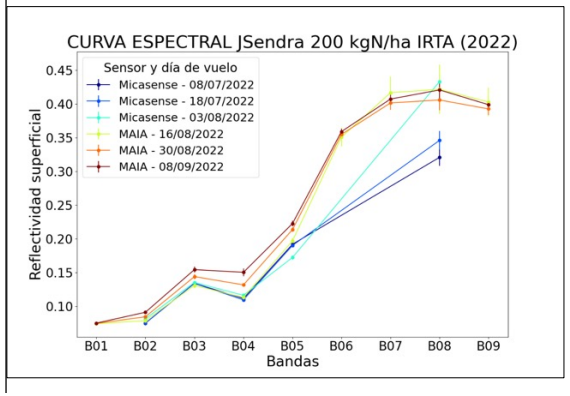
Otras aplicaciones agrícolas (ARROZ)

Identificación de las mejores variedades de arroz

BestRice - IVIA (Valencia)

BestRice - IRTA (Amposta)





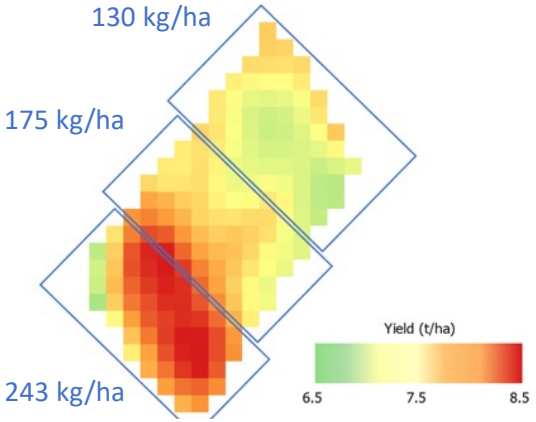
BestRice (2021-2024) Ministerio Innovacion

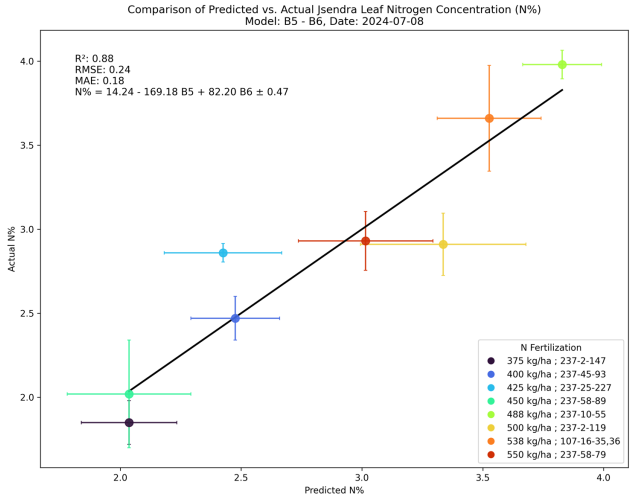
Optimizacion fertilizacion y deteccion de la Pyricularia

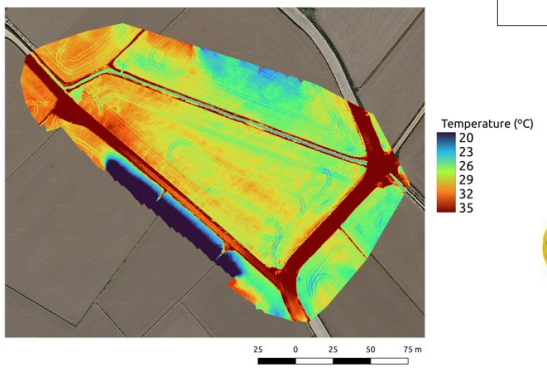
15 parcelas de la variedad Jsendra a tres niveles de fertilizacion (baja, media y alta)

Uso de satelites Sentinel-2, PlanetScope y EnMap

Medidas nitrogeno en hoja e hiperespectrales







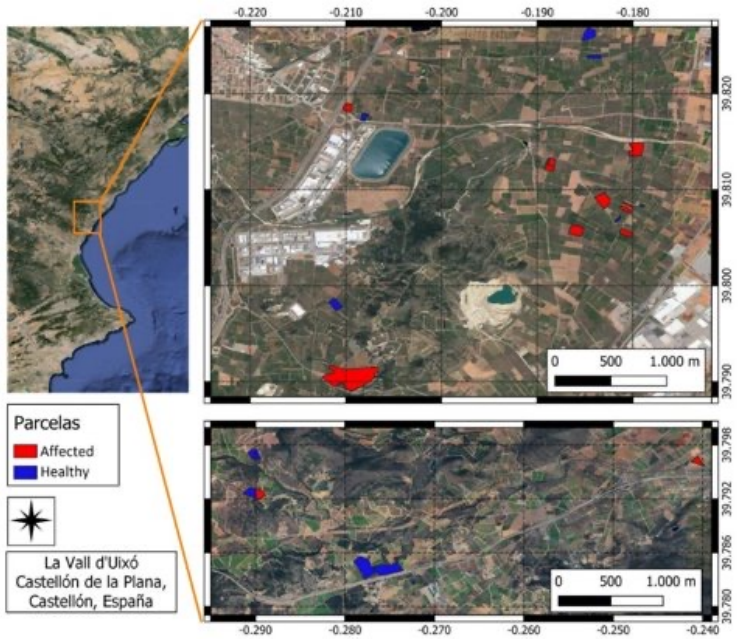
DETECTORYZA (2022-2024) AVI

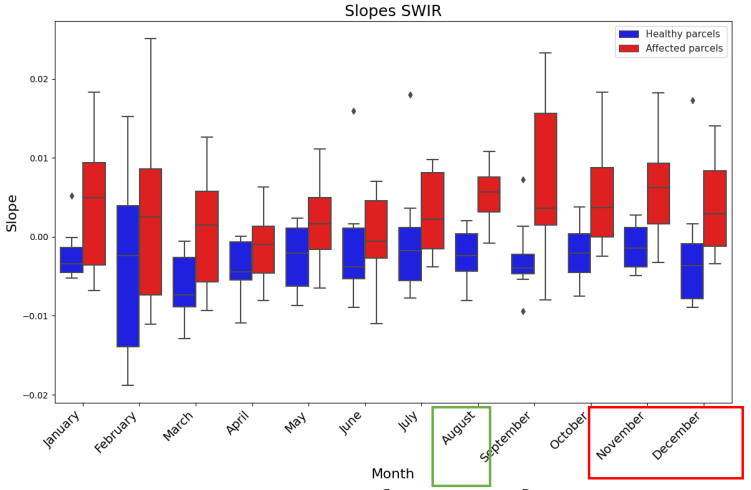
Otras aplicaciones agrícolas (CITRICOS)

Detección de Cotonet en cítricos

AGROALNEXT

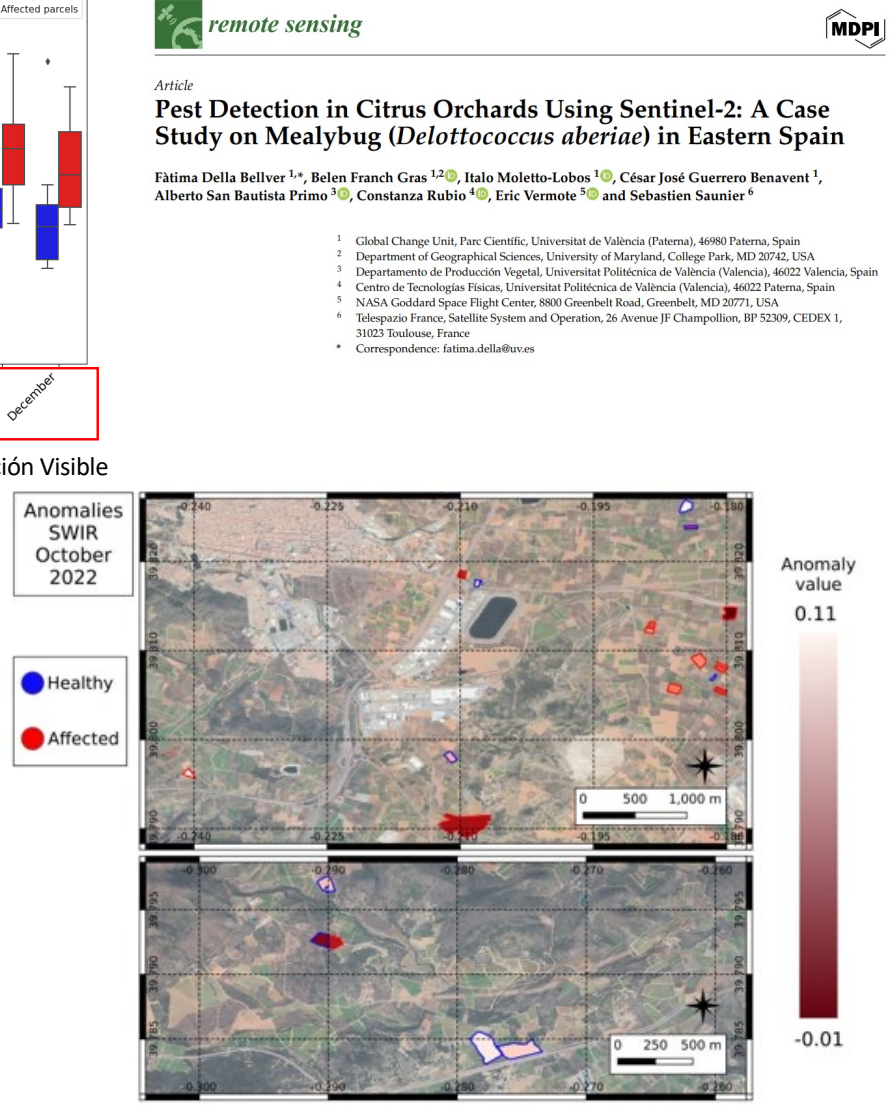
Plan complementario de Agroalimentación





Afección Visible

Tratamientos



remote sensing

MDPI

Article

Pest Detection in Citrus Orchards Using Sentinel-2: A Case Study on Mealybug (*Delottococcus aberiae*) in Eastern Spain

Fàtima Della Bellver [1,*], Belen Franch Gras [1,2], Italo Moletto-Lobos [1], César José Guerrero Benavent [1], Alberto San Bautista Primo [3], Constanza Rubio [4], Eric Vermote [5] and Sebastien Saunier [6]

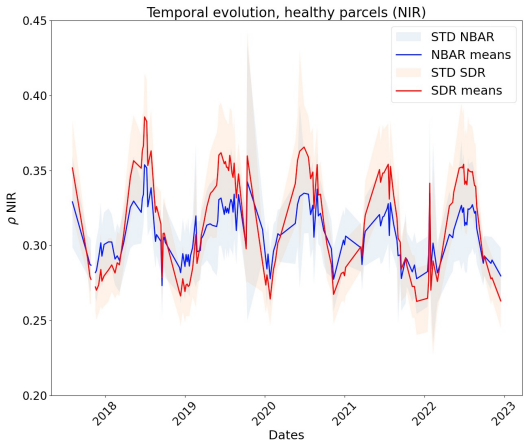
1 Global Change Unit, Parc Científic, Universitat de València (Paterna), 46980 Paterna, Spain
2 Department of Geographical Sciences, University of Maryland, College Park, MD 20742, USA
3 Departamento de Producción Vegetal, Universitat Politècnica de València (Valencia), 46022 Valencia, Spain
4 Centro de Tecnologías Físicas, Universitat Politècnica de València (Valencia), 46022 Paterna, Spain
5 NASA Goddard Space Flight Center, 8800 Greenbelt Road, Greenbelt, MD 20771, USA
6 Telespazio France, Satellite System and Operation, 26 Avenue JF Champollion, BP 52309, CEDEX 1, 31023 Toulouse, France
* Correspondence: fatima.della@uv.es

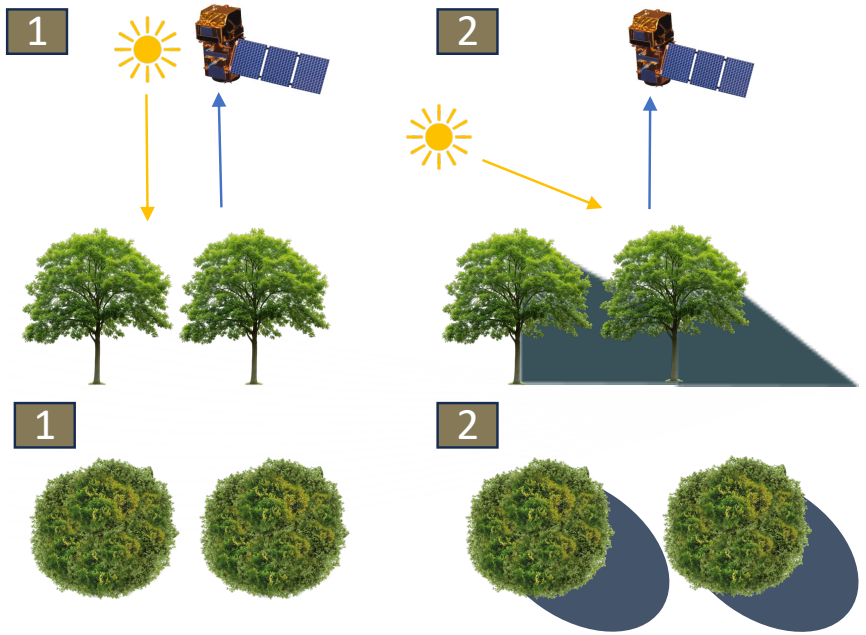
Otras aplicaciones agrícolas (CITRICOS)

Detección de Cotonet en cítricos

AGROALNEXT

Plan complementario de Agroalimentación



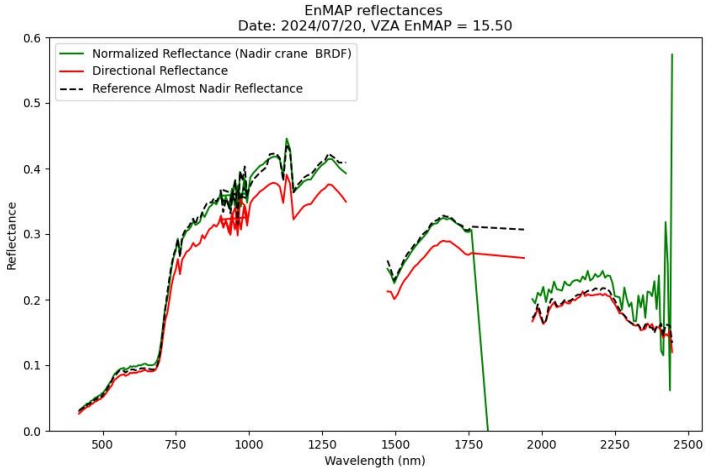


AVA ASAJA ASSOCIACIÓ VALENCIANA D'AGRICULTORS

SINYENT ENSAYOS Y DESARROLLOS AGRARIOS

DLR

EnMAP



Nueva era: monitorización de la Agricultura desde Satélite

- Datos de satélite: objetivos, inmediatos, globales y económicos.
- Teledetección: papel fundamental en la modernización de las técnicas agrícolas.
- Esencial colaboración publico-privada para nutrir los modelos con datos y expandir el impacto de nuestras investigaciones