Using remote sensing for detecting the global impact of climate extremes on vegetation and improving drought monitoring programs

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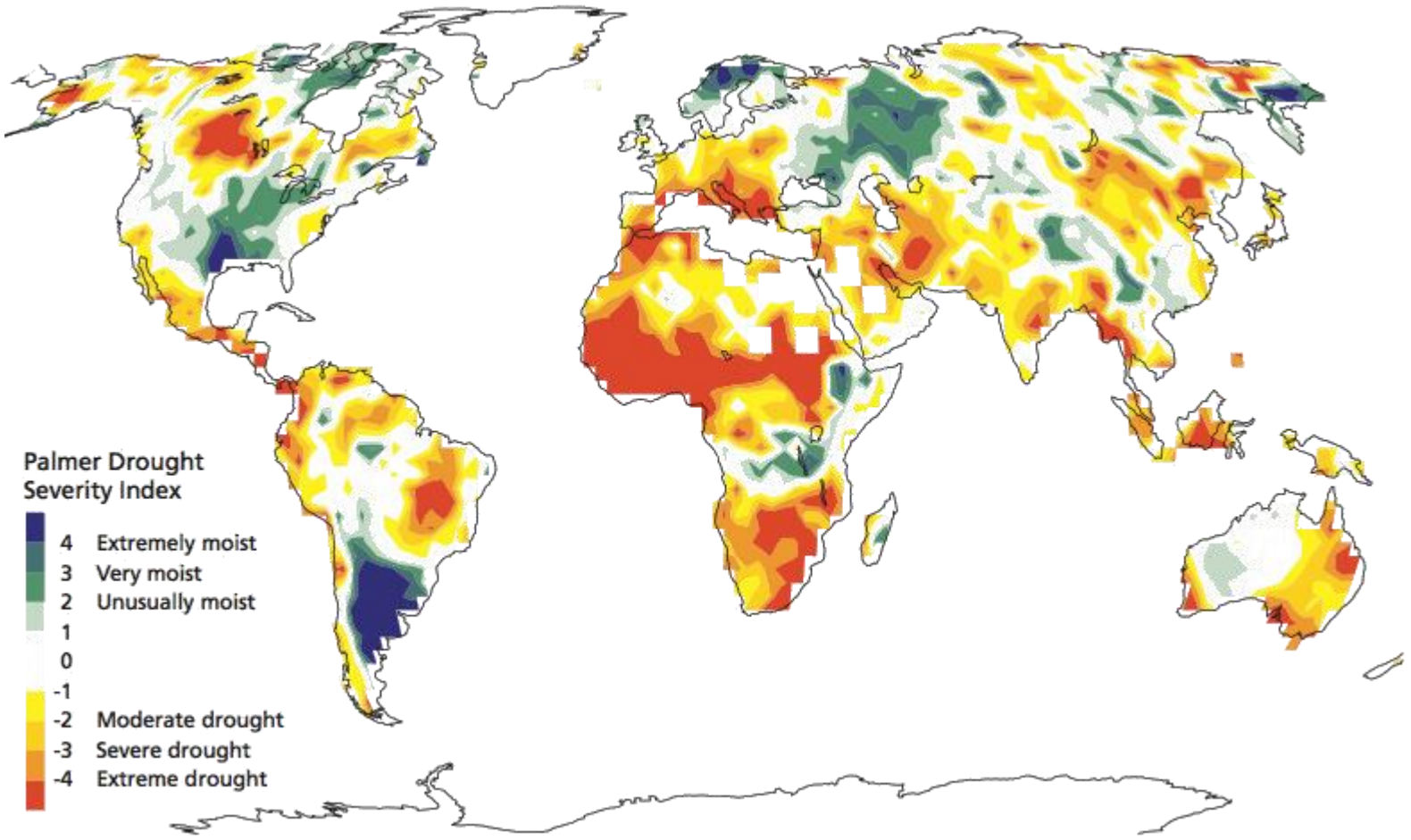
Problem Statement

Drought is an important problem in many areas of the world



Problem Statement

Drought is an important problem in many areas of the world with devastating consequences...

- Is a drought event about to strike?
- Where is it occurring?
- How severe is the drought event?

⇨ **Drought monitoring & early-warning systems**

⇨ **Can remote sensing provide input?**

Drought And Vegetation

Agricultural drought

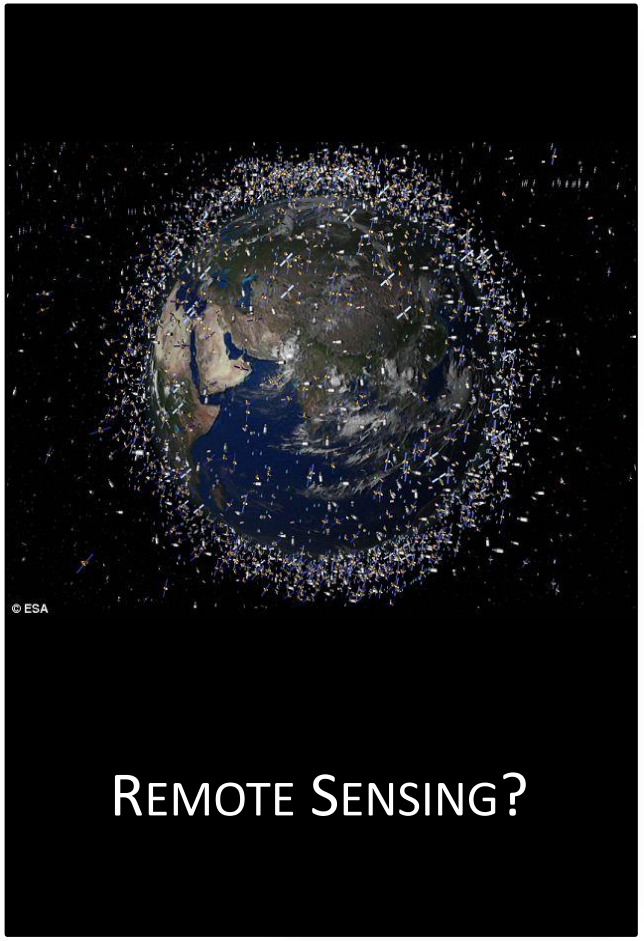
CAUSED BY

low soil moisture contents

reduced transpiration: plant stress

Result:

- **reduced crop production**
- **vegetation die-off**



climate extremes

high temperatures (heat waves)

shortage of precipitation

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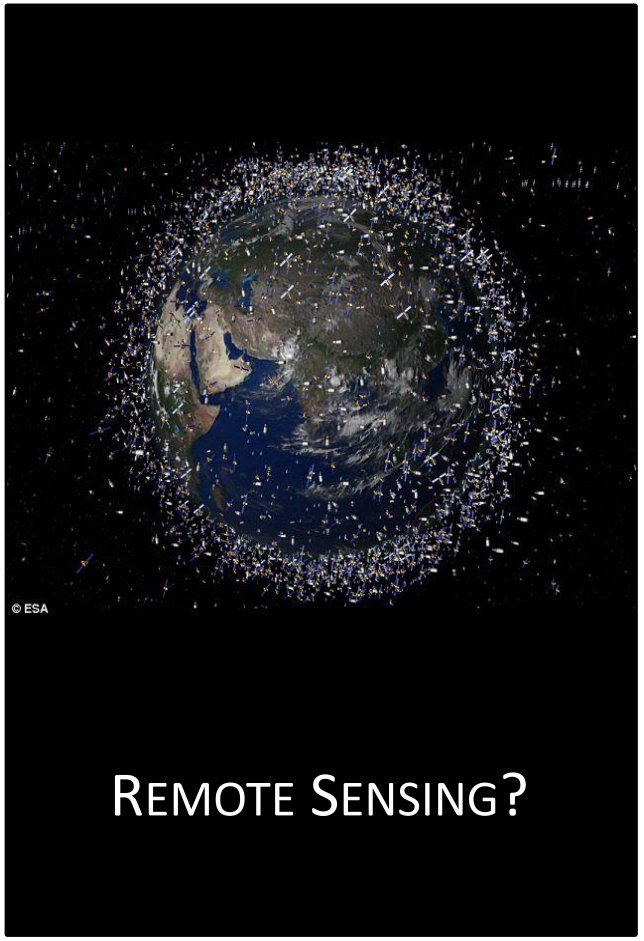

climate extremes

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How is LHWM Using Remote Sensing?

1. To understand how climate and climate extremes influence vegetation

SAT–EX

2. To improve drought monitoring systems

HYDRAS+

esa

smos+hydrology

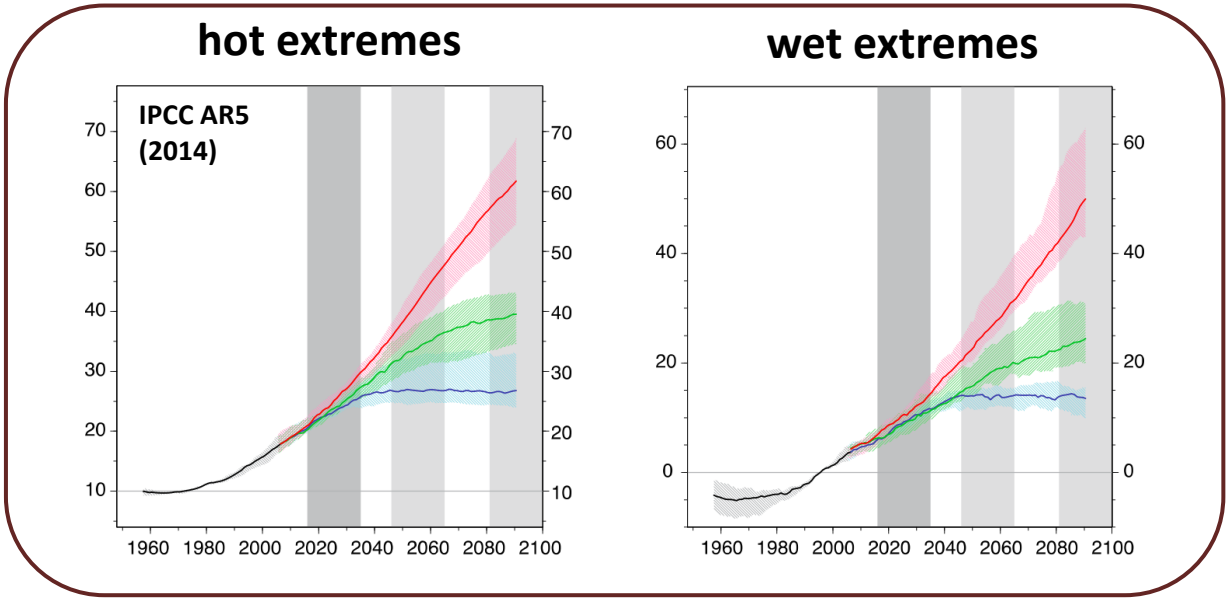
support to science element

3. To improve early-warning systems for vegetation stress

esa smos+ET

STR3S

SAT-EX or How Climate Extremes Link to Vegetation Extremes



what model is 'correct'?

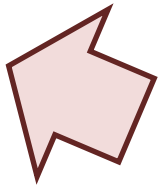
impact on vegetation?

Impact of climate and climate change on vegetation?

SAT-EX or How Climate Extremes Link to Vegetation Extremes

Use satellite observations
to assess past changes in extreme events and their carbon cycle impacts

Use this information to
evaluate climate model
performance



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Statistical analyses and data mining techniques

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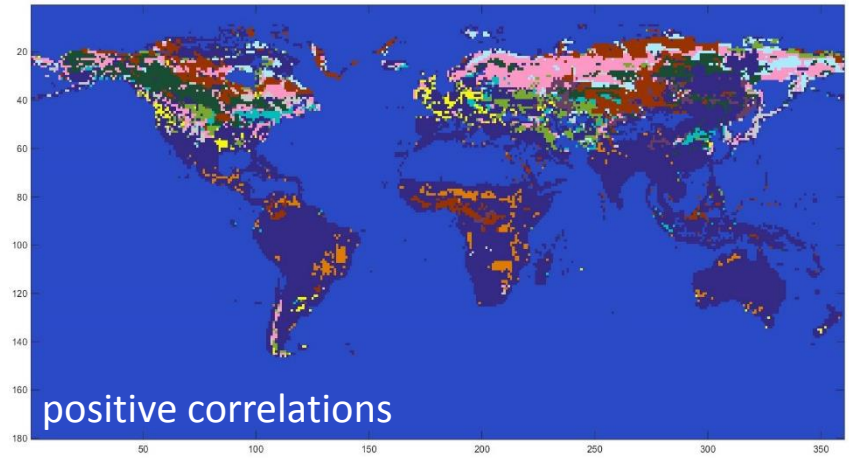
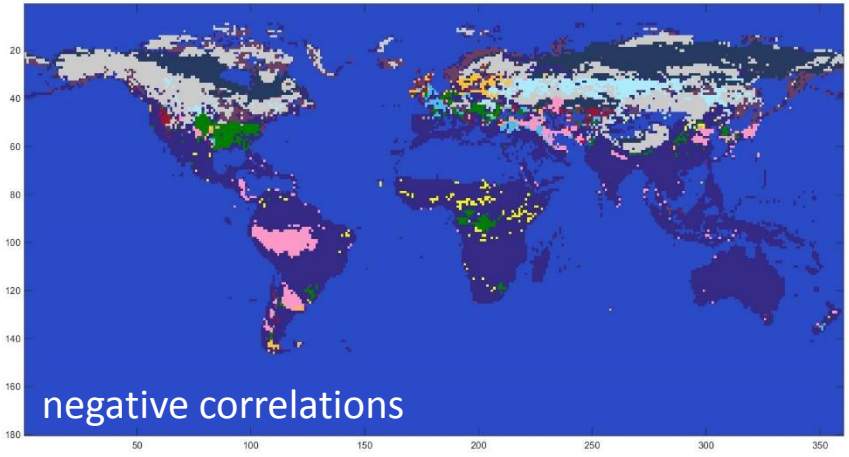
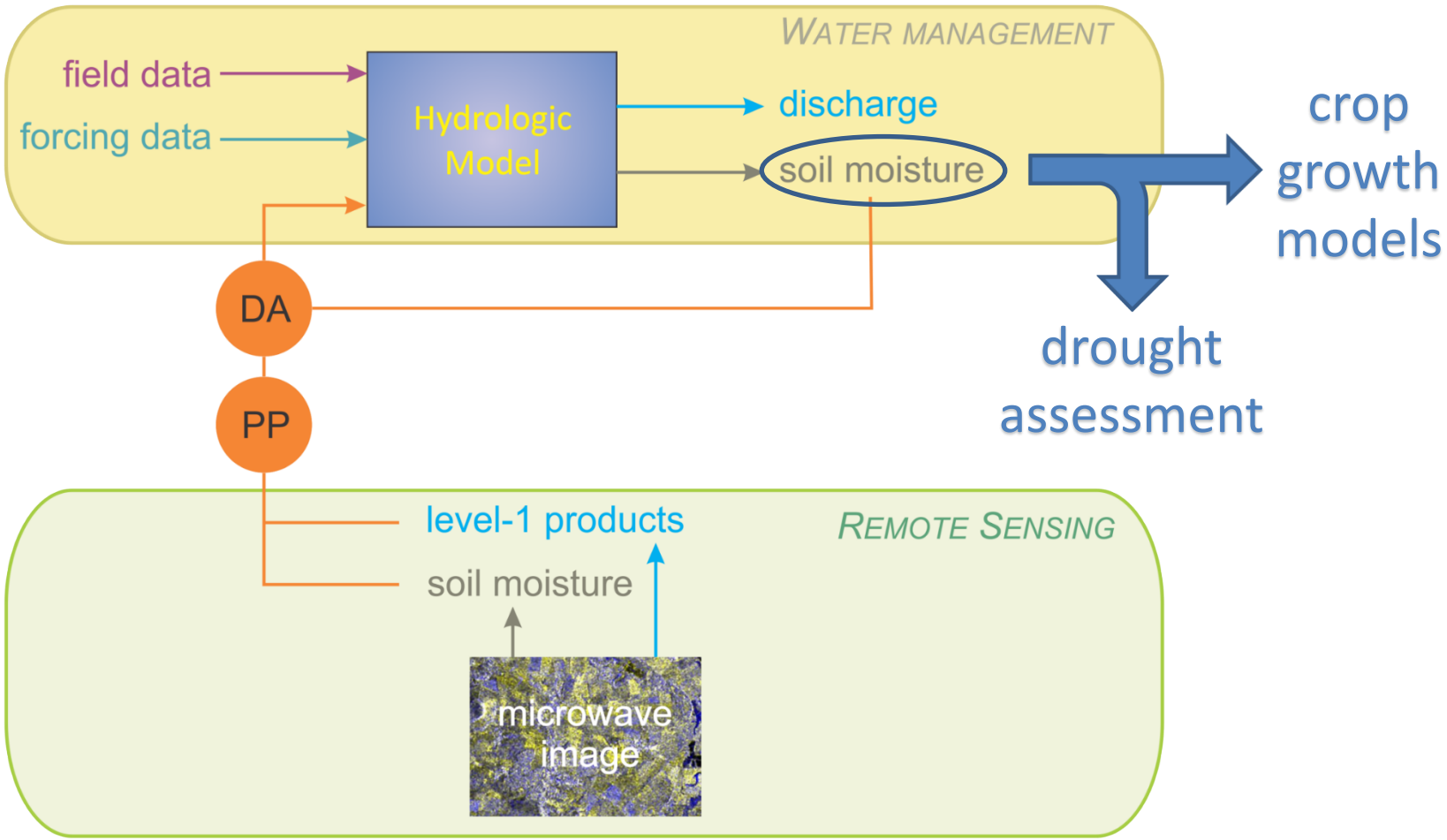




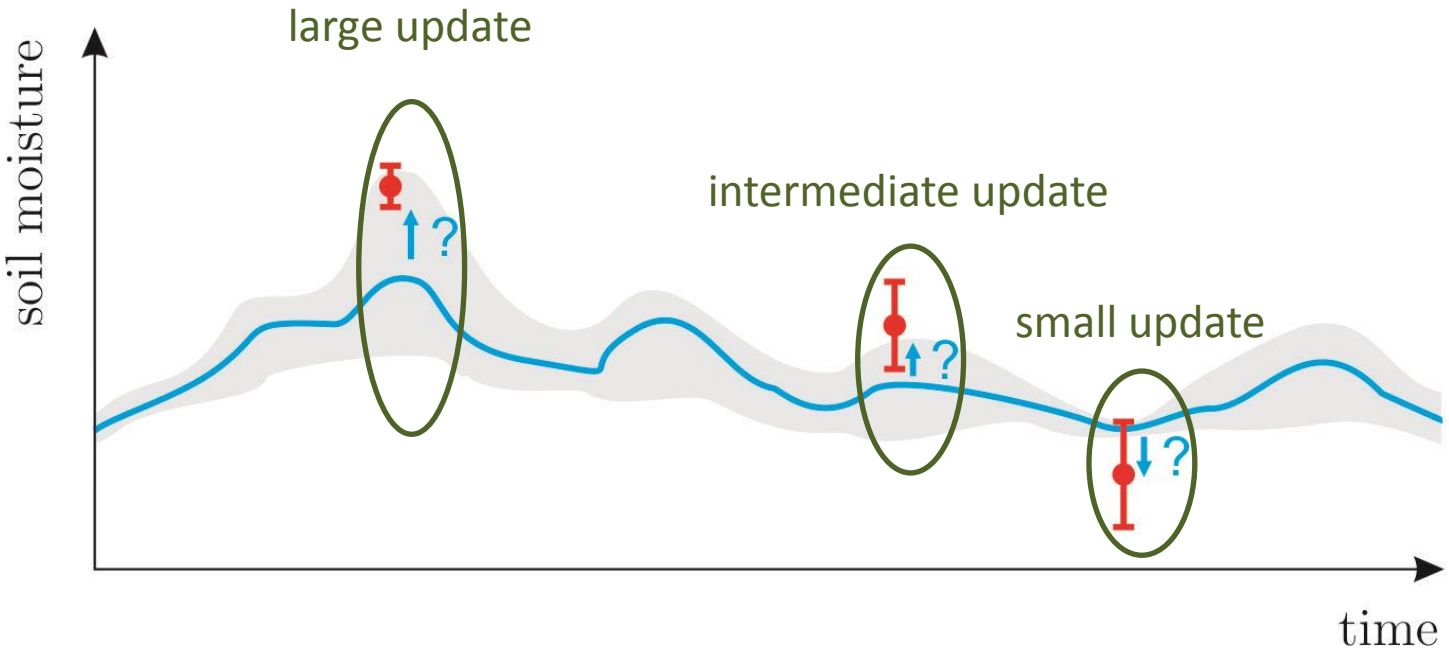
Statistical analyses and data mining techniques

HYDRAS+ OR HOW REMOTE SENSING CAN IMPROVE DROUGHT MONITORING

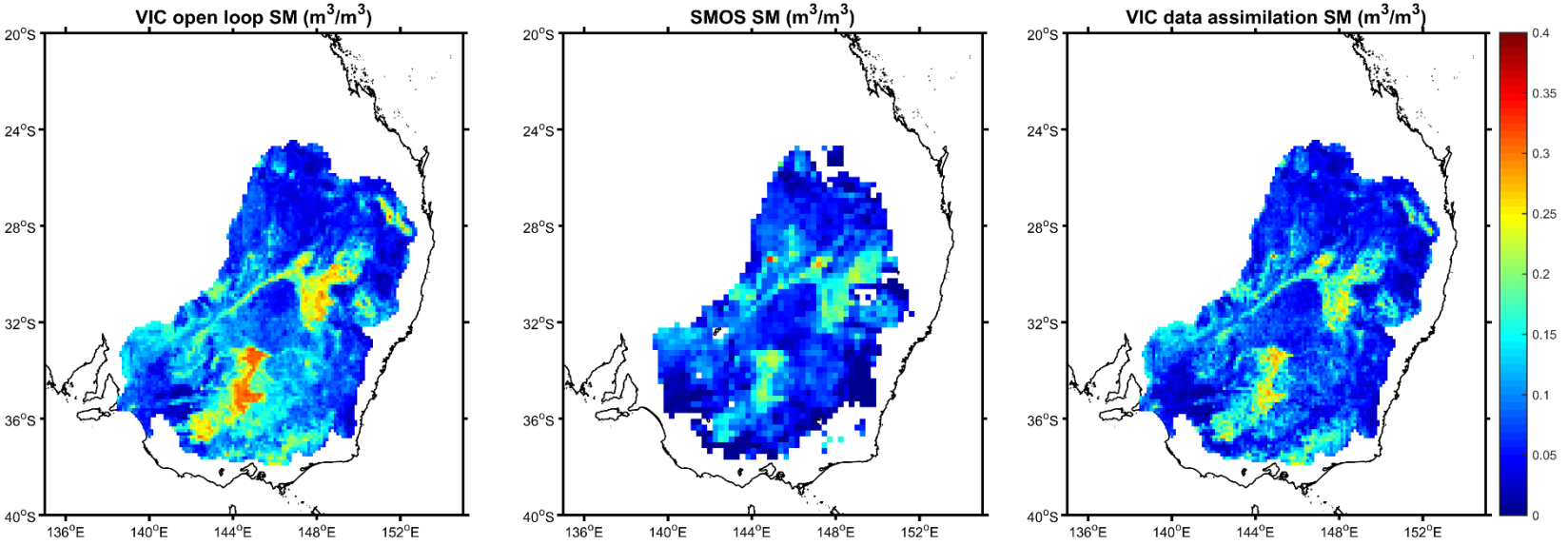


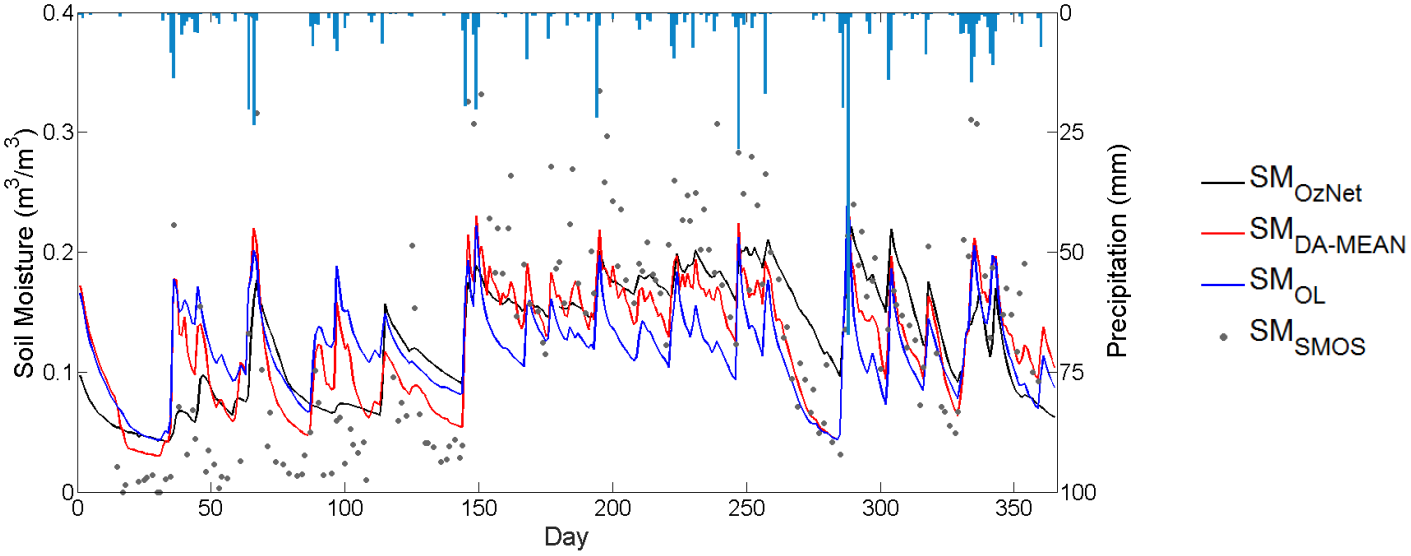
HYDRAS+ OR HOW REMOTE SENSING CAN IMPROVE DROUGHT MONITORING

Using remote sensing observations to steer hydrologic models



HYDRAS+ or How Remote Sensing Can Improve Drought Monitoring





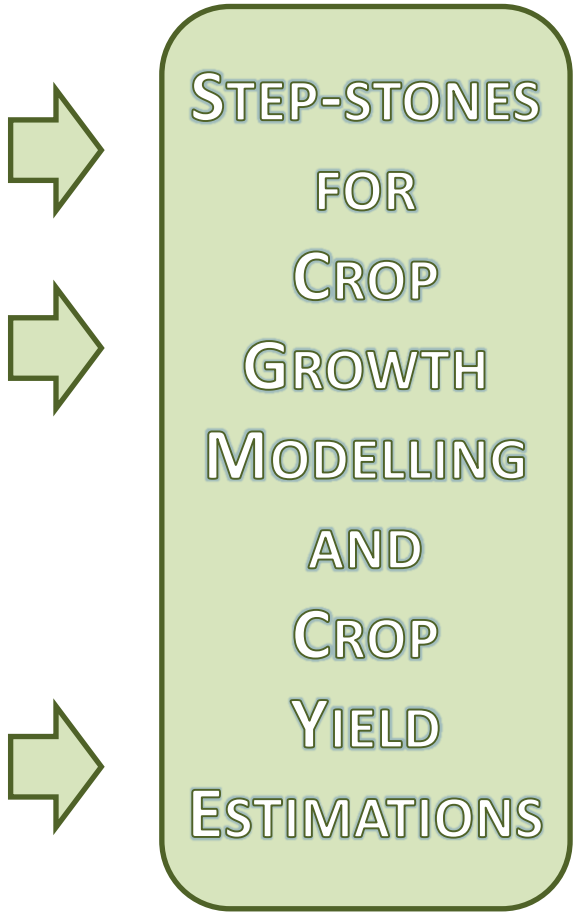
Conclusions

Two ongoing BELSPO projects further explore the potential of remote sensing for understanding and mitigating climate impacts on vegetation:

- ***SAT-EX*** unravels globally climate impacts on vegetation through exploring long-term remotely-sensed datasets
- ***Hydras+*** develops methodologies for improving drought monitoring systems through incorporating a wide variety of remotely-sensed observations

(Near-)Future research:

- Apply remotely-sensed fluorescence observations to assess vegetation stress and use this for estimating vegetation transpiration



More information

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