Characterising Drought in East Africa

Improving datasets and drought indices using Earth observation data.

Supervisors: Professor Simon Dadson; Dr Steven Reece

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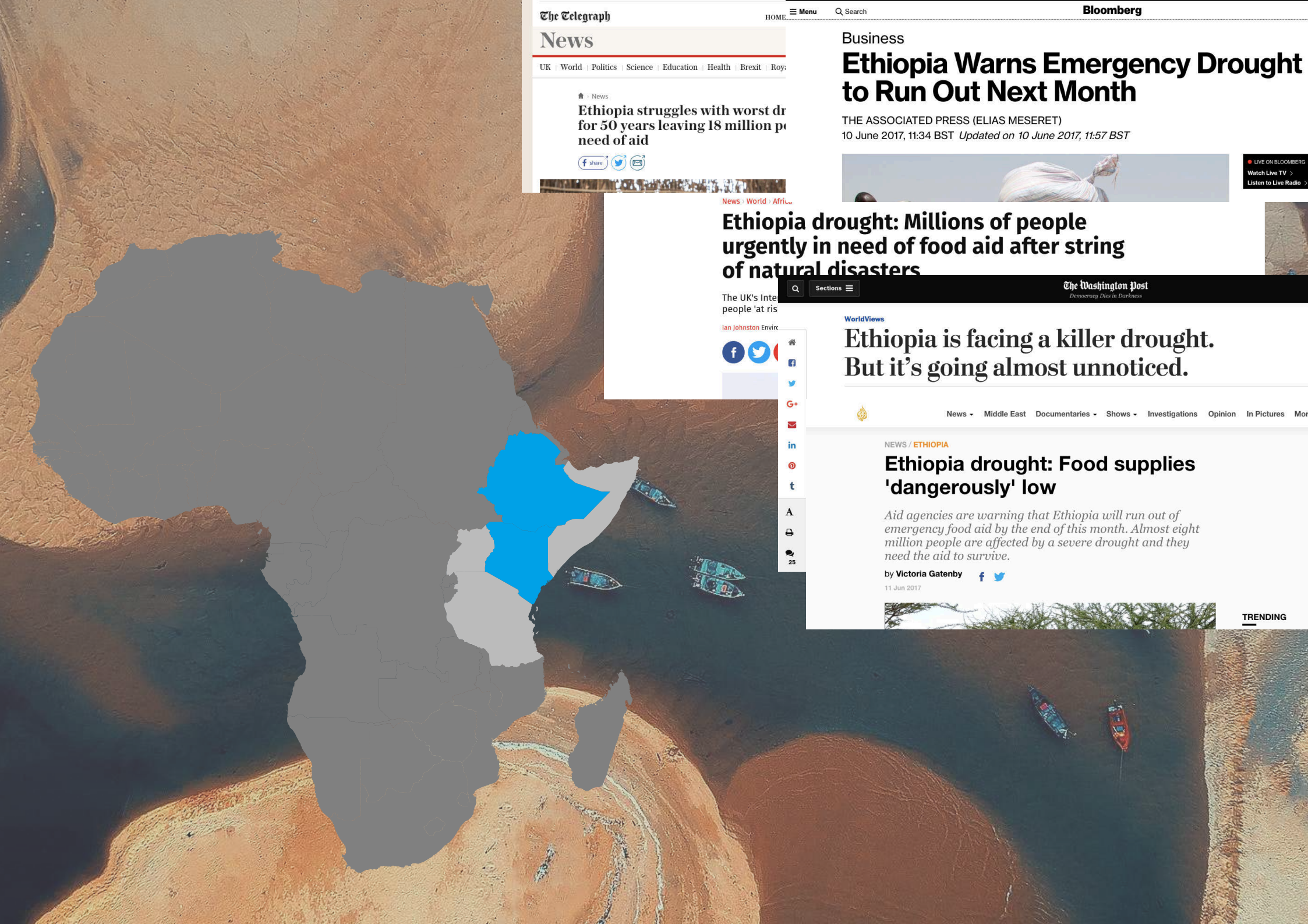

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for 50 years leaving 18 million p
need of aid

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Ethiopia Warns Emergency Drought to Run Out Next Month

THE ASSOCIATED PRESS (ELIAS MESERET)

10 June 2017, 11:34 BST *Updated on 10 June 2017, 11:57 BST*

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NEWS / ETHIOPIA

Ethiopia drought: Food supplies 'dangerously' low

Aid agencies are warning that Ethiopia will run out of emergency food aid by the end of this month. Almost eight million people are affected by a severe drought and they need the aid to survive.

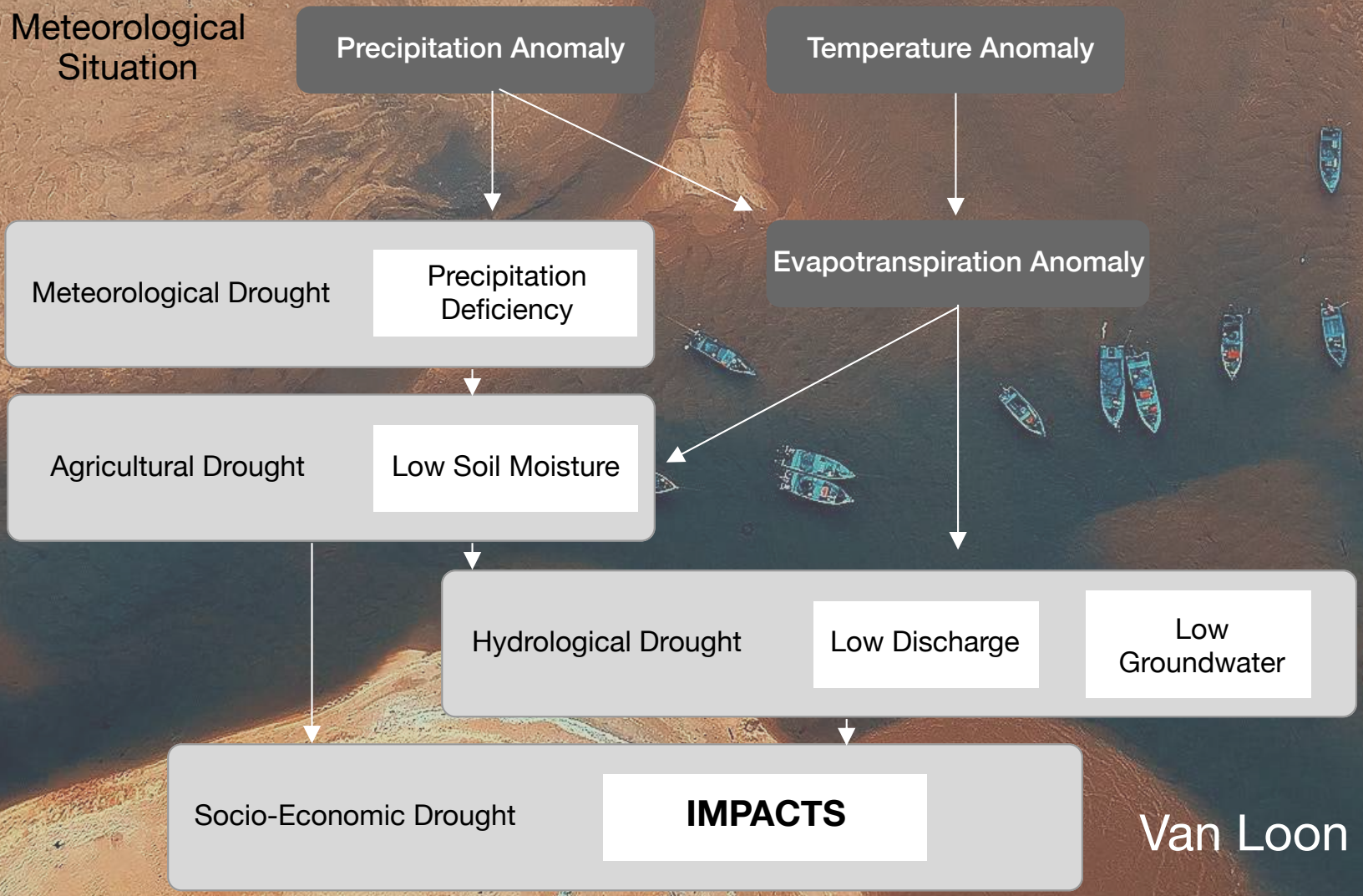
by **Victoria Gatenby**

11 Jun 2017

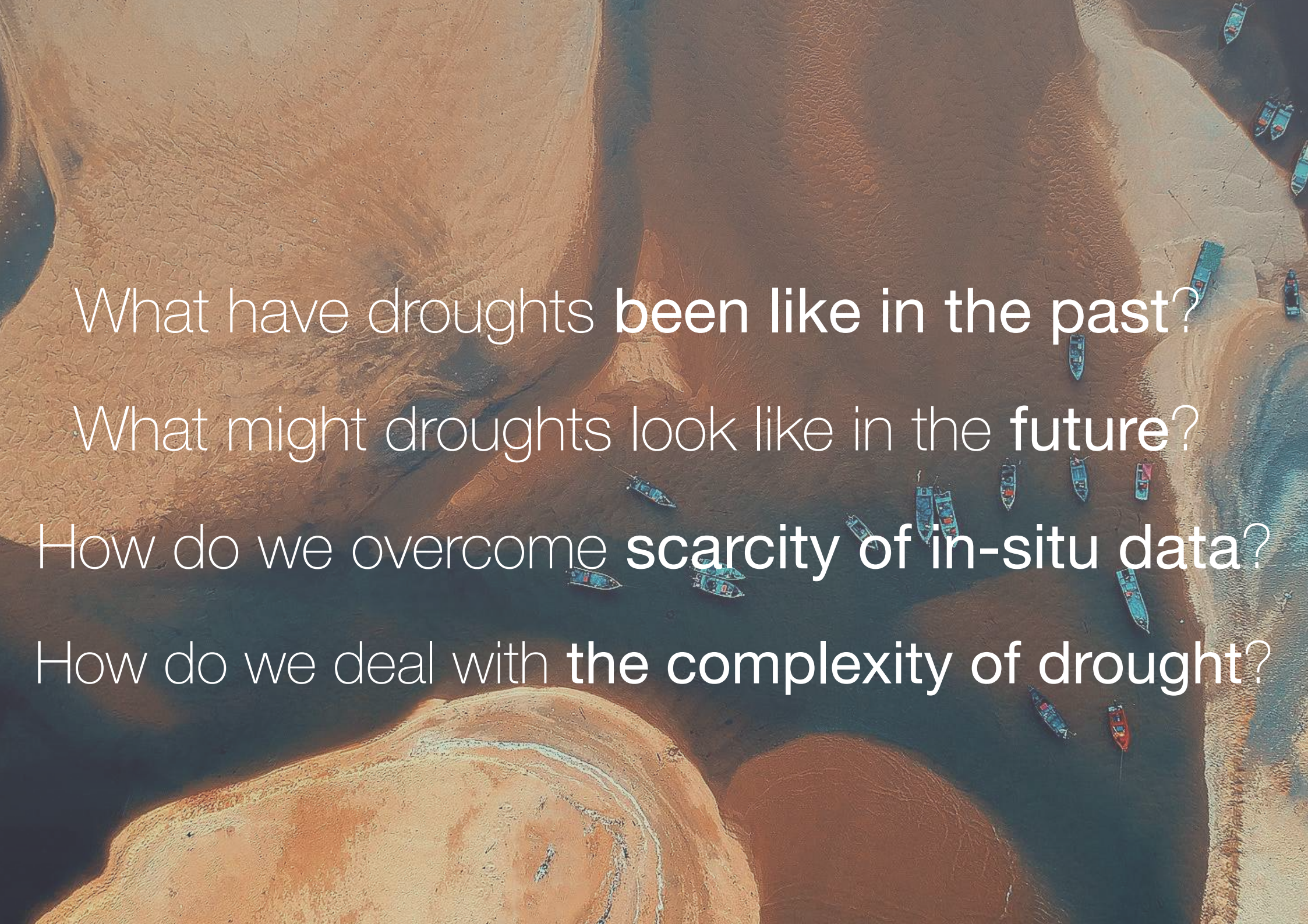
TRENDING

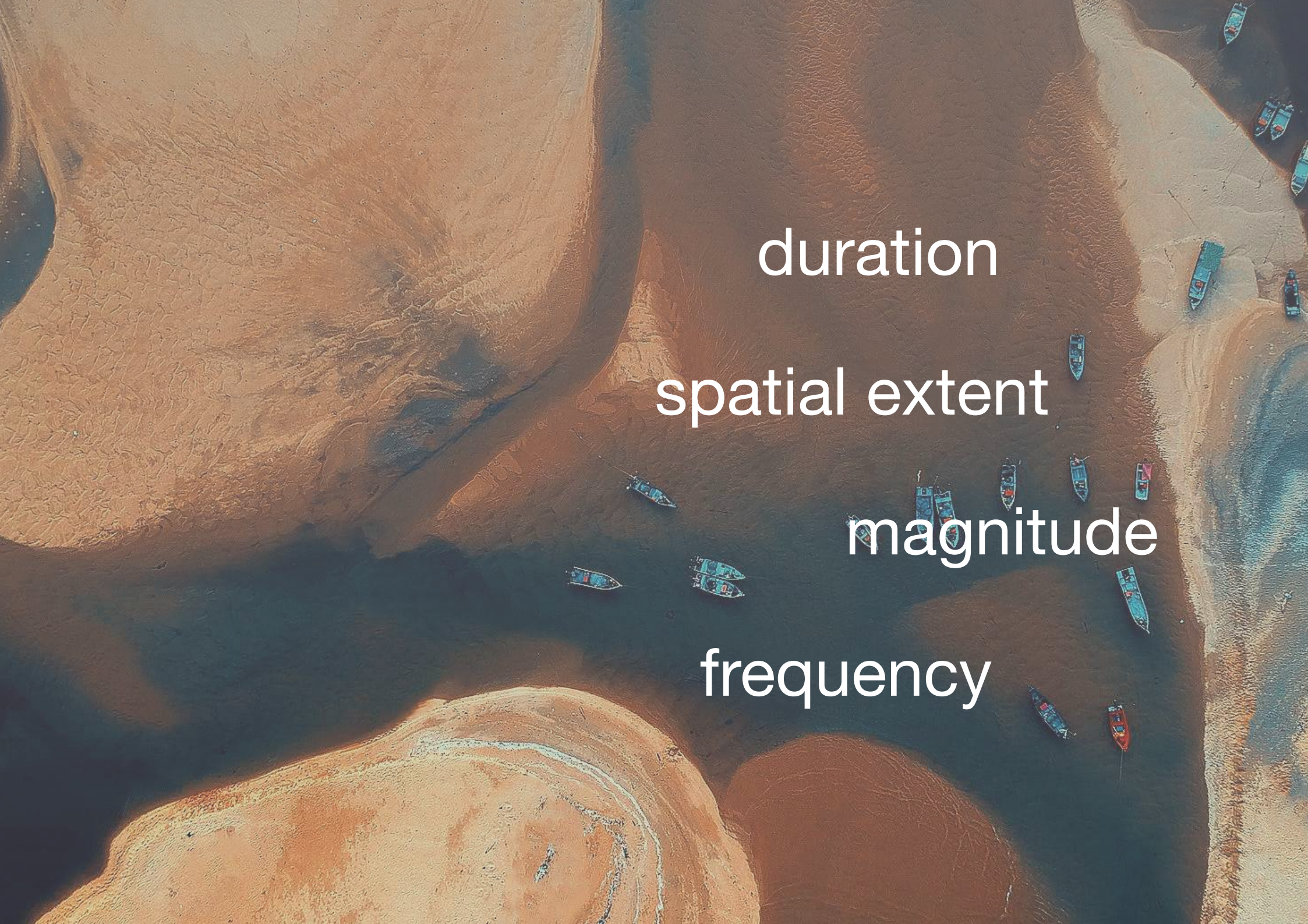
"the creeping disaster"

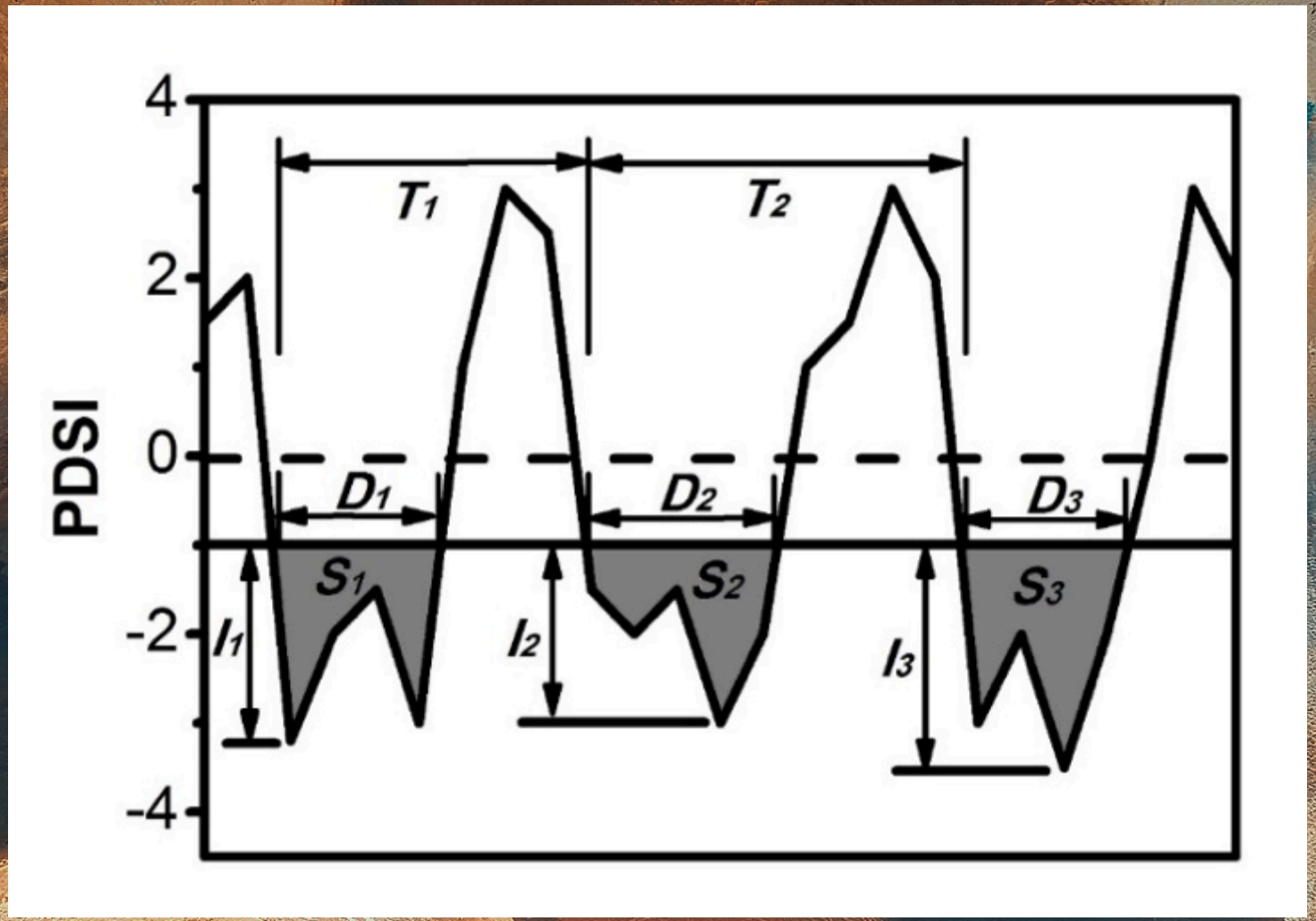
Sheffield and Wood (2011)

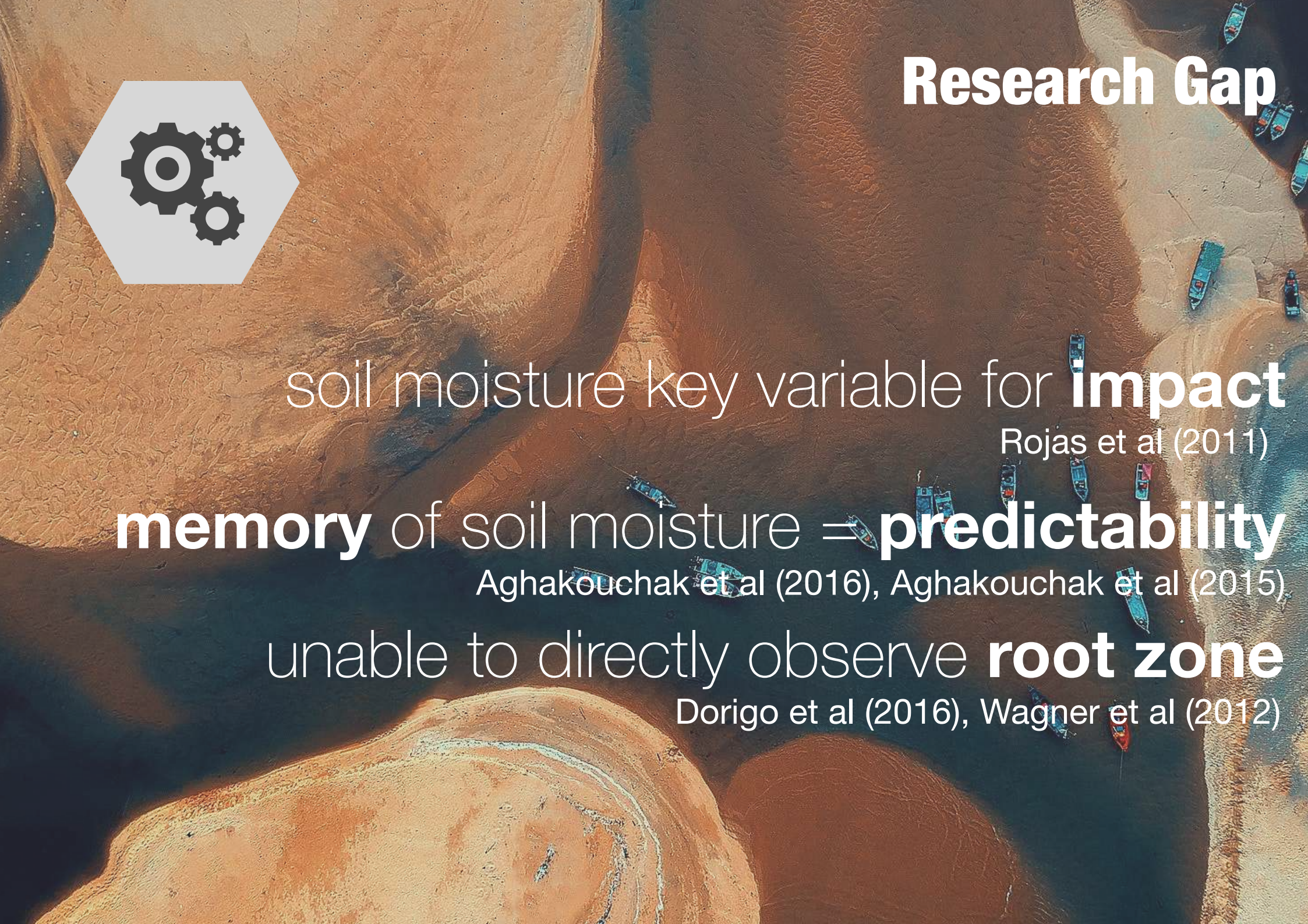


Van Loon (2015)


What have droughts been like in the past?
What might droughts look like in the future?
How do we overcome scarcity of in-situ data?
How do we deal with the complexity of drought?


duration
spatial extent
magnitude
frequency


PDSI
4
2
0
-2
-4
T1
T2
D1
D2
D3
S1
S2
S3
I1
I2
I3



Research Gap

soil moisture key variable for **impact**

Rojas et al (2011)

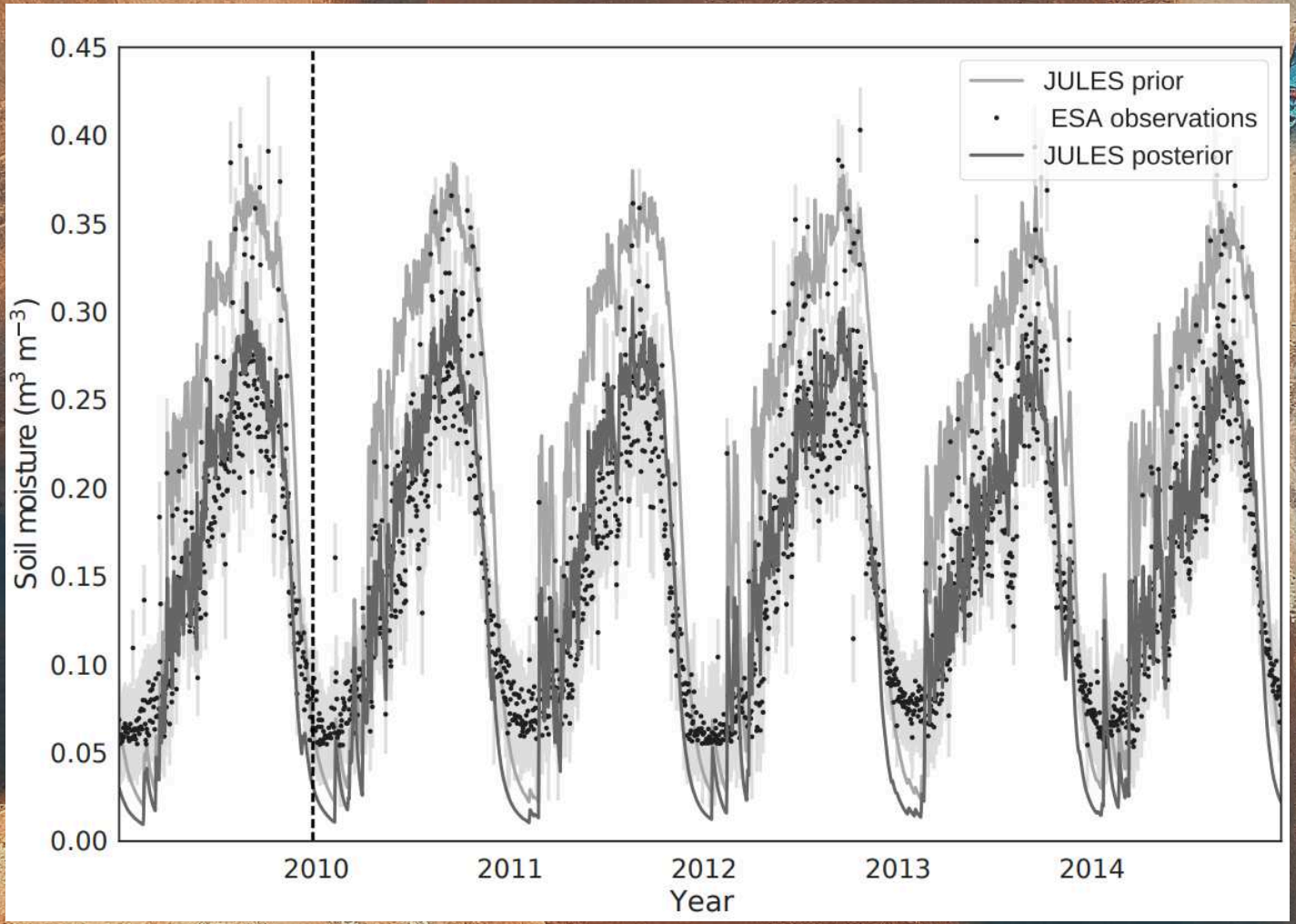
memory of soil moisture = **predictability**

Aghakouchak et al (2016), Aghakouchak et al (2015)

unable to directly observe **root zone**

Dorigo et al (2016), Wagner et al (2012)

Method



Pinnington et al (2018)

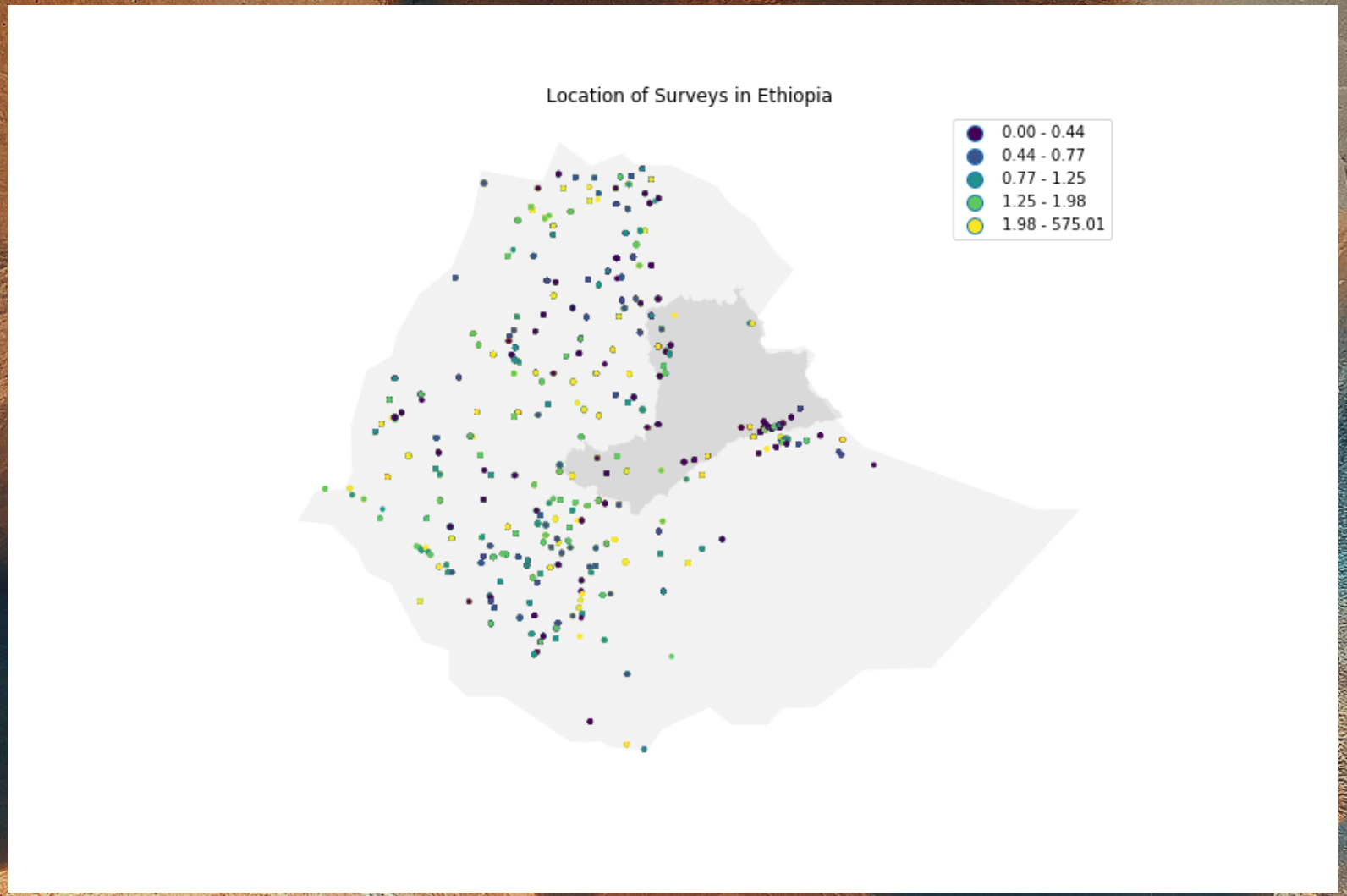
Research Gap

impact often considered at **national scale**

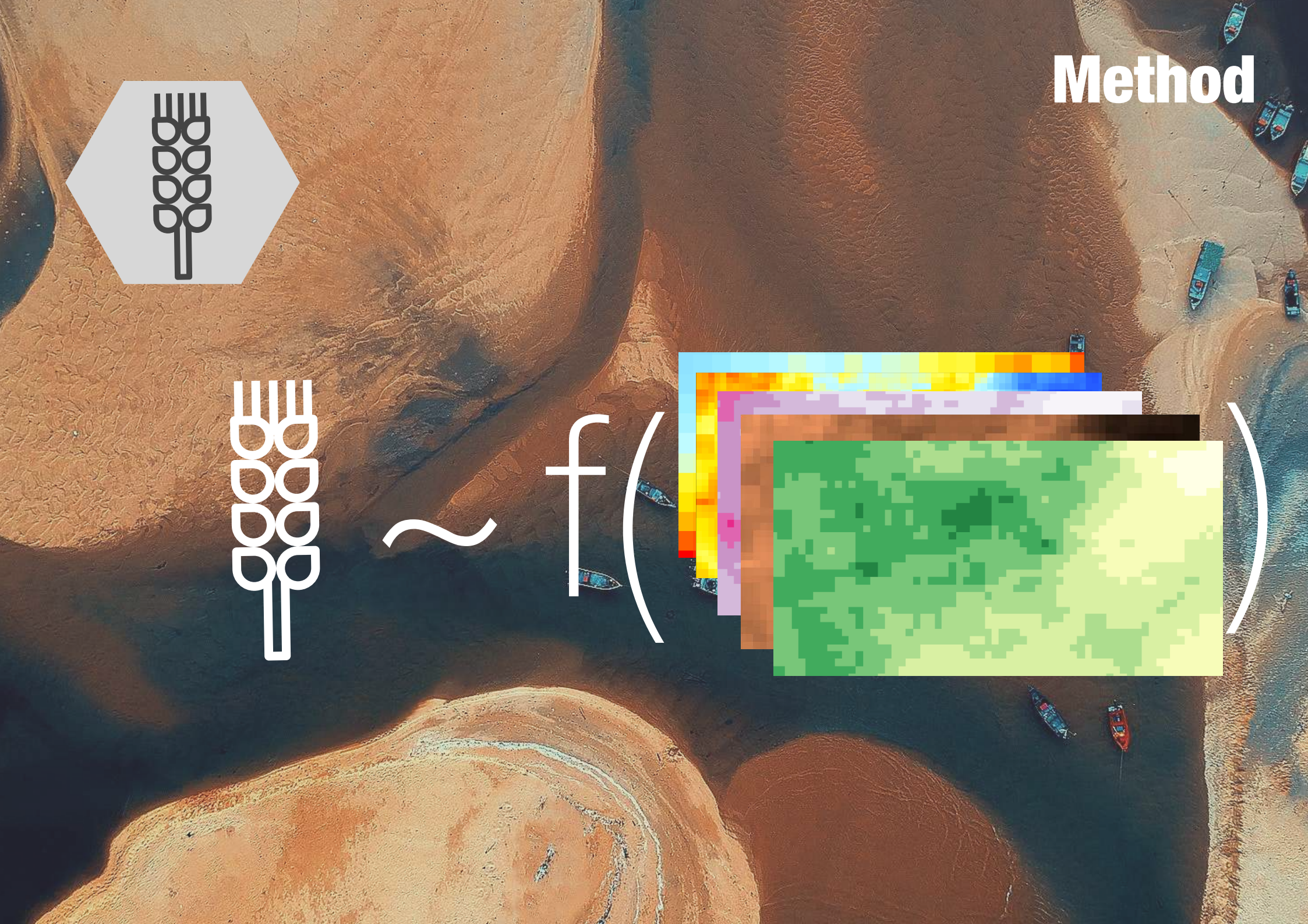
Enenkel et al (2011)

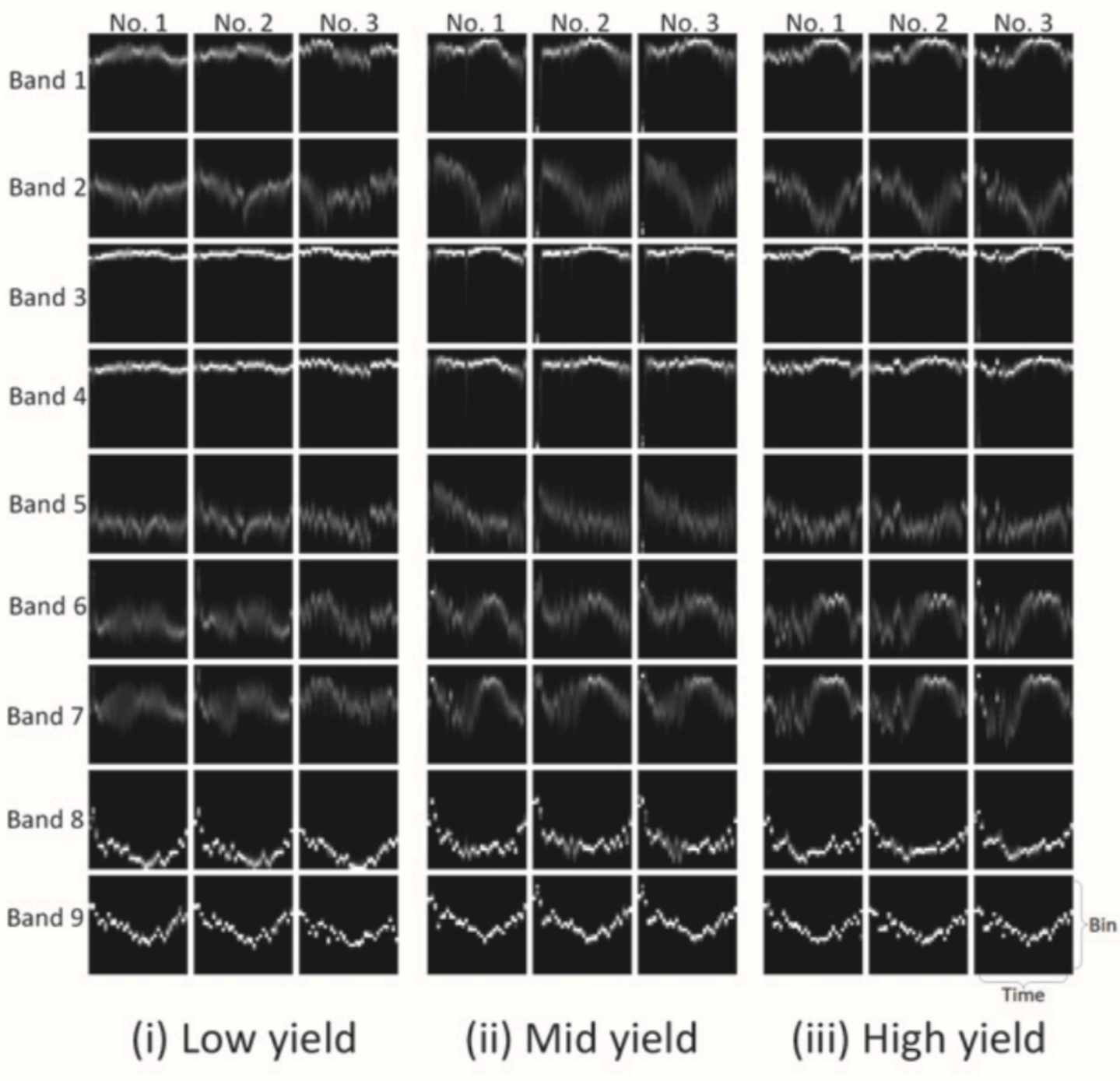
Increased predictive **accuracy using GPs**

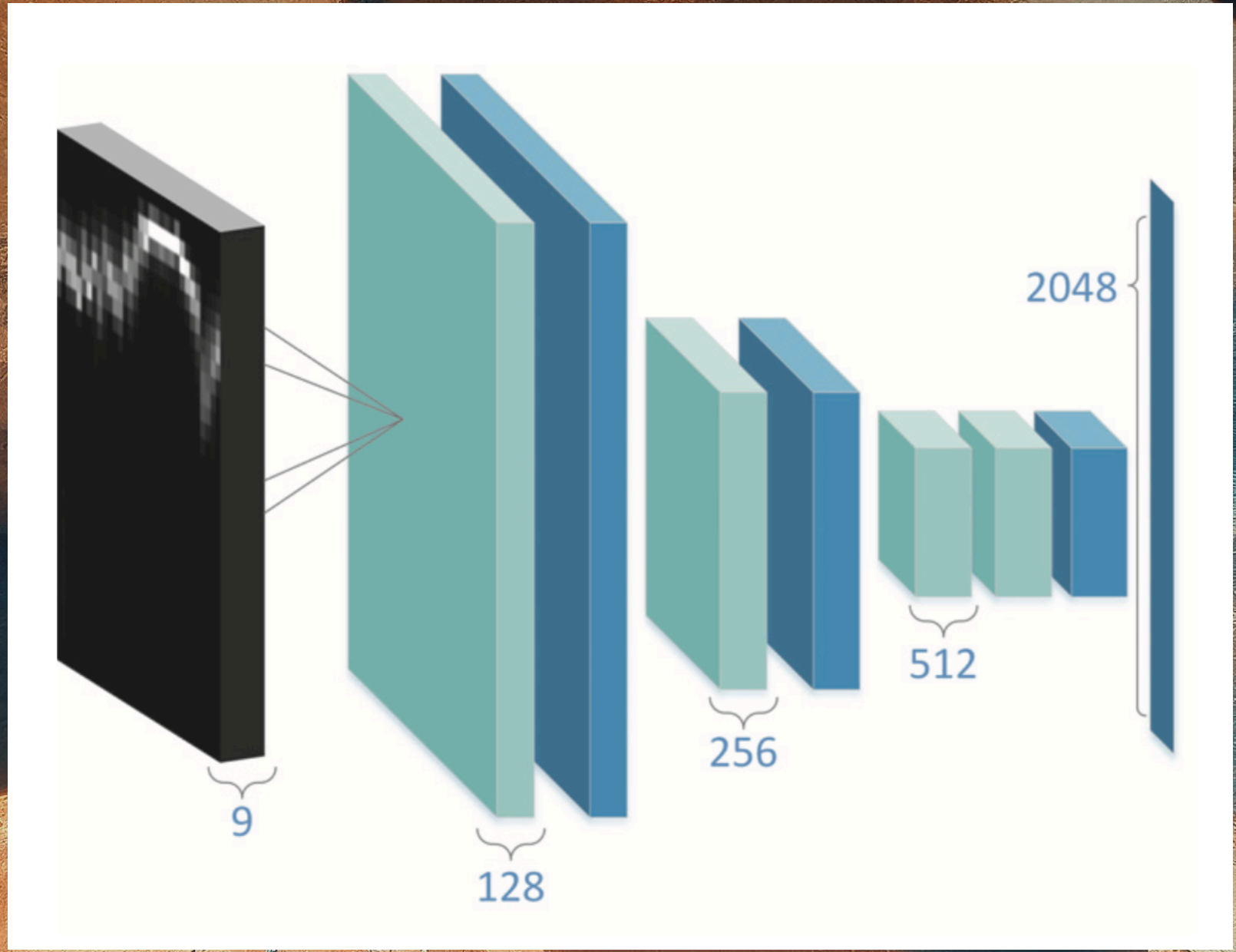
J, You et al (2017)


Location of Surveys in Ethiopia
0.00 - 0.44
0.44 - 0.77
0.77 - 1.25
1.25 - 1.98
1.98 - 575.01

Method




No. 1
No. 2
No. 3
No. 1
No. 2
No. 3
No. 1
No. 2
No. 3
Band 1
Band 2
Band 3
Band 4
Band 5
Band 6
Band 7
Band 8
Band 9
Bin
Time
(i) Low yield
(ii) Mid yield
(iii) High yield


2048
512
256
128
9


THIS IS YOUR MACHINE LEARNING SYSTEM?
YUP! YOU POUR THE DATA INTO THIS BIG PILE OF LINEAR ALGEBRA, THEN COLLECT THE ANSWERS ON THE OTHER SIDE.
WHAT IF THE ANSWERS ARE WRONG?
JUST STIR THE PILE UNTIL THEY START LOOKING RIGHT.
DATA
ANSWERS

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