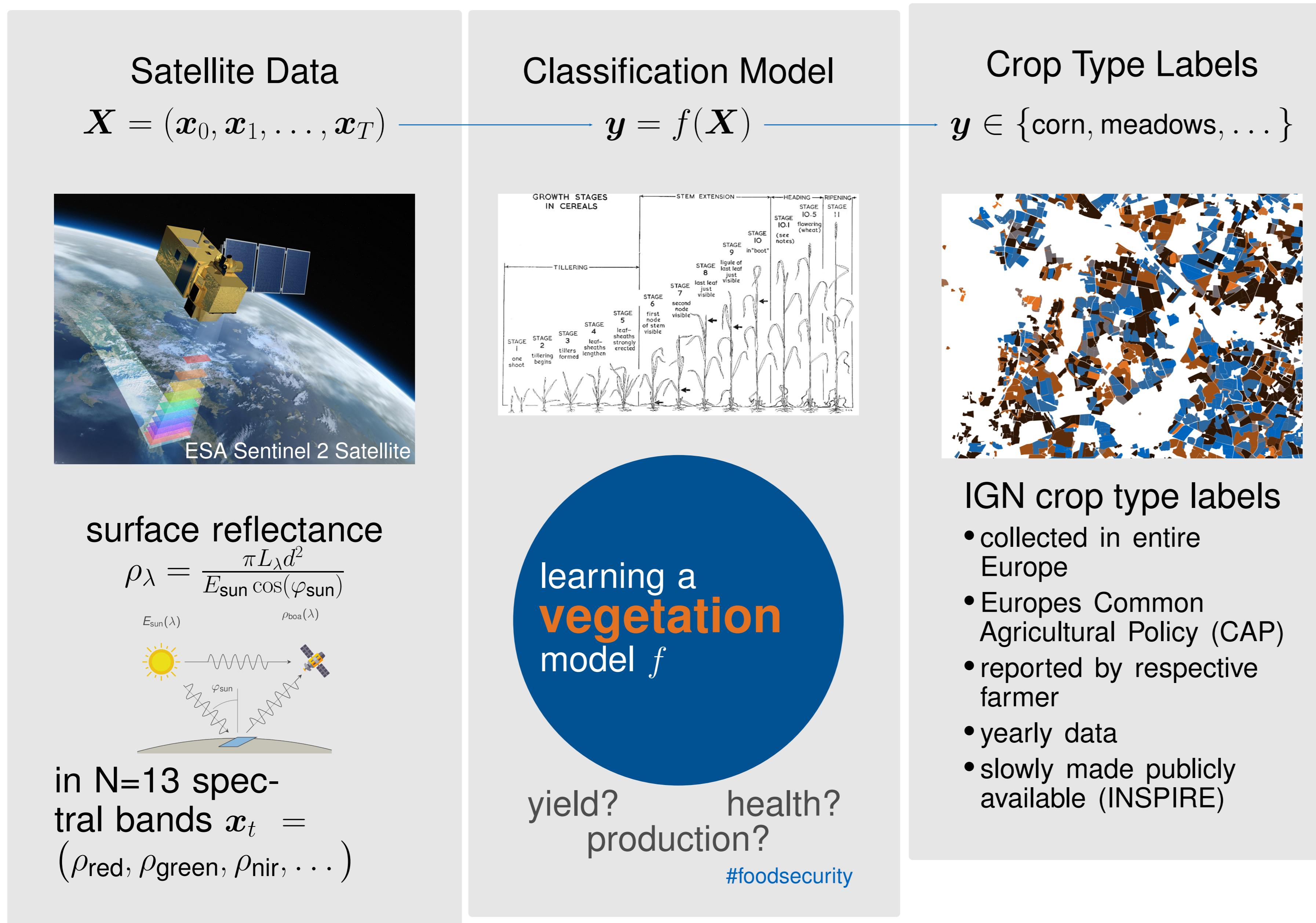


BreizhCrops: A Satellite Time Series Dataset for Crop Type Identification

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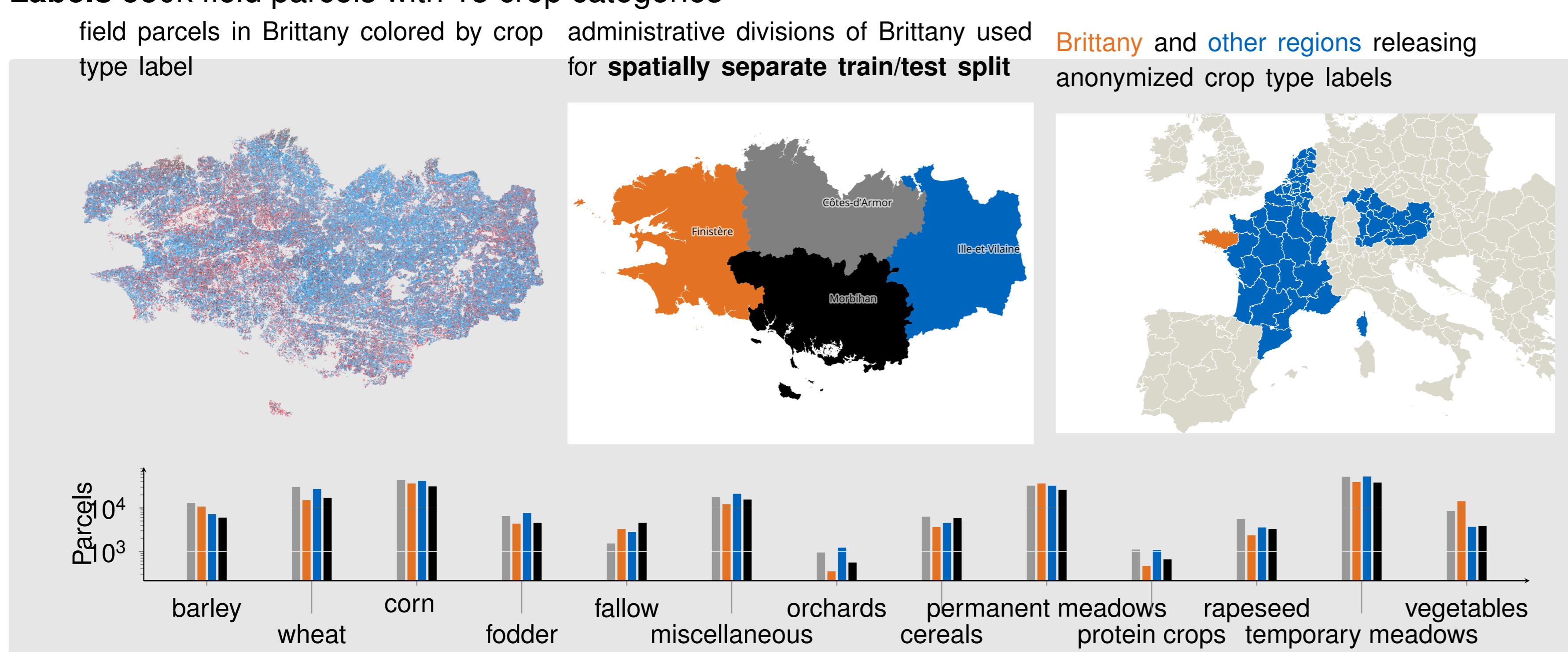
The Objective



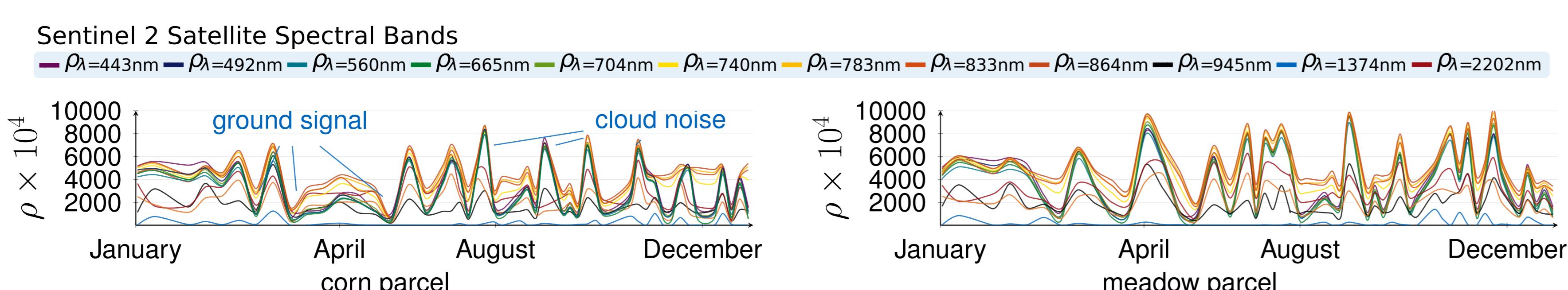
The Data

Brittany, France (*Breizh* in local language)

Labels 580k field parcels with 13 crop categories



Time Series 70-150 surface reflectance measurements in 13 spectral bands for each parcel of the season 2017



The Baseline Results

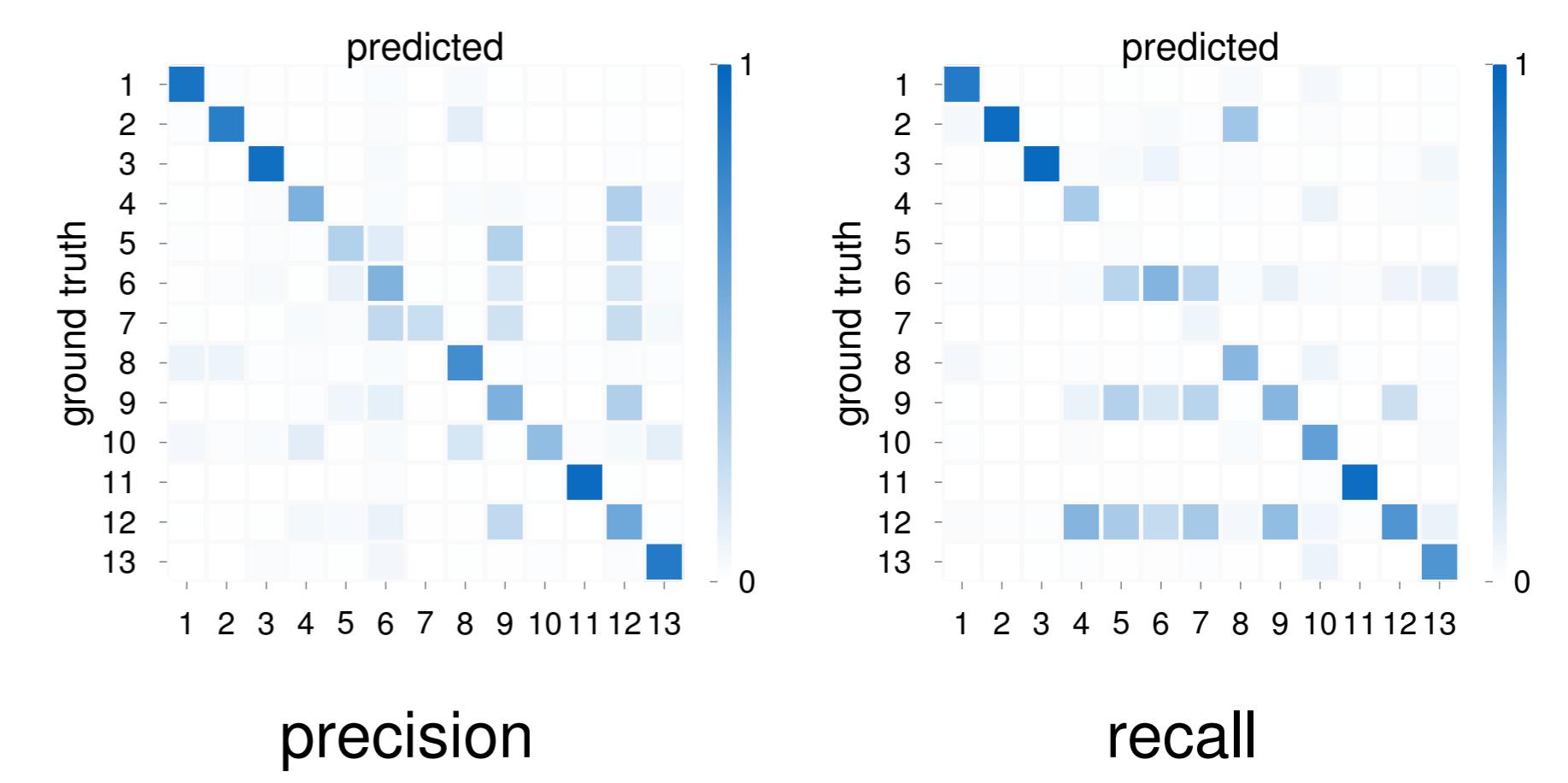
We show the feasibility of classifying this dataset with **LSTM** (Hochreiter & Schmidhuber, 1997) and **Transformer** (Vaswani et al., 2017) baselines.

Comparison of Baseline Models

method	acc	κ	f_1	prec.	rec.
Transformer	0.69	0.63	0.57	0.60	0.56
LSTM	0.68	0.62	0.59	0.63	0.58

Class-wise results of the LSTM model.

# crop type	prec.	rec.	f_1	#samples
1 barley	90	86	88	4982
2 wheat	83	95	89	13850
3 corn	93	96	94	25059
4 fodder	51	34	41	3449
5 fallow	30	2	4	3863
6 misc.	50	49	49	12499
7 orchards	21	7	10	391
8 cereals	74	47	57	4645
9 perm. meadows	51	47	49	20966
10 protein crops	42	61	50	498
11 rapeseed	96	94	95	2664
12 temp. meadows	56	68	62	29977
13 vegetables	86	69	76	3114
	63	58	59	125957



Outlook

pre-train vegetation model on available crop type data
test generalization over changing environmental conditions
gather more crop data with awarded *Google Research Credits*

Feedback

- other baseline models?
- general interest in this application?
- ideas to address the challenges?

References

- Hochreiter, S. and Schmidhuber, J. Long short-term memory. *Neural computation*, 9(8):1735–1780, 1997.
 Vaswani, A., Shazeer, N., Parmar, N., Uszkoreit, J., Jones, L., Gomez, A. N., Kaiser, L., and Polosukhin, I. Attention is all you need. *CoRR*, abs/1706.03762, 2017. URL <http://arxiv.org/abs/1706.03762>.