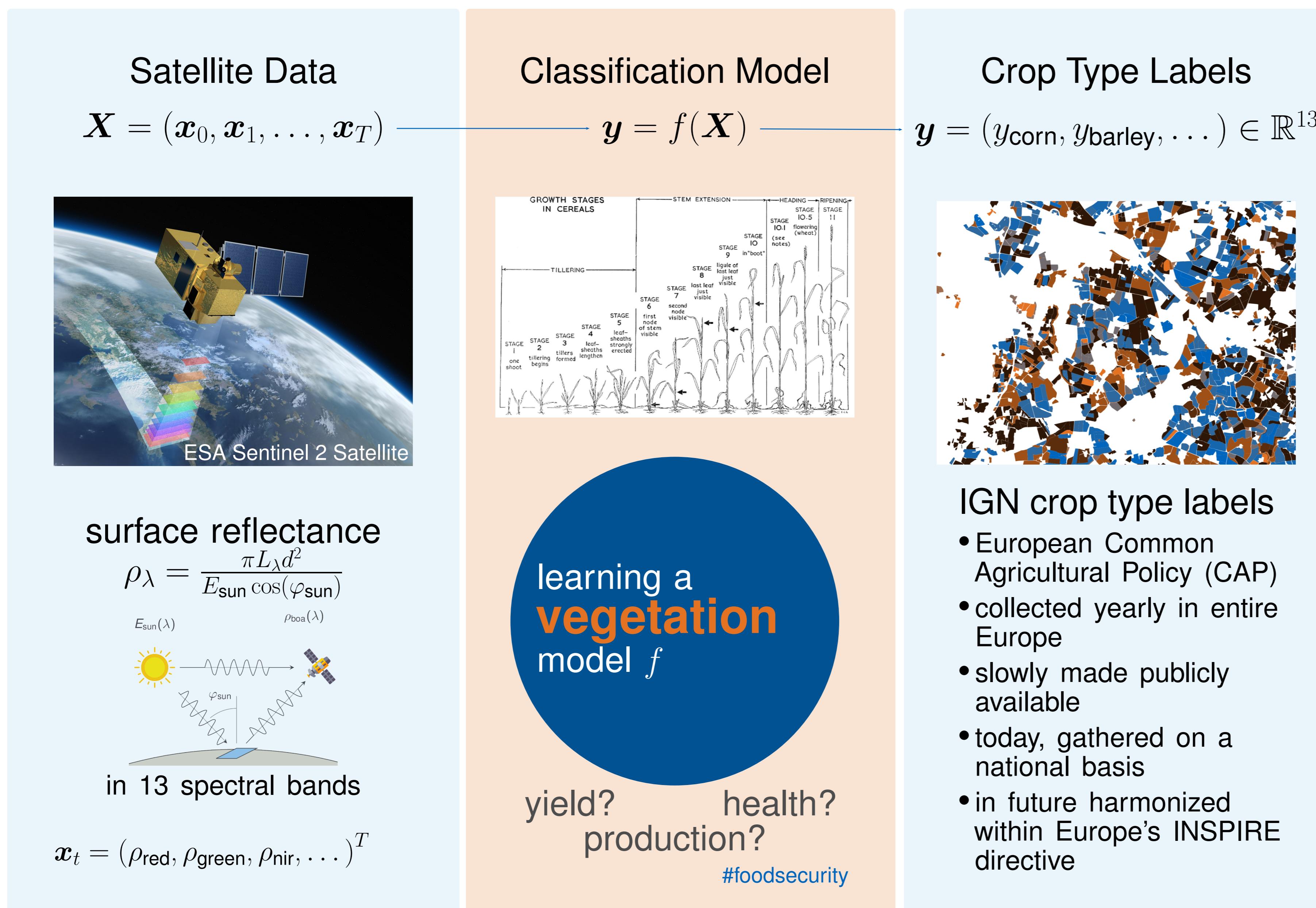


BreizhCrops: A Satellite Time Series Dataset for Crop Type Identification

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Objective

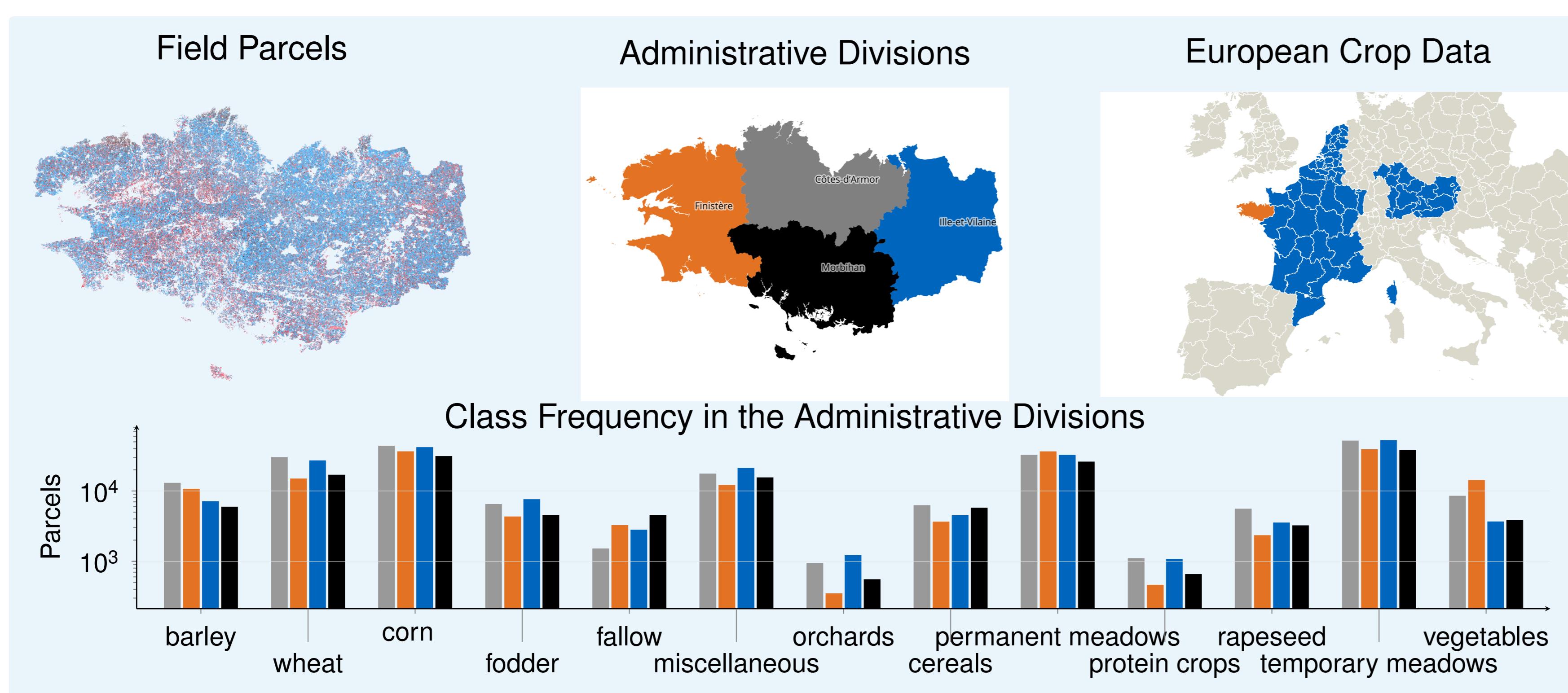


Data

Data gathered in Brittany, France (*Breizh*) in 2017 covering 27.206 km².

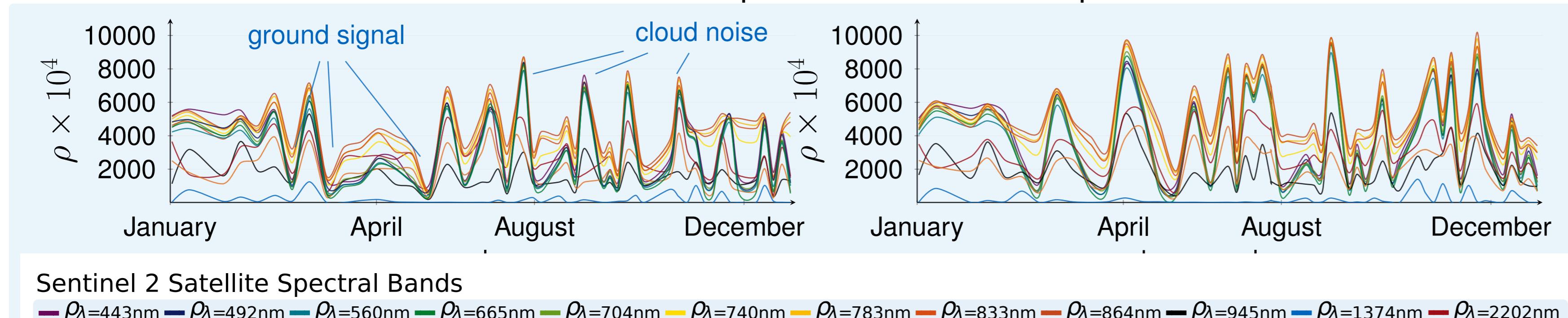
Labels

580k field parcels with 13 crop categories



Satellite Reflectance Time Series

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



Results

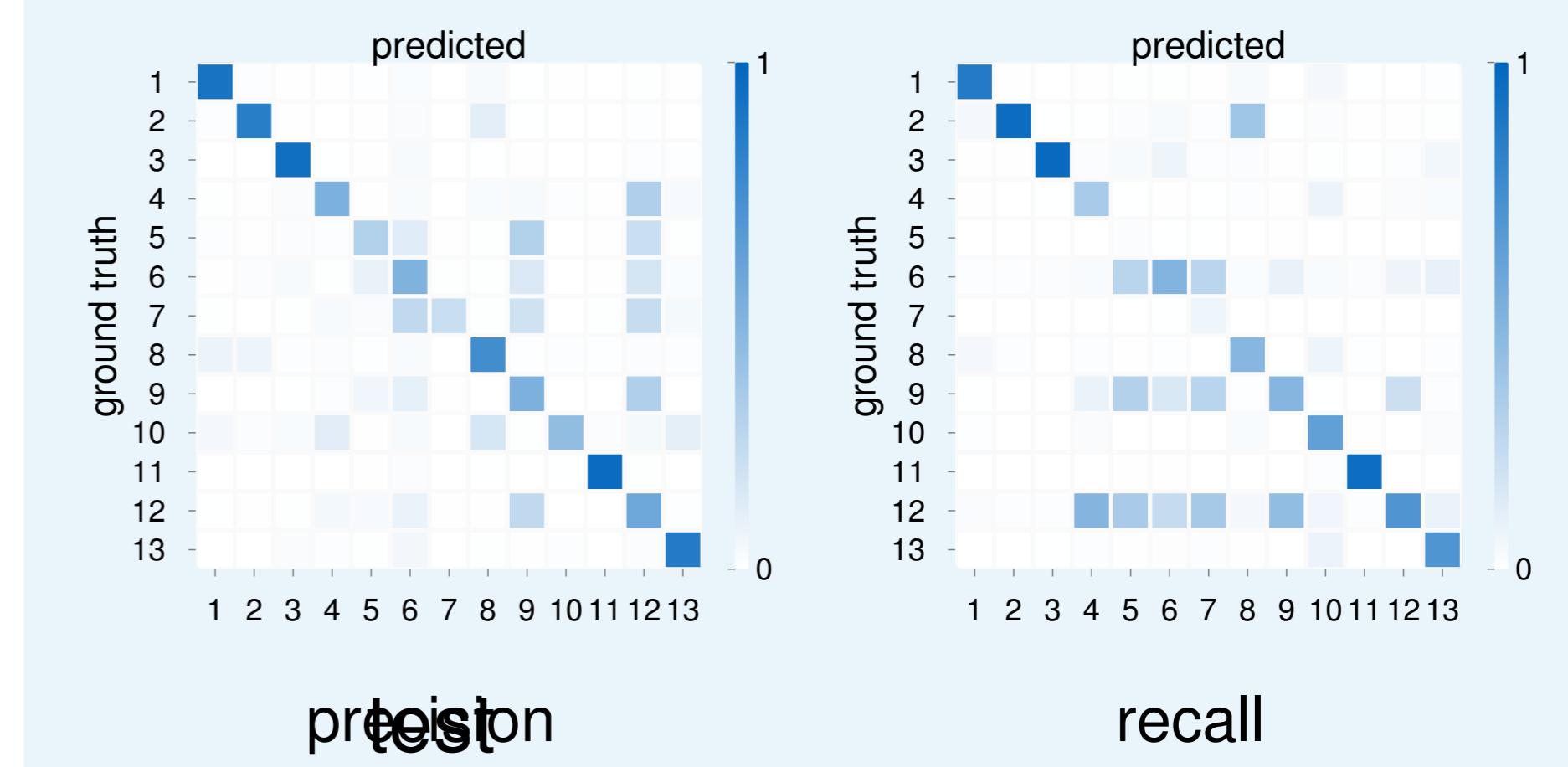
We show the feasibility of classifying this dataset with **LSTM** (Hochreiter & Schmidhuber, 1997) and **Transformer** (Vaswani et al., 2017) baselines.

Comparison of Baseline Models

method	accuracy	κ	f_1	prec.	rec.
Transformer	.69	.63	.57	.60	.56
LSTM	.68	.62	.59	.63	.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**
- *Google Research Credits* for large-scale crop type mapping

Feedback

- suggestion of baseline models?
- 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>.

