**# Scotland-crop-map: Analysis instructions**

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This folder contains datasets and R code for analysing the Scottish crops data.

Download all files (datasets and code) into the same folder before running the code.

**SYSTEM REQUIREMENTS**

- Latest R version from https://www.r-project.org/

- Latest RStudio from https://www.rstudio.com/products/rstudio/download/

- Install Packages listed at the beginning of each R code

**DATASETS**

THERE ARE 3 DATASETS INCLUDED IN SCOTTISH CROPS ANALYSIS:

1 - crop-growing-seasons.csv

Format: CSV

Size: 5 KB (tiny)

Contents: information about crops growing life-cycle.

Use: shows a generic crops growth pattern through the year (Jan to Dec). It will give you an idea of the data pattern you should expect to see in satellite images.

2 - ground\_truth\_v5\_2018\_inspection\_kelso\_250619\_zonal\_stats\_for\_ml.csv

Format: CSV

Size: 303 KB (very small)

Contents: Kelso LABELLED (ie. fields with crop types) data including VV and VH means and variances for Jan to Oct 2018.

Use: use to build Random Forest model.

Output: PDF (plots), TXT (command line results).

3 - kelso\_to\_be\_classified.csv

Format: CSV

Size: 46.9 MB (big-ish)

Contents: Kelso UN-LABELLED (ie. fields without crop types) data including VV and VH means and variances for Jan to Oct 2018.

Use: run it through the Random Forest model to assign crop type to each field.

Output: PDF (plots), TXT (command line results), CSV (3 files; one with crops classes from each model).

4 - images in Train and Test folders (see James Crone at EDINA for folders location)

Format: TIF

Size: 150 MB x 4 folders (huge!)

Contents: images of individual fields, split between Train and Test sets, and by crop-type withing each set.

Use: use to build Neural Network model.

Output: PDF (plots), TXT (command line results).

**CODE**

THERE ARE 5 PROGRAMS INCLUDED IN SCOTTISH CROPS ANALYSIS:

1 - Kelso.Rproj

Always open this file first. It recognizes saved R/RStudio environment, and directory you are running the code from. You should NOT have to make any dirctory changes when running code from this R project.

2 - Crop-Growing-Seasons.R

Uses crop-growing-seasons.csv data to look at general crops life-cycle info.

3 - Kelso\_Exploratory\_Analysis.R

Uses kelso-monthlyzonal-2018-fixed.csv data to look at Kelso area fields details.

4 - Kelso\_Random\_Forest.R

Uses ground\_truth\_v5\_2018\_inspection\_kelso\_250619\_zonal\_stats\_for\_ml.csv data to build and select the best Random Forest classification model.

Uses kelso\_to\_be\_classified.csv to generate crop types for these un-labelled fields).

5 - Kelso\_NeuralNet.R

Uses TIF images stored in Train and Test folders to build a Neural Net classification model (ask James C.) where they are on the VM.