CESM-CLM4.0 Input File Modification for CA Project

This is currently set up to duplicate all the c3_crop (PFT=15) parameters into the c3_irrigated (PFT=16)

Here we update the surfdata, surfdata.pftdyn and pft-physiology files that are read into CLM. Note that the CLM namelist file needs to be updated to define the path and names of the modified files.

Code: /net/so4/landclim/hirscha/conserveAG/inputMODS

module load ncl/6.3.0

Use the **SPLIT_CROP_PFT.ncl** script which will modify the CLM input files to include the CA extents. For the mapping this is done as:

PFT15_NEW = PFT15_IN x (1 - CA_AREA / CROP_AREA)
PFT16_NEW = PFT15_IN x CA_AREA / CROP_AREA

Note that in this way we avoid grid mismatches which do occur if one applies the CA extents as the fraction of the grid cell that is CA. This is because in CLM the PFT distribution uses the Ramankutty et al. cropland map which is based on the year 2000 extents. However, most of the CA data used to create Reinhard's dataset use values from 2011. The HYDE landcover dataset is used during the rasterisation process which does have some grid inconsistencies with the Ramankutty crop cover.

Notes about R. Prestele's dataset

- Resolution is 5 arc minutes so I have aggregated the data to the CLM 1° resolution
- For some reason NCL could only read the Garea, CA_ha and CA_frac variables in the netcdf files as NaNs so instead using the ascii files for these variables - just remember to remove the header in these files.

To plot the managed and unmanaged crop PFTs use **PLOT_LANDCOVER.ncl** figures are saved in/net/so4/landclim/hirscha/conserveAG/figures/

Basic info on the estimates:

- Percentage of cropland that is CA:
  - BASE 9.1%
  - LOW 7%
  - HIGH 12.7%
  - POTENTIAL 72.4%