Three land cover types: Forest (F), Grass (G), and Crop (C).

0.5 x 0.5 degree box

100x100 0.05deg
MODIS pixels.
3-d array:
100x100x3 (F,G,C)
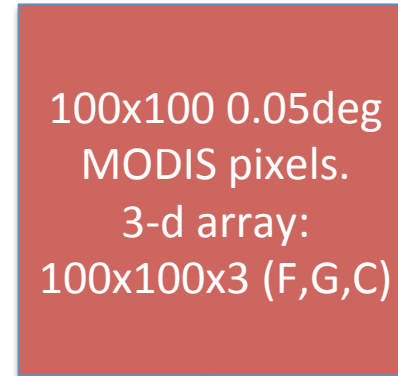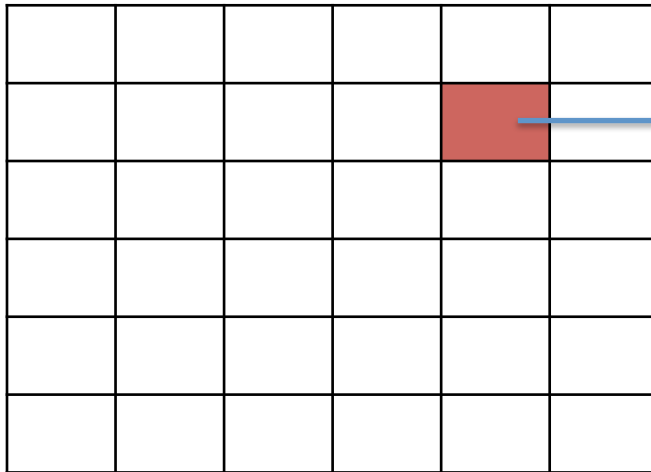
For each 0.5x0.5deg box, first determine if there are pixels that have non-zero fractions for two or three LC types of {F, G, C} from the 10000 pixels.

If no, go to next 0.5x0.5 deg box

If yes, see next figure

Label each non-zero F, G, and C pixels:
F1, F2, … Fn (n pixels that have non-zero forest fraction)
G1,G2, … Gn (n pixels that have non-zero grass fraction)
C1,C2,…Cn (n pixels that have non-zero crop fraction)
- Combine them into unique pairs to be one sample

F1-G1, F1-G2, …

One example for FtoG:
Between two pixels that have
Non-zero forest (pixel 1) and non-zero grass
(number is area percentage)

We can extract:
Decrease in forest fraction($\Delta F$): 80->10 (-70)

| Pixel 1 | Pixel 2 |
|---------|---------|
| F:80    | F:10    |
| G:20    | G:50    |
| C:0     | C:0     |

Increase in grass fraction: 20->50 (+30)
LST difference ($\Delta LST$):
Elevation difference ($\Delta ELV$):
N pairs give N samples

$\Delta LST = b1*FracF + b2*FracC + b3*\Delta ELV$
Slope b1 and b2 show impact of decreasing forest and increasing grass on LST