the grid from a CMIP5 model (original resolution)

the land grid cell of interest i

the big box centred over i

a snow-free grid cell ($snc < 0.1$)

a non-land grid cell (with land cover fraction < 50%, excluded from the analysis)

a snow-covered grid cell ($snc > 0.9$)

From all land grid cells within the big box:

AND

lcf_{tr}, lcf_{sh}, lcf_{cg}, snc, α

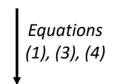*at monthly resolution for 2000-2004*

$lcc_{tr->cg}$

between pre-industrial and 1981-2000

(and $long$, lat, $elev$)

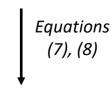if at least 15 grid cells in the big box including i are snow-free ($snc < 0.1$) and $lcf_{tr} + lcf_{sh} + lcf_{cg} > 90\%$

if at least 15 grid cells in the big box including i are snow-covered ($snc > 0.9$) and $lcf_{tr} + lcf_{sh} + lcf_{cg} > 90\%$

if at least 15 land grid cells:

OR

Equations (1), (3), (4)

Equations (2), (5), (6)

Equations (7), (8)

Reconstructed albedo of trees and crops/grasses in i under snow-free conditions

$$\alpha_{tr}^{sf}(i), \alpha_{cg}^{sf}(i)$$

Reconstructed albedo of trees and crops/grasses in i under snow-covered conditions

$$\alpha_{tr}^{sc}(i), \alpha_{cg}^{sc}(i)$$

Reconstructed historical albedo change associated with conversions between trees and crops/grasses in i