

## In mksurfdat.F90 ... generating the landuse.timeseries data....

### 1. Ensure the sum of all land units other than natveg and crop <100%

Suma= Lake[1]+wet[1]+gla[1]+urb[y]

If suma>100, urb[y] \*100/suma, but do not adjust Lake[1], wet[1], gla[1]

We use the adjusted urb[y] in the landuse.timeseries data

### 2. Adjust natveg and crop, but do not ensure the sum of all land units = 100%

Call normalizencheck\_landuse (), using Lake[1], wet[1], gla[1], urb[1], natveg[y] , crop[y]

- Replace bare soil first
- Then replace the natveg and the crop proportionally

**Summary:** in landuse.timeseries data (LTD), the crop[y] should be the same with those in the LTD without transient urban, and the Lake[1]+wet[1]+gla[1]+ urb[y] + crop[y] + natveg[y] might > 100 because of urban growth

The natveg[y] will be adjusted in the dynLandunitAreaMod.F90 as the residual of all other land units.

## In dynLandunitAreaMod.F90

Landunit\_sum= lake[1] + wet[1] + gla[1] + urb [y] + crop[y] + natveg [y]

If Landunit\_sum <100, increase natveg [y]

If Landunit\_sum >100, decrease the land units in the order of istsoil, istcrop, isturb\_md, isturb\_hd, isturb\_tbd, istwet, istdlak

When the urban expands and the Landunit\_sum >100, first reduce the istsoil, and then the istcrop. If the total area of natveg and crop is smaller than urban growth, we have to decrease the urban itself.