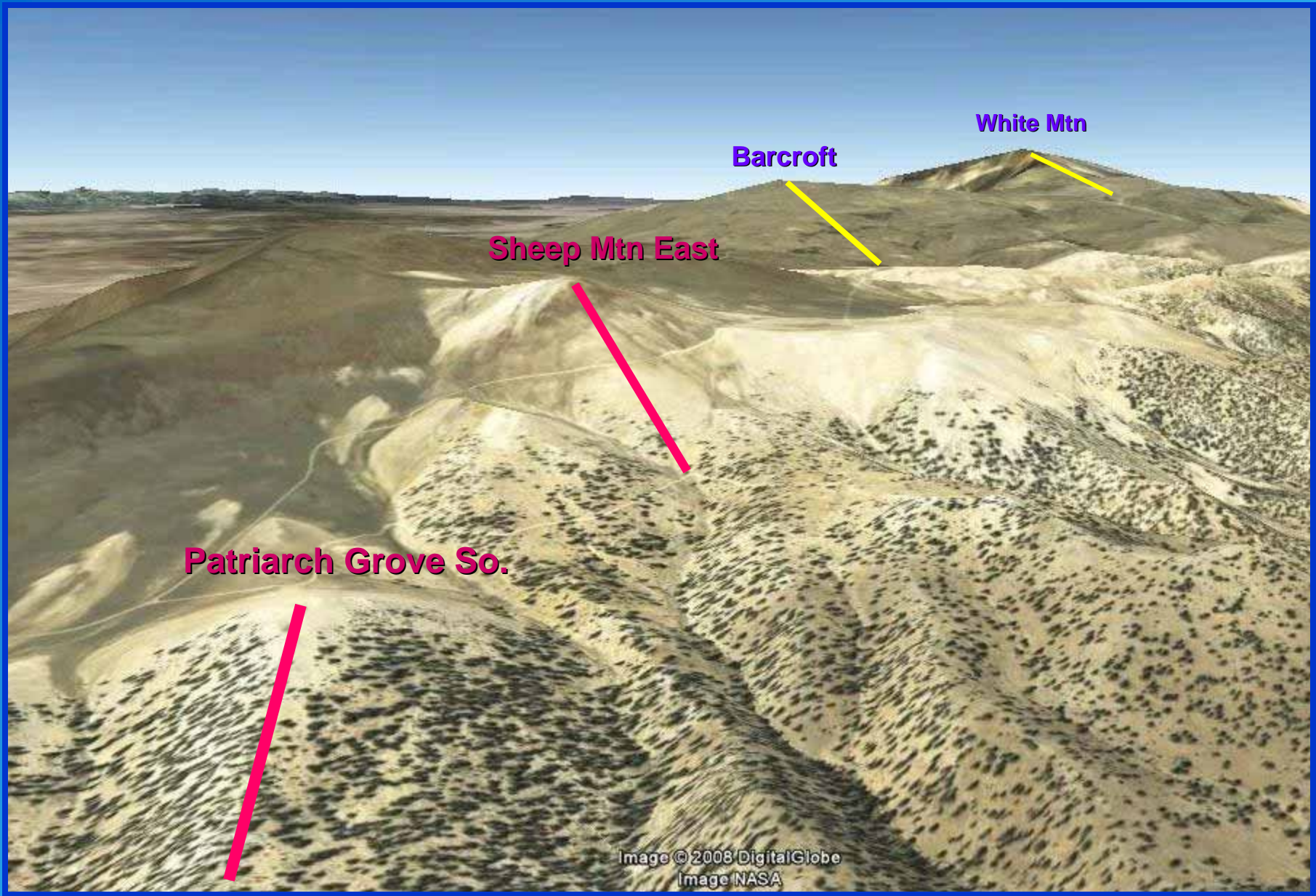


Elevational Patterns of Alpine/Subalpine Plant Distribution in the White Mountains

Jim Bishop & Ann Dennis

California/Nevada GLORIA Project

Field work by Catie Bishop & quite a few others



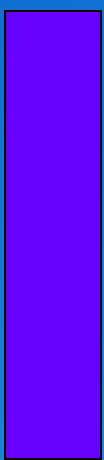
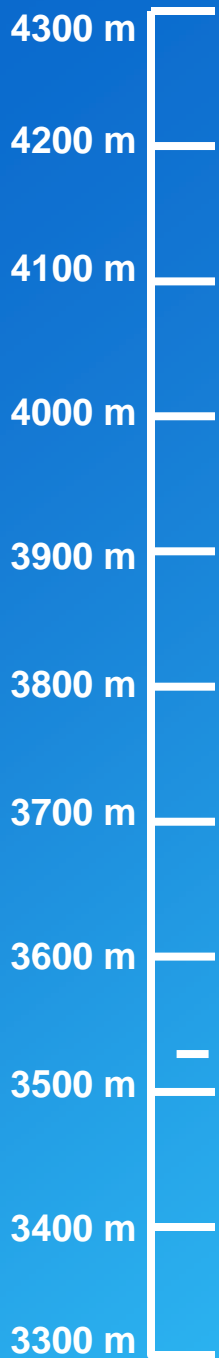
Patriarch Grove So.

Sheep Mtn East

Barcroft

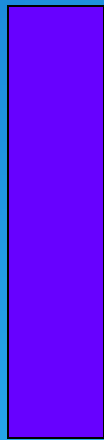
White Mtn

Image © 2008 DigitalGlobe
Image NASA

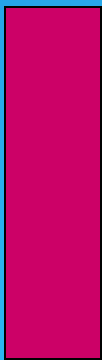


White Mountain

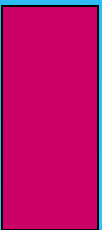
Silicate rock



Barcroft



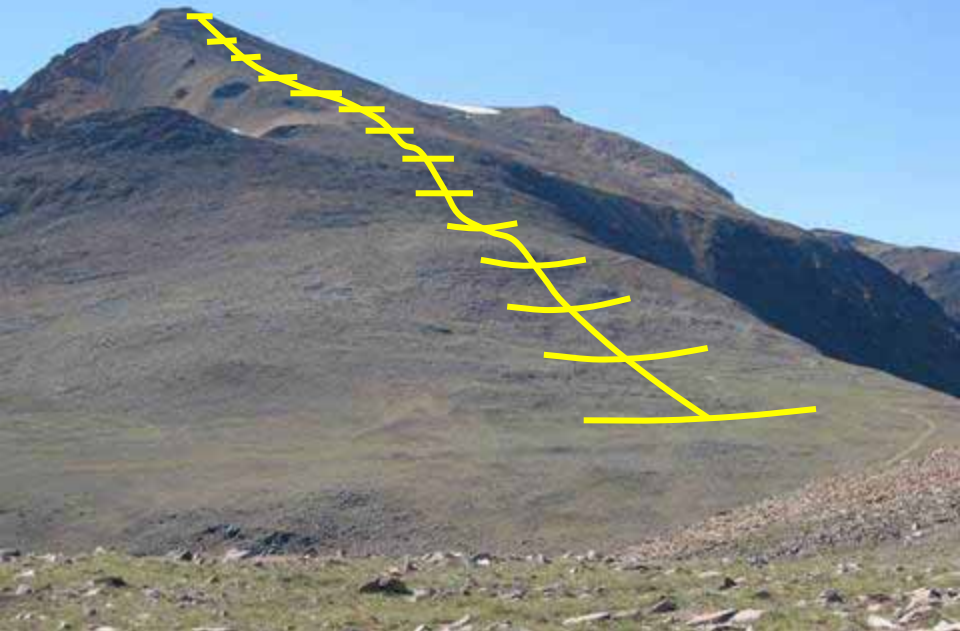
Sheep Mtn. E.



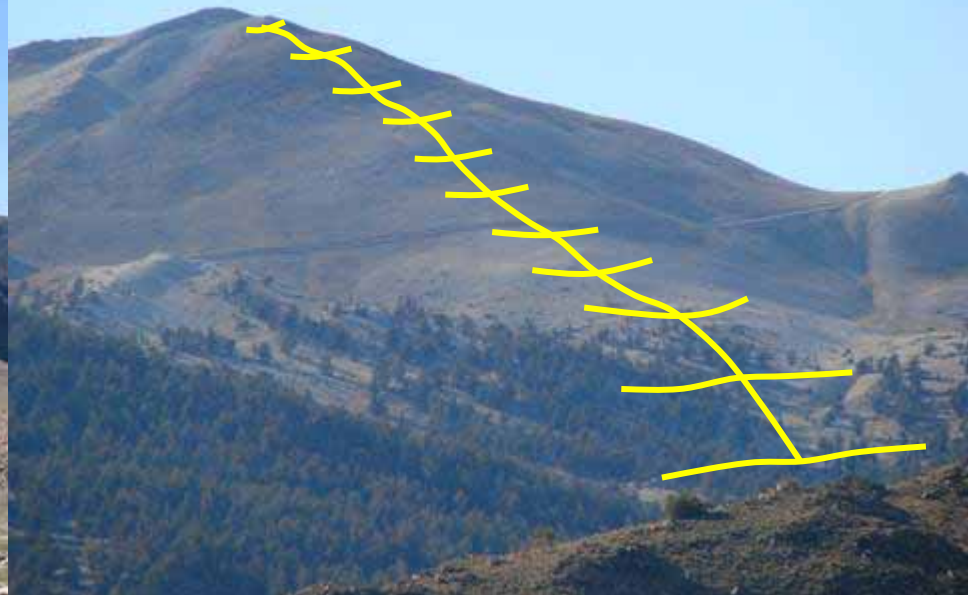
Patriarch Grove S.

Carbonate rock

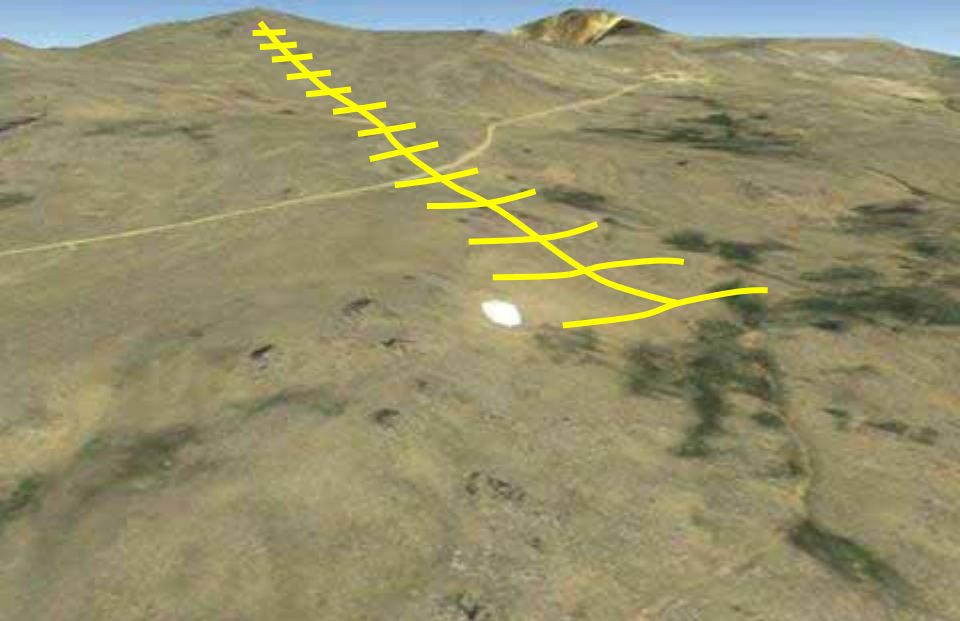
White Mtn



Sheep Mtn East

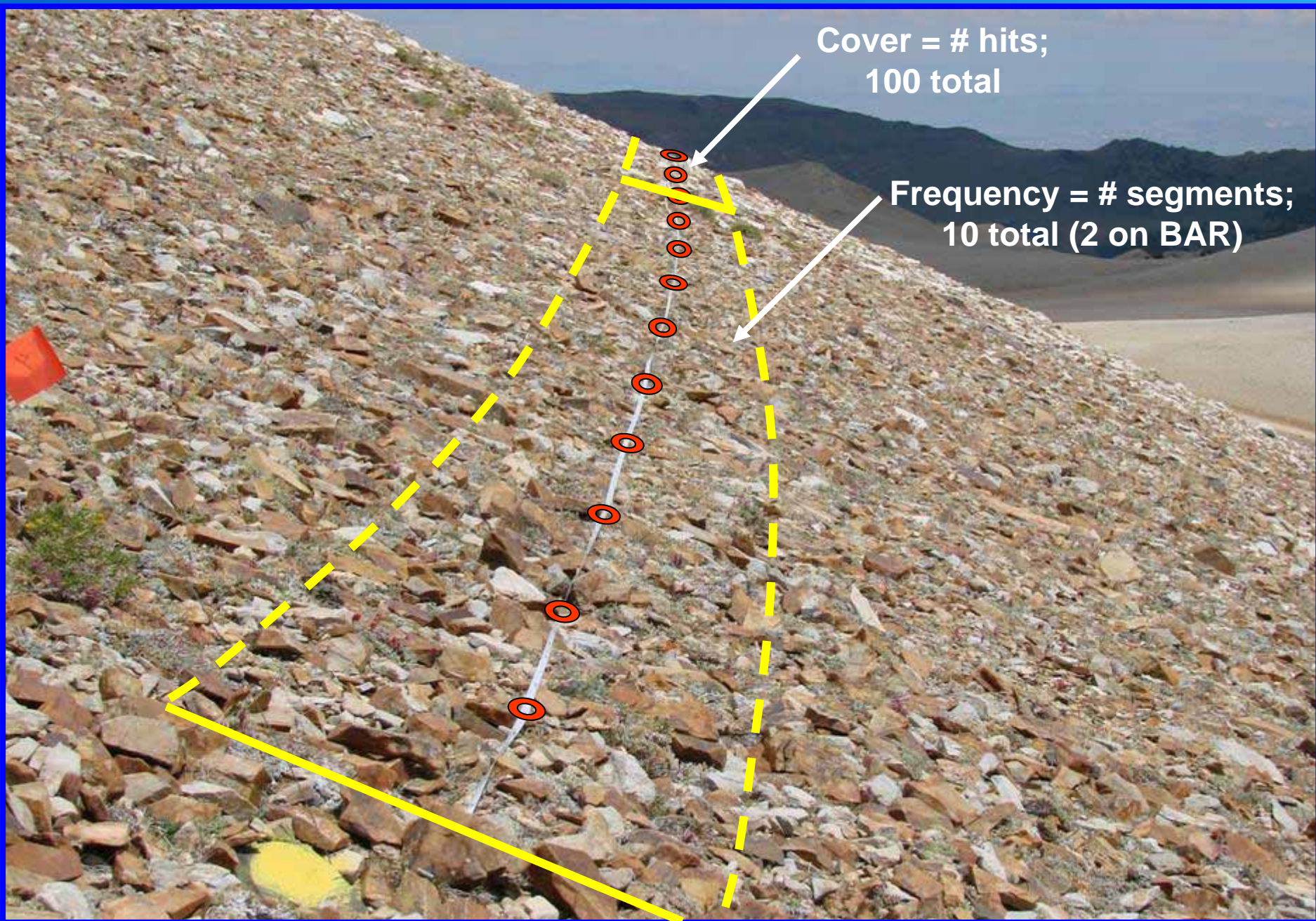


Barcroft



Patriarch Grove S.



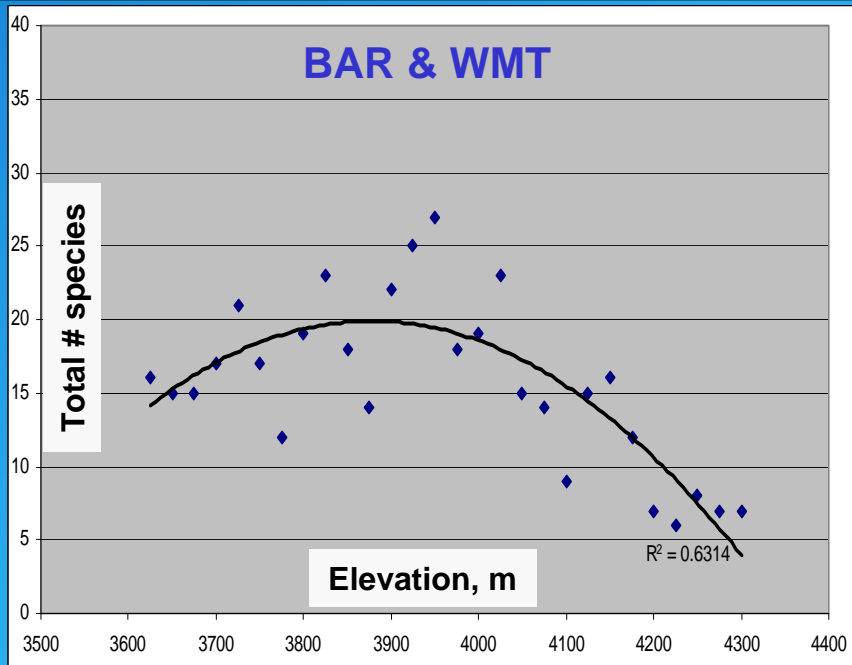
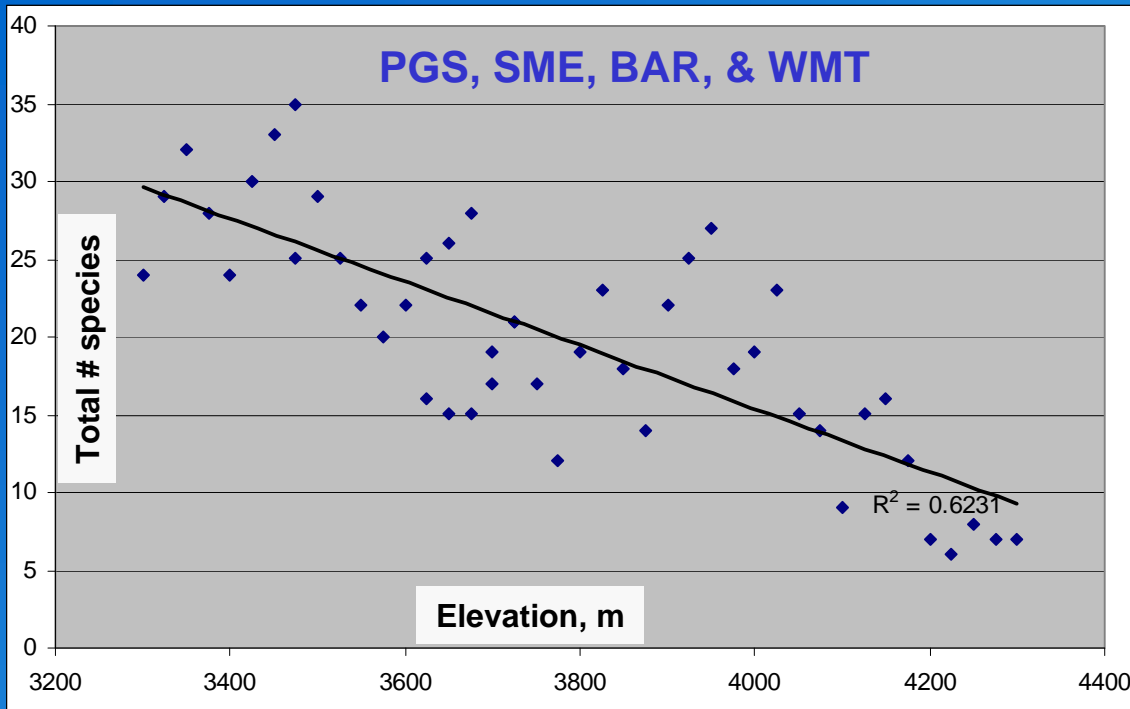


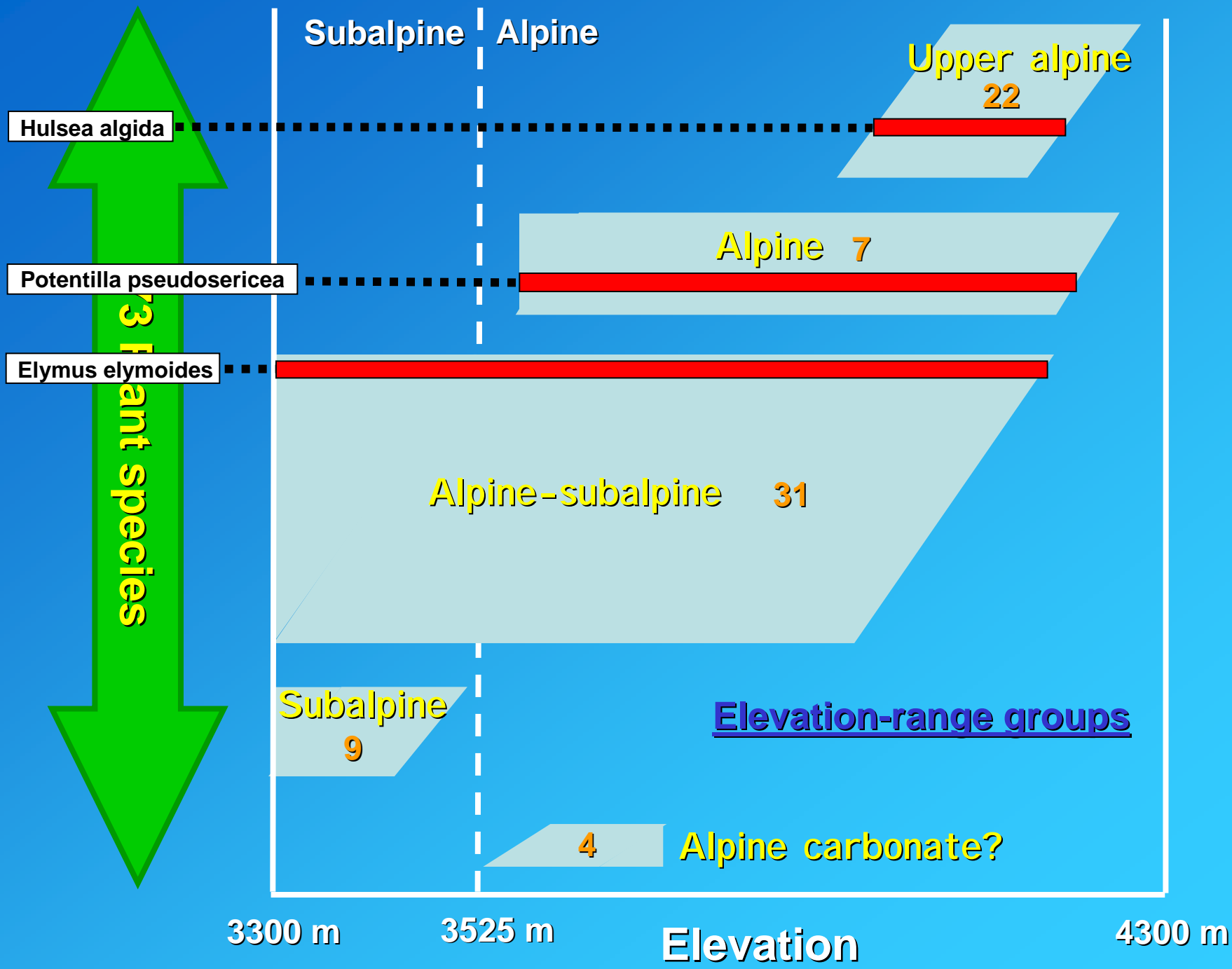
Cover = # hits;
100 total

Frequency = # segments;
10 total (2 on BAR)

Species Richness

Variation with elevation







Polemonium chartaceum

Upper alpine
22



Erigeron vagus

Steve Matson (2004) CalPhotos



35 **Hulsea algida**

Elevation

4300 m



Alpine

Penstemon heterodoxus

Alpine 7



Potentilla pseudosericea

Dean W. Taylor (2007) CalPhotos



Trifolium andersonii

Dan Post (1999) CalPhotos

Elevation

4300 m

Draba oligosperma | Alpine

Steve Matson (2004) CalPhotos



Chrysothamnus viscidiflorus



Alpine-subalpine 24

Eriogonum gracilipes



Elymus elymoides

Br Alfred Brousseau, St. Mary's Coll.

3525 m



Erigeron clokeyi

Christopher Christie (2003) CalPhotos



Lesquerella kingii



Pinus longaeva

Subalpine

9

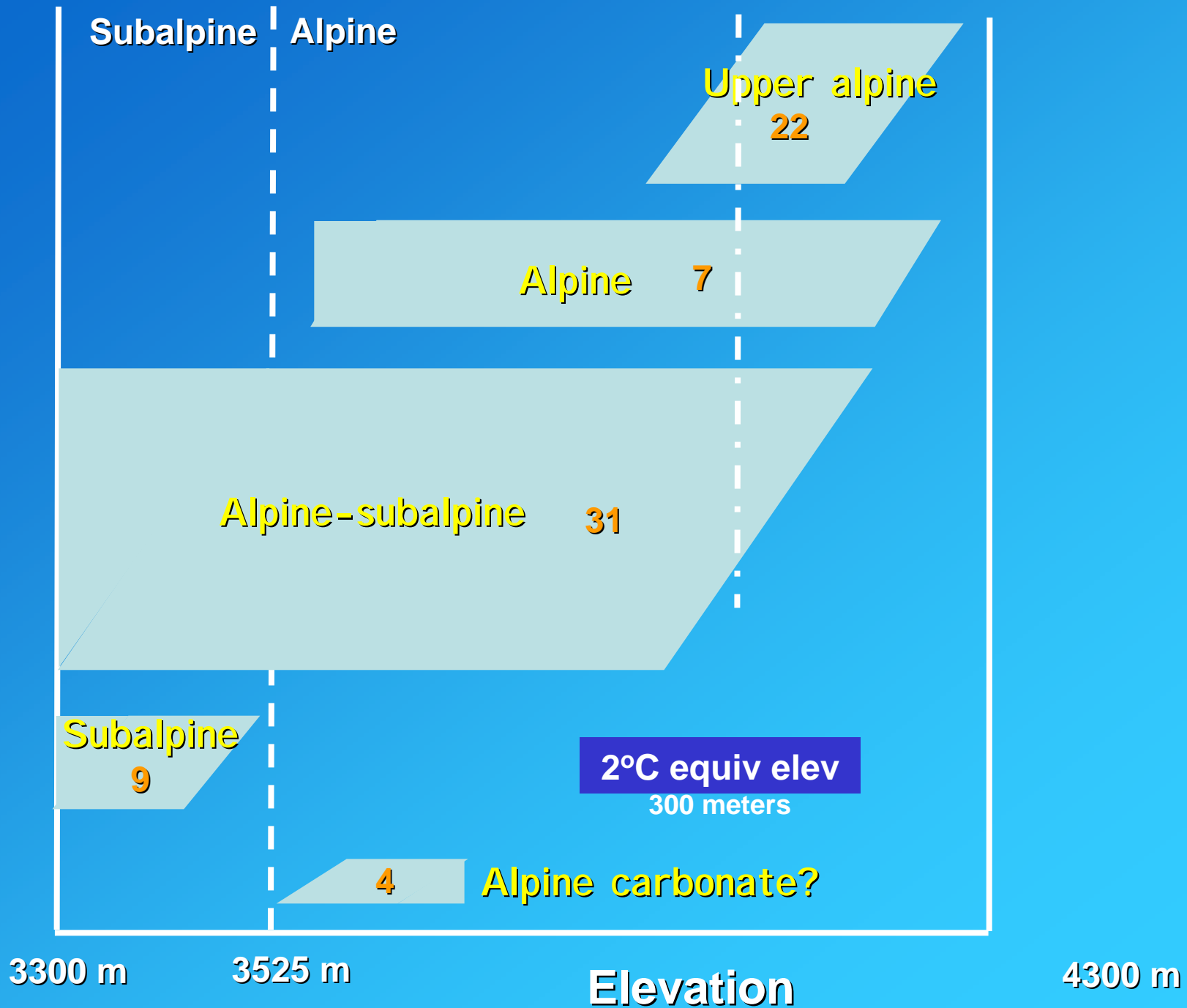
Alpine

3300 m

3525 m

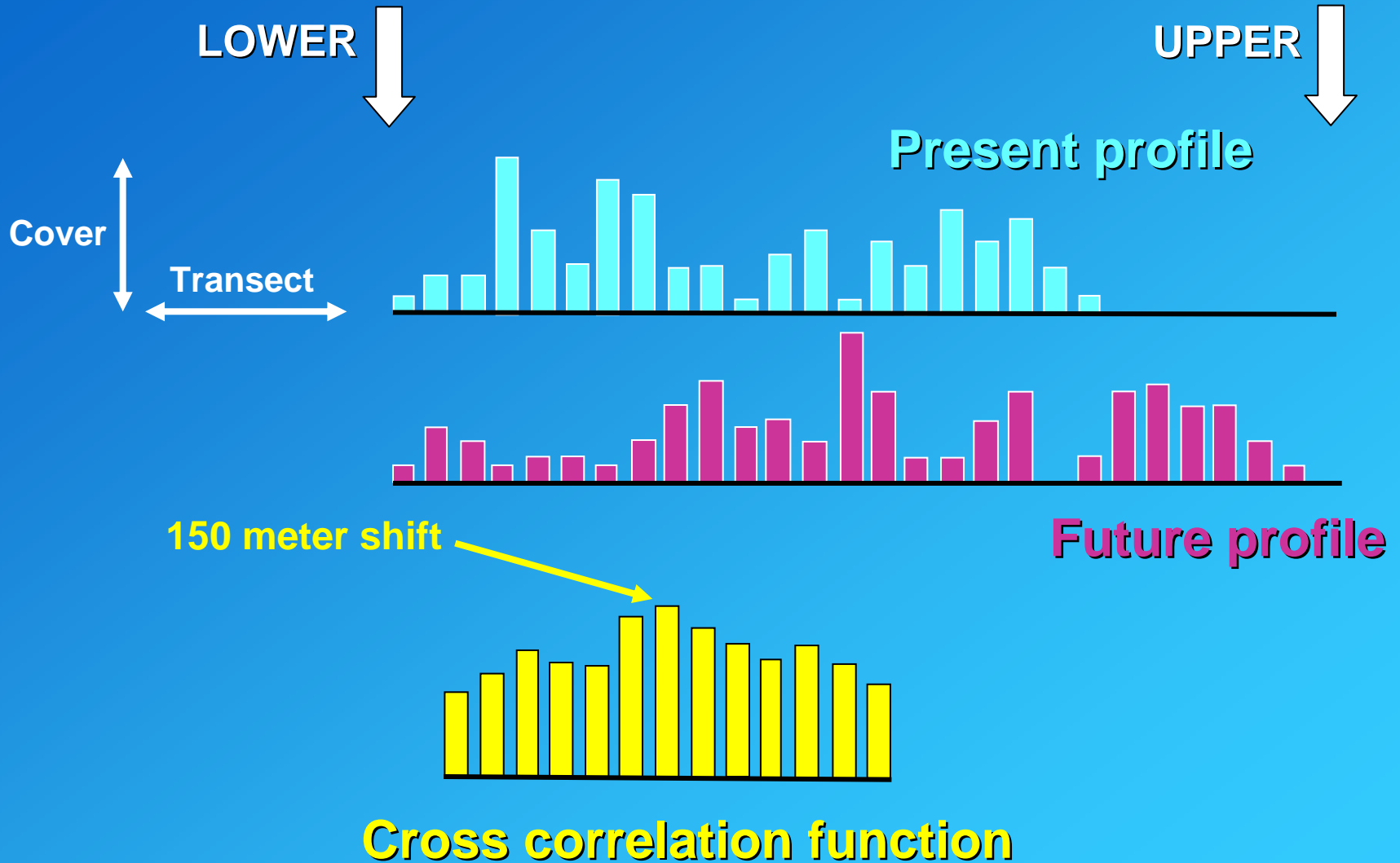
Elevation

4300 m



Cross correlation of profiles

Trifolium andersonii



Summary & thoughts of future developments

There are discernible groups with different ecological responses to climate changes; Patterns will change

Comparing profiles of distribution might result in more accurate assessments of elevation shifts

What ecophysiology characterizes the different groups?

Develop an "abundance index" that combines the point-count data with the occurrence-frequency data.

For example $AI = (1 + cvr)^N (frq)$

Resurvey periodically to assess elevation shift, and relate that to temperature increases, and to species

Integrate with other GLORIA data

Apply statistically more sophisticated analyses