Development of a Methodology for Building Fire History in Great Basin Shrub-grass Landscapes

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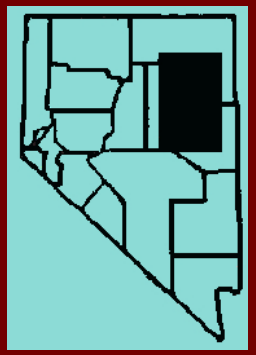
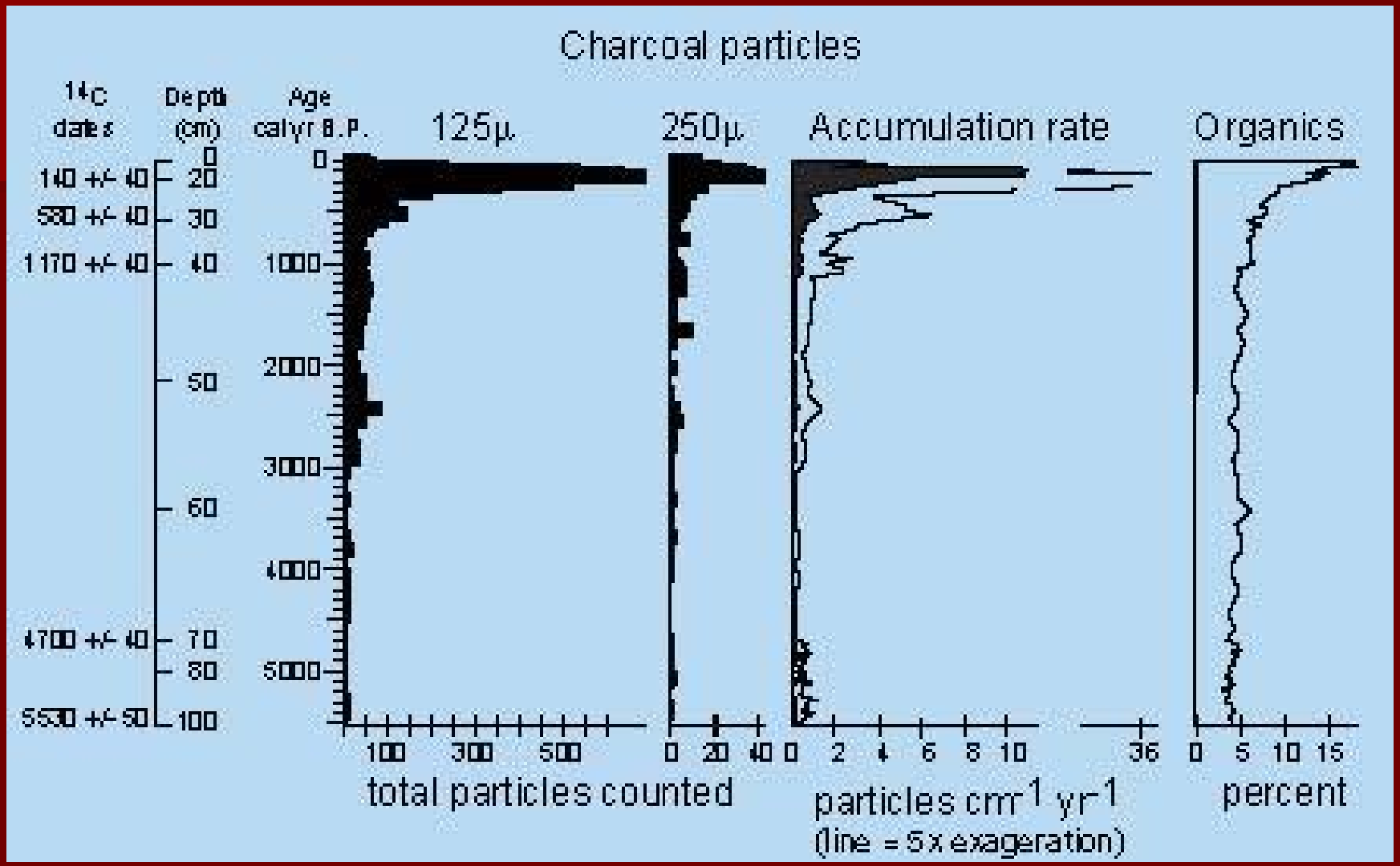
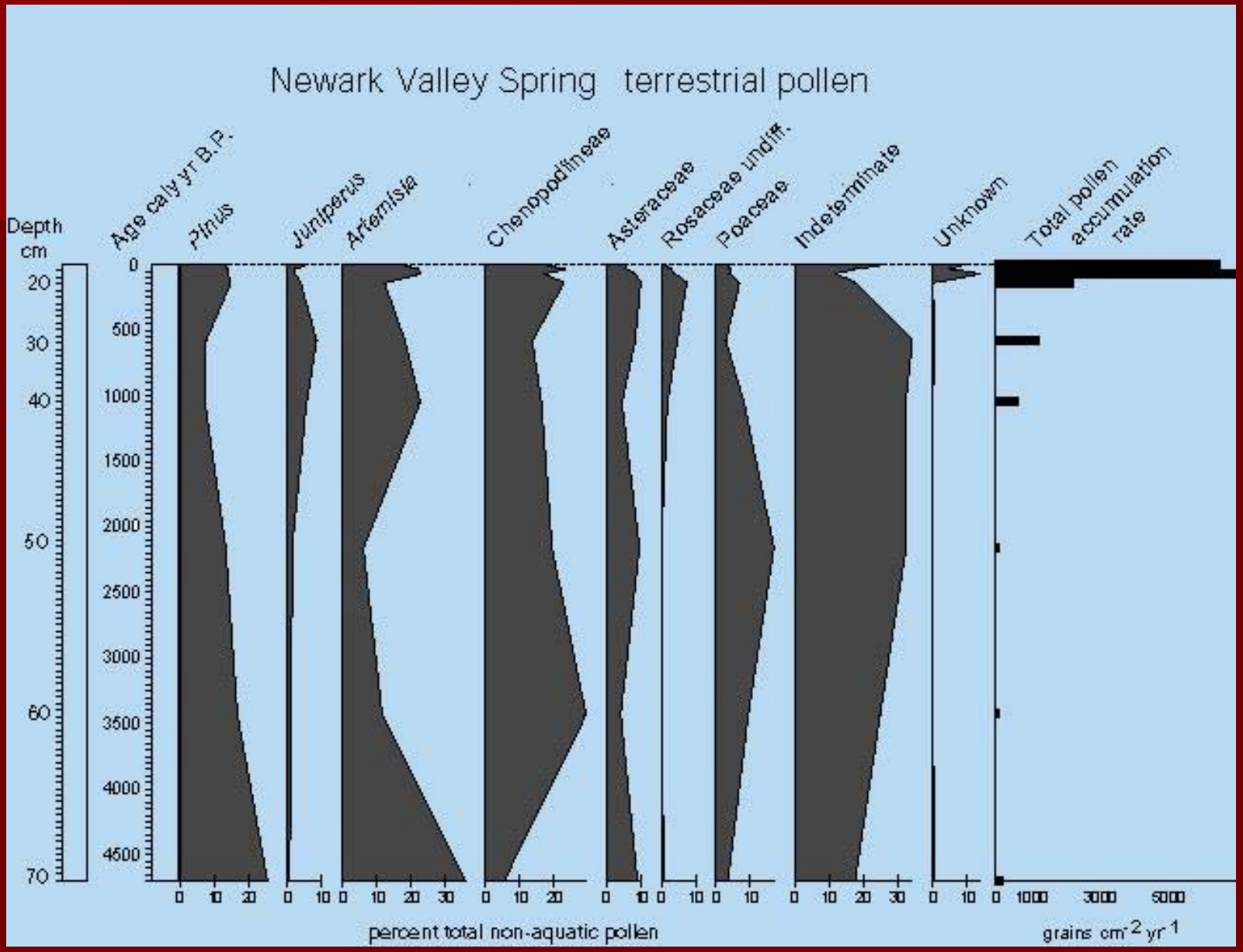
Data Sources

- **Wetland Sediment Cores**
  - Charcoal
  - Pollen
  - Phytoliths
  - Cuticles
- **Woodland Trees**
  - Fire-scars
  - Dendroclimate sequence
- **Historic records**
  - Ethnographies
  - Newspapers
- **Archaeological Deposits**
  - Artifacts, including faunal remains
  - Charcoal
  - Phytoliths
- **Paleontological Deposits**
  - Animal remains

Newark Valley



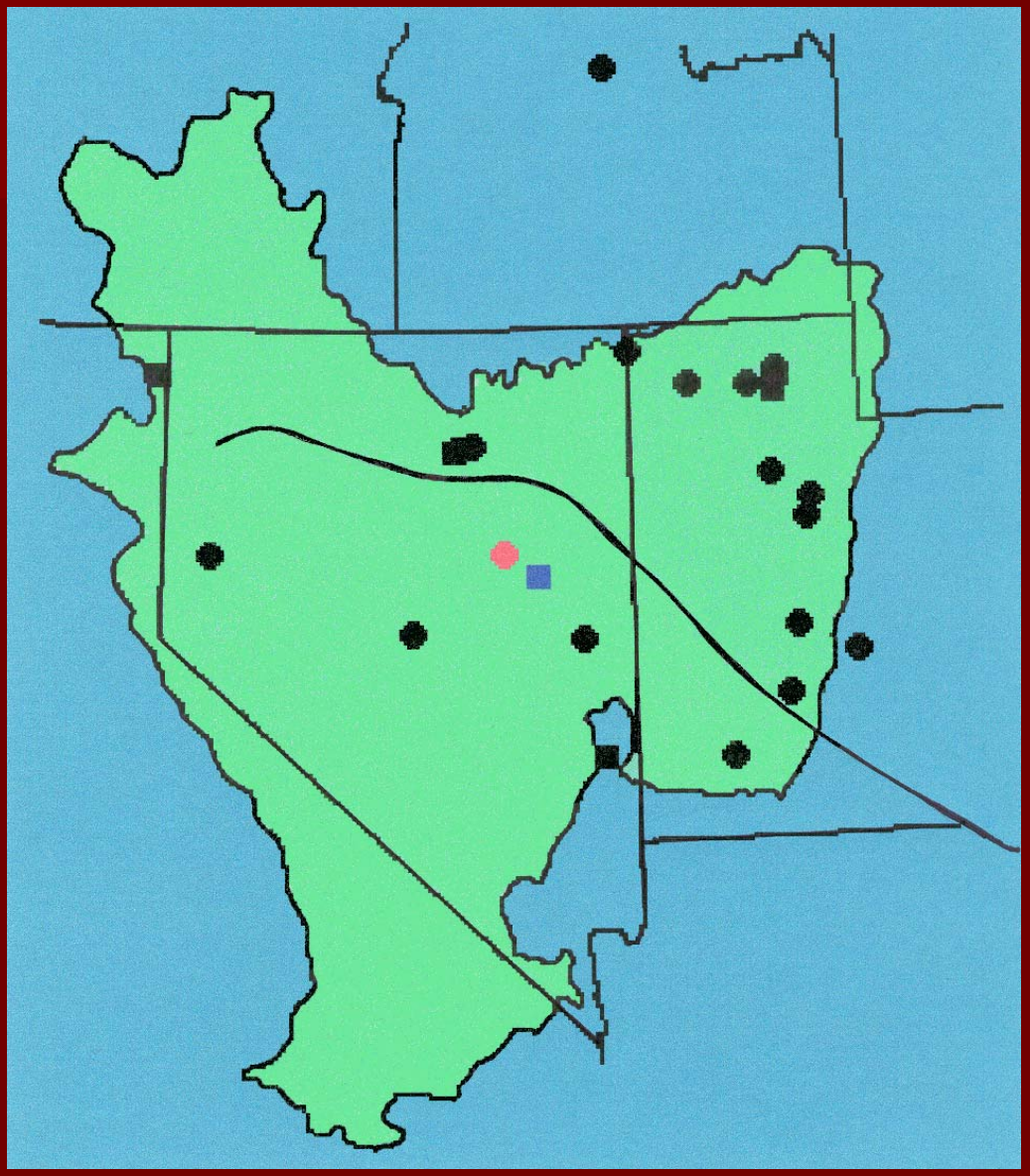

Charcoal particles
14C dates
Depth (cm)
Age calyr B.P.
125µ
250µ
Accumulation rate
Organics
140 +/- 40
580 +/- 40
1170 +/- 40
4700 +/- 40
5530 +/- 50
0
20
30
40
50
60
70
80
100
1000
2000
3000
4000
5000
100
300
500
0
20
40
0
2
4
6
8
10
36
0
5
10
15
total particles counted
particles cm-1 yr-1
(line = 5x exageration)
percent


Newark Valley Spring terrestrial pollen
Depth cm
Age cal yr B.P.
Pinus
Juniperus
Artemisia
Chenopodiineae
Asteraceae
Rosaceae undiff.
Poaceae
Indeterminate
Unknown
Total pollen accumulation rate
20
30
40
50
60
70
0
500
1000
1500
2000
2500
3000
3500
4000
4500
0 10 20
0 10
0 10 20 30
0 10 20
0 10
0 10
0 10
0 10 20 30
0 10
0 1000 3000 5000
percent total non-aquatic pollen
grains cm-2 yr-1

Newark Cave

Bison records for the last 1500 years

with Seton's estimate of southern limit of bison range at AD 1500



White Sage Wash Bison

Phytoliths

Silica bodies that form in plant tissues

- Insoluble silica minerals preserve well in most sediments
- Can be separated from their surrounding matrix by flotation in heavy liquids
- Difficult to identify to genus or species, but
- Refractive index changes when heated

Conclusions

- Both known and prehistoric fires are recorded in wetland and archaeological sediments
- Prehistoric fires were smaller and less frequent than historic fires
- Prehistoric fuel accumulation appears to have been a function of climate, and possibly anthropogenic activity, rather than fire frequency
- Treeless landscapes respond differently to fire suppression than woodlands and forests

Directions for Future Studies

- Replication in a nearby valley
- Replication in treeless valley with different dominant shrub vegetation
- Further experimentation with phytolith studies