

Temporary Wetland Bioassessment: Limitations and Opportunities



D. Christopher Rogers



Crogers@ecoanalysts.com





Vernal Pools, Relict Dune Pools





Floodplain Pools, Wet Meadows, River Rise Pools, Snowmelt Pools

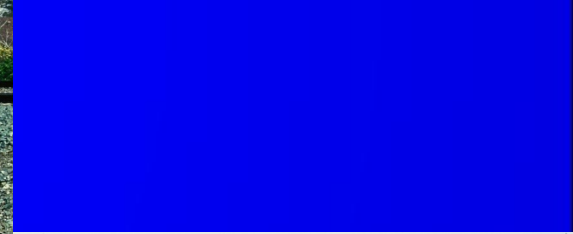




Desert Playas, Rock Outcrop Pools

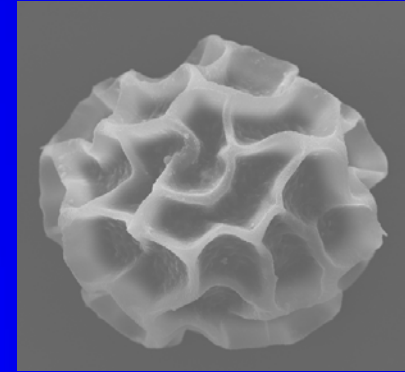


Artificial Seasonal Wetlands





Low corner of a
agricultural field, Kansas,
USA



Wet Season



Dry Season





May 1998



June 1998



1991



1990



Macroinvertebrate Phyla

- Porifera
- Platyhelminthes
- Nematomorpha
- Annelida
- Bryozoa
- Mollusca
- Arthropoda



Platyhelminthes (Flatworms)



- Taxonomy unknown
- At least 12 species
- Various trophic levels
 - Predators
 - Scavengers
 - Symbiotic algae



Insects



- Good taxonomy for adults and larvae
- Collembola
- Odonata
- Ephemeroptera
- Trichoptera
- Hemiptera
- Lepidoptera
- Coleoptera
- Diptera

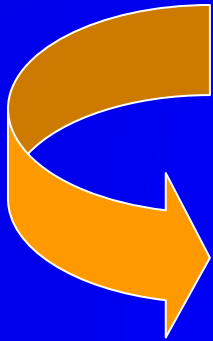


Crustacea



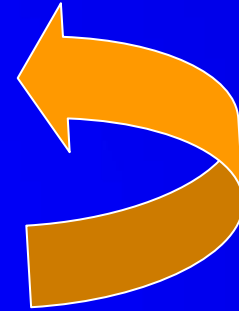
- Branchiopoda
 - Anostraca
 - Notostraca
 - Laevicaudata
 - Spinicaudata
 - Cladocera
- Copepoda
- Ostracoda

Temporal Succession



Dry Season

Wet Season

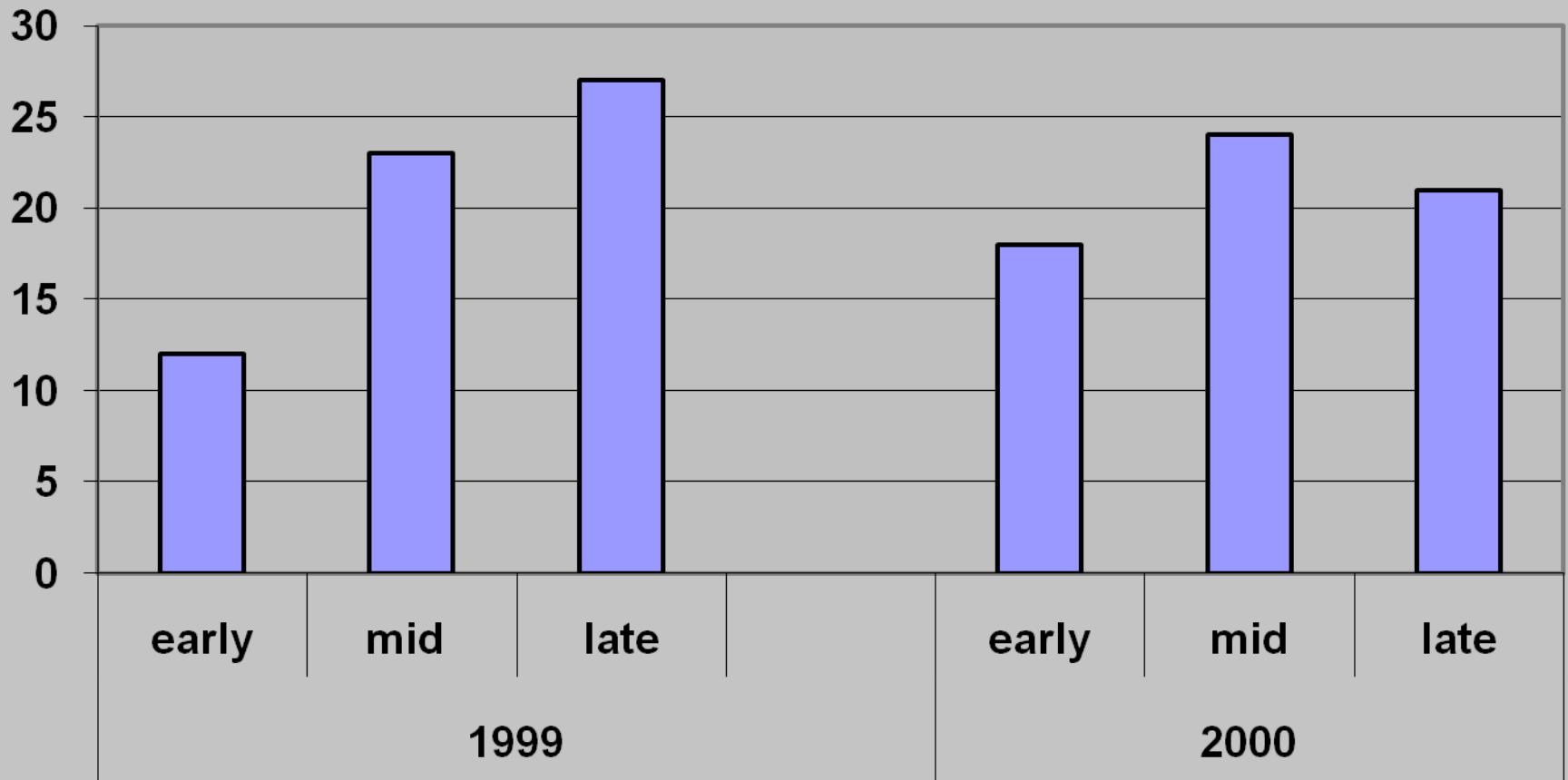


Temporal Succession

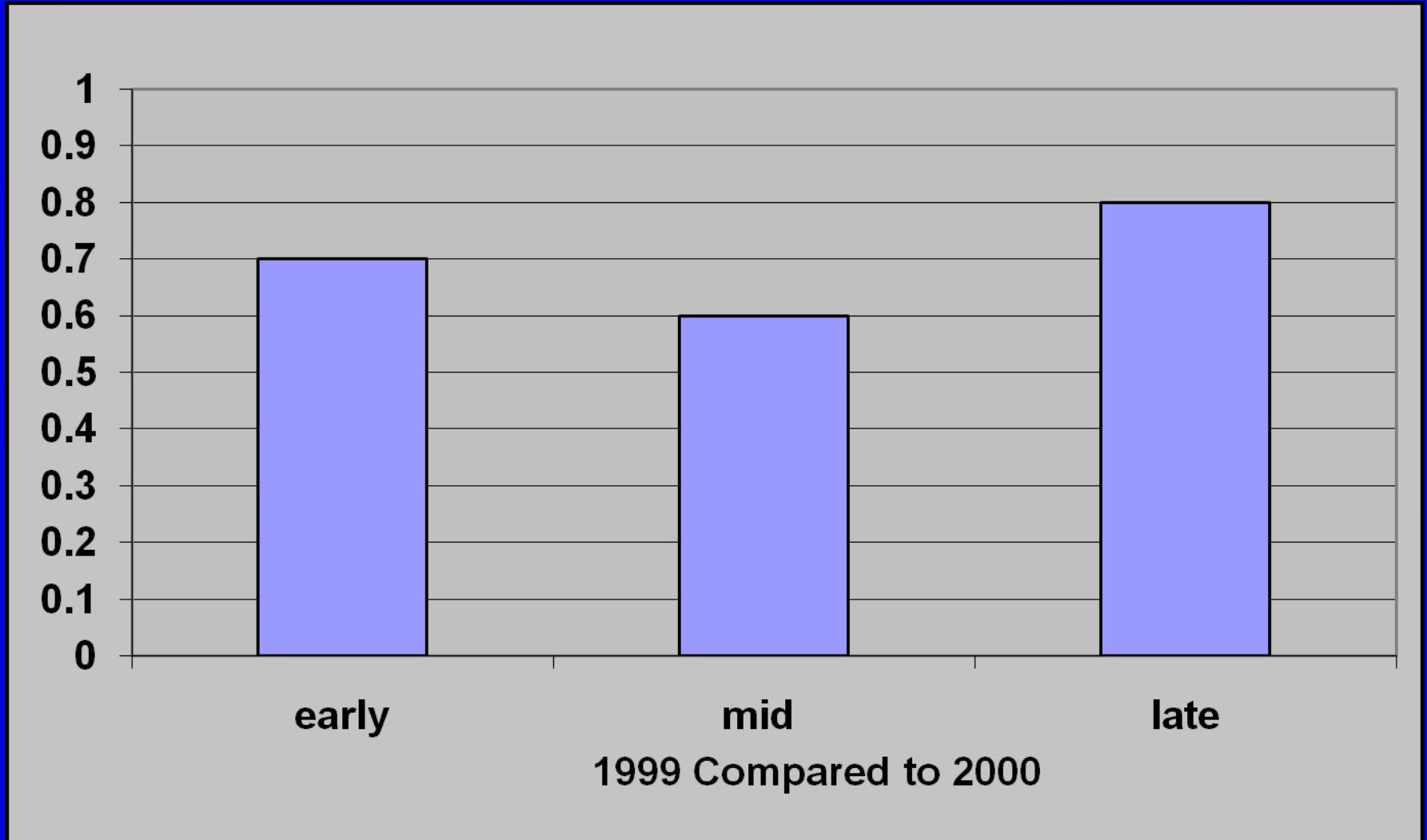


Temporary Wetlands from CA, OR, NV and NM

of Invertebrate taxa averaged from 193 Pools

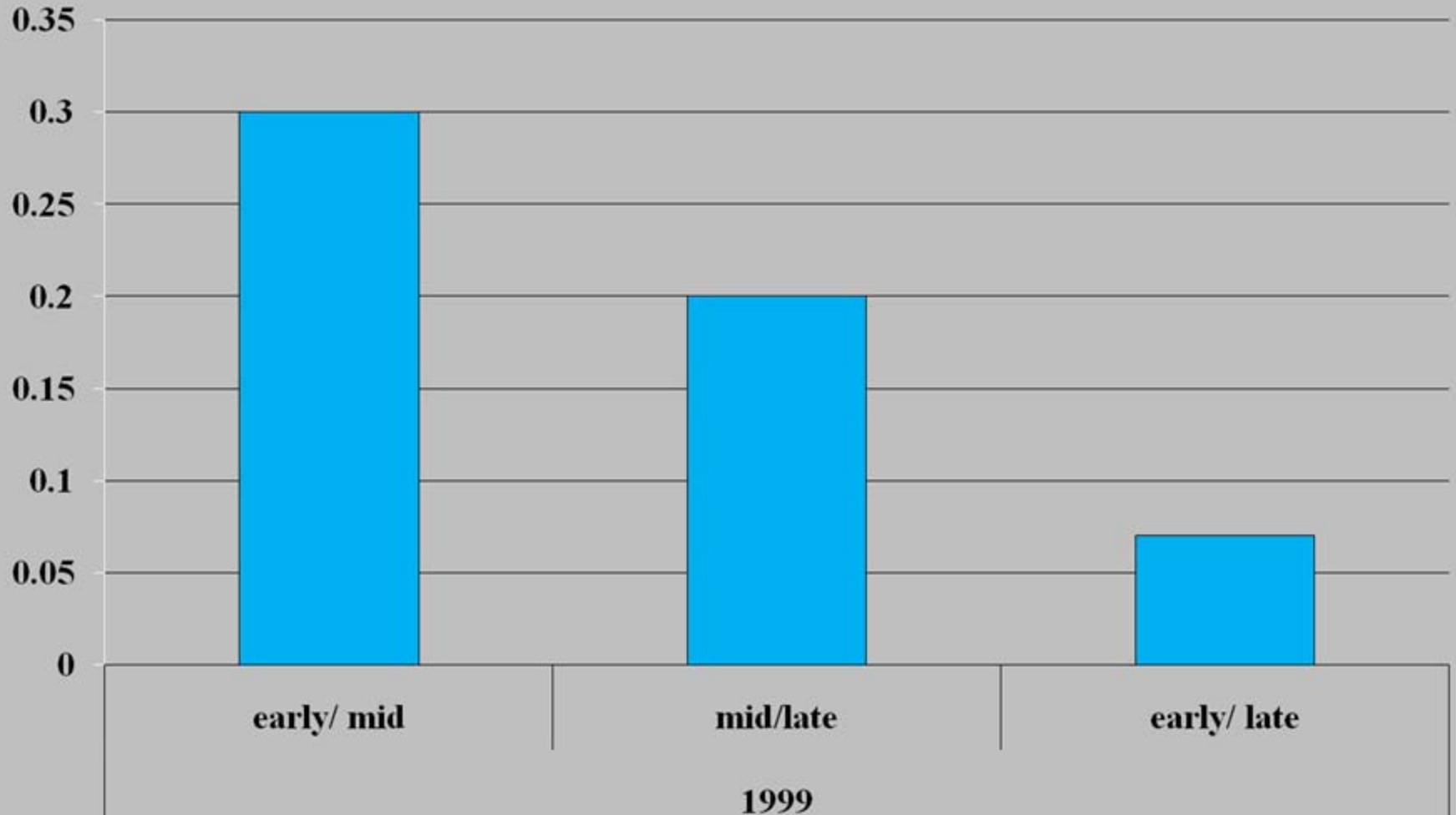


Jaccard Coefficient of Community Similarity

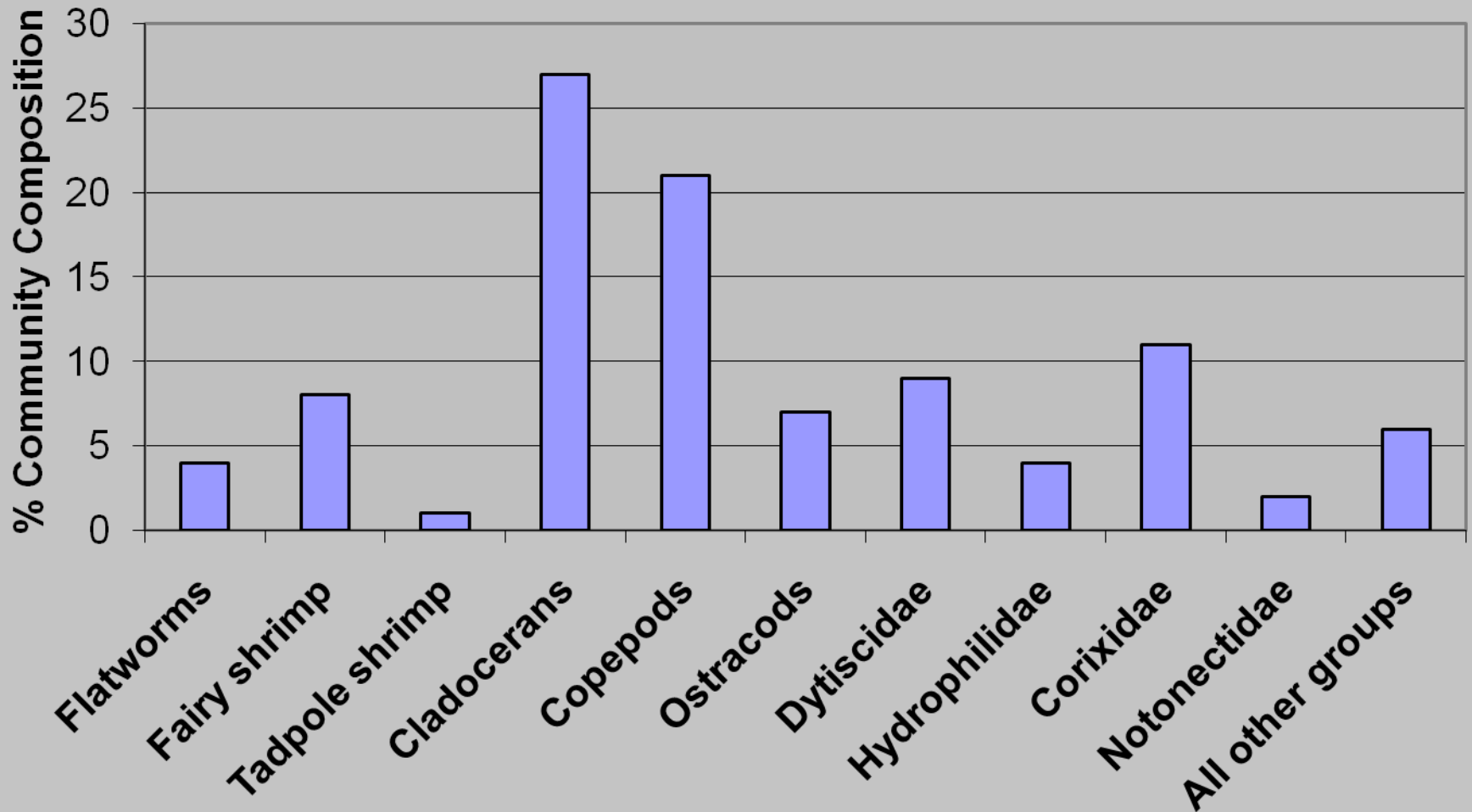


Jaccard Coefficient of Community Similarity

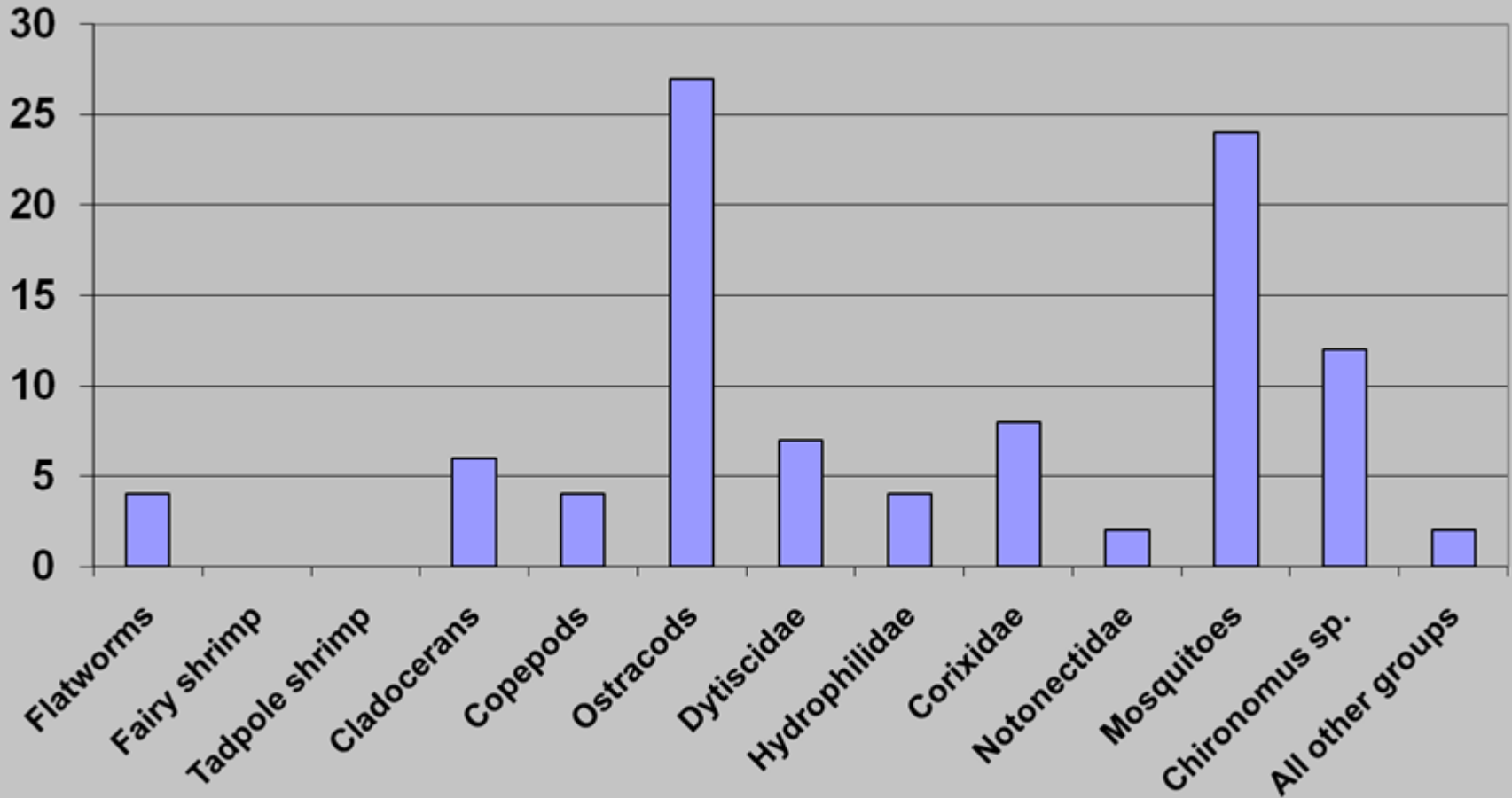
Jaccard



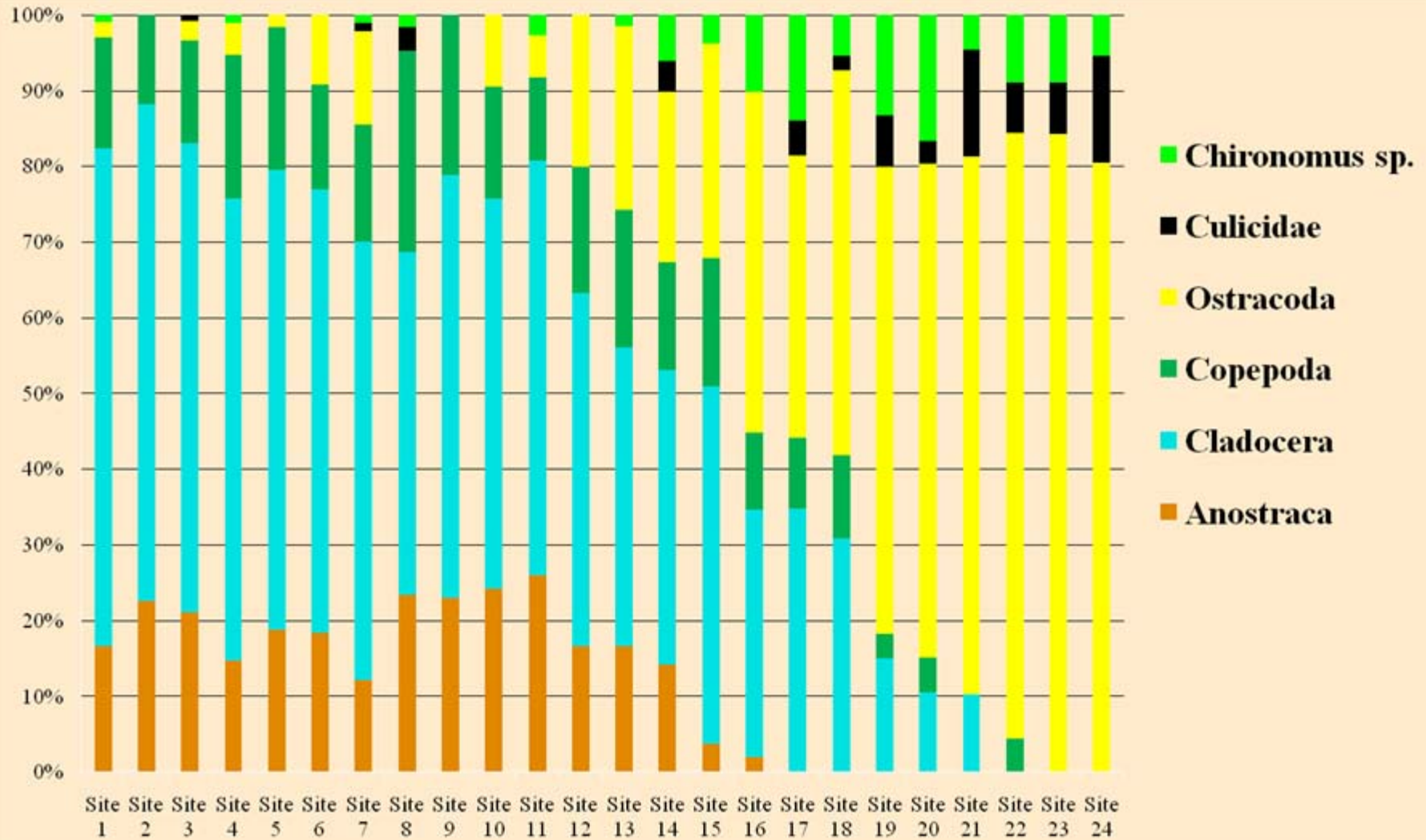
Macroinvertebrate Community % Composition, Averaged from 200 “Pristine” Seasonal Wetlands (1989, CA and OR)



Macroinvertebrate Community % Composition, Averaged from 183 Impacted Pools (1996)



% Crustacea vs Diptera

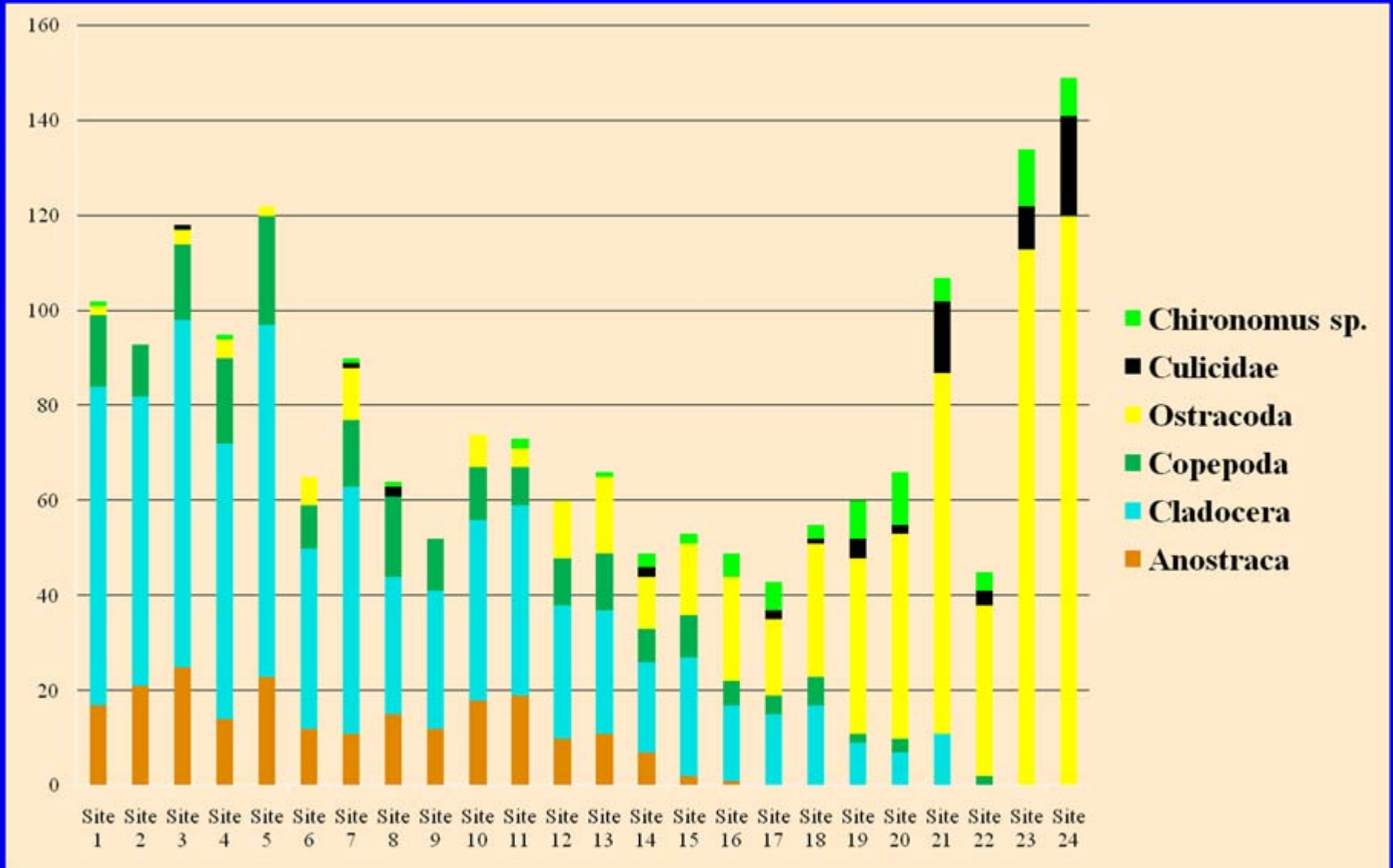


Least Impacted



Most Impacted

Crustacea vs Diptera



Least Impacted



Most Impacted

Impacts



- Road run off
- Fertilizer or pesticide run off
- Watershed damage or other hydrological alterations
- Encroachment
- Organic loading



Limitations

- Taxonomy

- Estimated 60 – 70 % of Copepods and Ostracods are undescribed.
- Flatworms completely unknown

- Reticence

- Aversion to “zooplankton”



- Endangered Species

- Cannot collect invertebrates in many areas of CA and OR without federal 10(A) 1(a) Permits



What can we do?



- % Crustacea and Crustacean Diversity provide some information.
- % Ostracoda, Mosquitoes and *Chironomus* sp. provide some information.



Is anyone doing this kind of bioassessment?

- EcoAnalysts, Inc.
- Hydrozoology
- Mundi Bioconsulting
- Actis Environmental



Why?

To assess and monitor overall habitat functionality and quality.

- Impacts to habitats.
- Habitat restoration.
- Constructed wetlands.
- Mitigation.



... and there are white literature papers on this type of monitoring in seasonal wetlands!

Thank you!



ecoanalysts.com