Slide 1

Introduction to California's Vegetation

Lecture 19

Slide 2

Learning Outcomes

- Definitions:
- Vegetation
- Flora
- Concept of Plant Community
- Vegetation Types
- Interspecific Competition
- Fundamental and Realized niches

Slide 3

Vegetation v Flora

- Vegetation
- Life forms
- herbaceous v shrubs v trees
- Flora
- List of species
- Taxonomic

Slide 4

Categorizing Vegetation

- Purpose
- Provide information on natural resources
- E.g. how many acres of Redwood forest
- Munz and Keck (1969) identified 29 Vegetation Types
- Cheathham and Haller 145
- California Natural Diversity Database (CA Dept Fish and Game) 260
- Units are subjective and depends upon the goals of the survey

Slide 5

Changing Concept of Plant Community

- Definition (1974)
- Regional assemblage of interacting plant species characterized by the presence of one or more dominant plant species
- 2003
- Composition of plant in an area is a chance event
- Presence of a plant species determined by individual requirements and range of tolerance of each plant species

Slide 6

Vegetation Types

- Landscape unit characterized by a dominant plant growth form or dominant species
- E.g. grassland
- Chaparral
- Oak Woodland

Transitional Boundaries

- Zone between two vegetation types
- May be sharp
- Or gradual
- Determined by changes in physical environment
- Rock type
- Soil water availability

Saltmarsh an example of A Vegetation Type

- Coastal
- Shallow slopes where silt is deposited
- Characterized by
- Perennial plants
- Herbaceous plants at lowest locations
- Some shrubs
- halophytes

Different Views of Redwood Forest

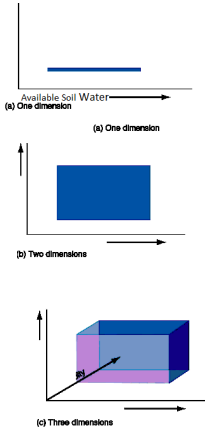
- Redwood forests are dominated by *Sequoia sempervirens*
- Associated species
  - Giant chain fern
  - Redwood Sorrel
- Douglas-Fir *(Pseudotsuga menziesii)*
  - (distributed CA to Alaska)
- Redwood Forests categorized as an element of Northern Coastal Forest (Ornduff) or as a distinct Vegetation type (Munz)

Ecological Niche

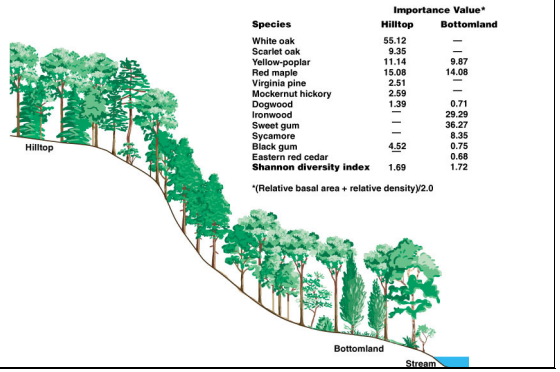
- Functional role of a species in the community, including activities and relationships.
- If a habitat is where an organism lives
- Niche is how it makes it's living

Niches have Multiple Dimensions

- Range of tolerance in one dimension
- Available Soil Water
- Second Dimension
- Salinity
- Third Dimension
- Soil oxygen level
- (tolerance of being submerged)



Vegetation Zonation



Species	Importance Value* Hilltop	Bottomland
White oak	55.12	—
Scarlet oak	9.35	—
Yellow-poplar	11.14	9.87
Red maple	15.08	14.08
Virginia pine	2.51	—
Mockernut hickory	2.59	—
Dogwood	1.39	0.71
Ironwood	—	29.29
Sweet gum	—	36.27
Sycamore	—	8.35
Black gum	4.52	0.75
Eastern red cedar	—	0.68
Shannon diversity index	1.69	1.72

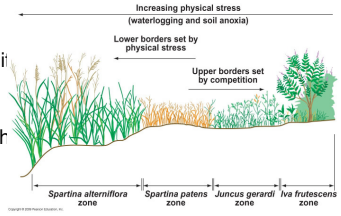
*(Relative basal area + relative density)/2.0

Changing Concept of Plant Community

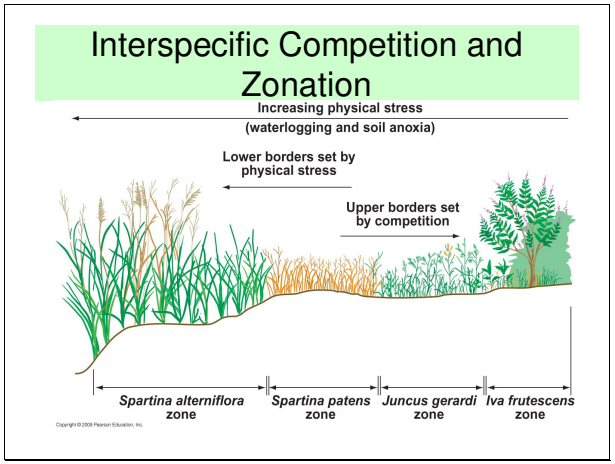
- Definition (1974)
- While animals and plants have numerous interactions in an ecological community
- Herbivores are plant predators
- Mutually beneficial relationships
- Pollinators
- Seed dispersers
- Plants generally compete for the same resources

Interspecific Competition and Zonation

- Saltmarsh Zonation
- Each species zone defined by
- Tolerance to environmnetal condi
  - Low soil oxygen
  - Salinity
- And competition with other species



Slide 15



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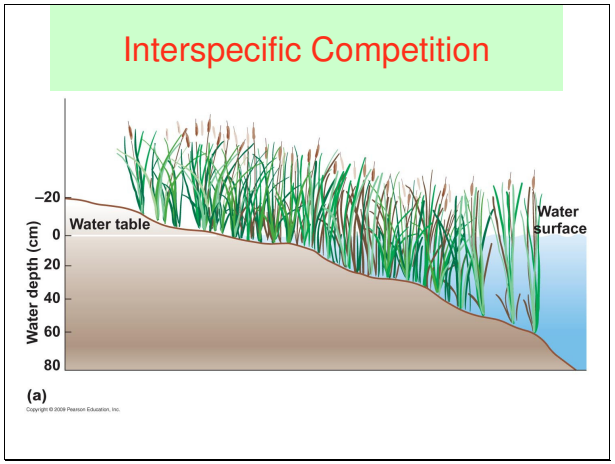
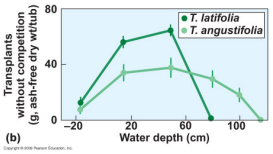


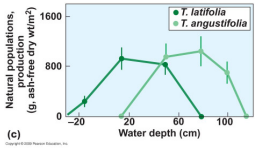
Niches can Overlap

- Typha latifolia
- Typha angustifolia
- Grown without competition
- overlap
- Both grow at 50cm depth



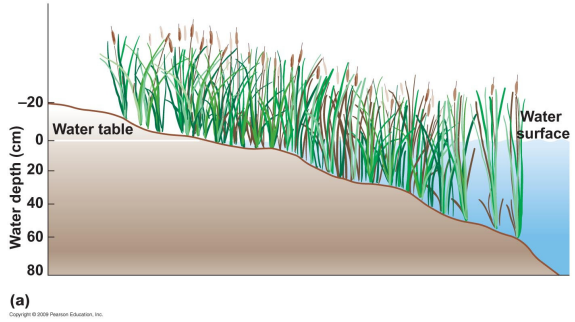
Competition Determines Realized Niche

- Typha latifolia outcompetes
- T. angustifolia in shallow water



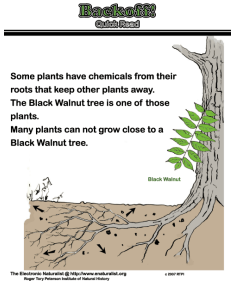
Slide 19

Interspecific Competition



Slide 20

Alellopathy



- Production and release of chemicals by one species
- Inhibits germination and/or growth in another species
- California Walnut
- Bracken