ABIOTIC CONTROLS
CA Central Coast

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Dr. Doug Smith
School of Natural Sciences
Cal State Monterey Bay

Hyatt
Premise

The diversity and distribution of abiotic environmental factors influences the diversity and distribution of plant communities.
ABIOTIC CONTROLS
CA Central Coast

• Geologic evolution of the central coast
  • Resulting tapestry of parent materials
  • Resulting tapestry of consequent soils
• Geomorphologic evolution
  • Mountains
  • Sea level, sand dunes and terraces
  • Slopes, aspect, disturbance
• Climate and microclimate
ABIOTIC CONTROLS
CA Central Coast

- Geologic evolution of the central coast
- 100 Ma Subduction
- 20 Ma northward translation 100’s km
- 20 – 5 Ma Deformation, deep marine, shallow marine
- 2 Ma Mountains
- < 2 Ma Sea level, dunes and terraces
A couple of anatomical details:

**Trench, Fore-arc basin, accretionary wedge**
Indian Plate
Asian Plate

Indonesia
Modern example of ancient California Subduction zone
Indonesia Analog for California

trench
Indonesia Analog for California

- Trench
- Fore-arc Basin
- Accretionary Wedge
- Volcanoes with granite roots
Indonesia Analog for California
GEOLeGIC MAP OF CALIFORNia
Compiled by U.S. Geological Survey
And California Division of Mines and Geology

Scale 1:2,000,000

EXPLANATION

Sedimentary and volcanic rocks

Granite-marble
Granite-granodiorite
Granite-plutonic rocks
Granite-migmatite
Granite-mylonite
Granite-schist
Granite-biotite schist
Granite-biotite gneiss
Granite-biotite gneiss

Intrusive igneous rocks

Granite
Granodiorite
Diabase
Diorite
Andesite
Basalt
Rhyolite

text
Dune Deposits  
Cont. Sedimentary

Nearshore Sandstone

Deep Marine Shale

Conglomerate

Granitic Rocks

Misc. Metamorphics

Age  Millions of Years

>2

3

5

10

55

65

200
Example of abiotic control on communities
Example of abiotic control on communities
Accretionary wedge: Serpentinite soils
Low CA and High Mg

White-flowered *Allium falcifolium* on serpentine. Photo by Sydney Carothers.
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Time variability as well----Med. climate
Foggy micro climate
Caused by Monterey Canyon
Redwoods love Monterey Canyon
Regolith thickness 0 to 2 m
Aspect 0 359
Slope 0 to 80
Rain 20 to 70
Fog---local influence
Parent material granite, marble, schist, other
Disturbance: Fire, landslides, firebreaks
Big Sur landslide on May 20, 2017
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