

The Unique & Diverse Ecology of California

1888 "Unique Map of California"
Produced by the
Southern Pacific Railroad and
the CA State Board of Trade



California Biodiversity

	Biodiversity Rank for CA among all US States
Richness	1
Endemism	1
Rarity (% at risk)	2

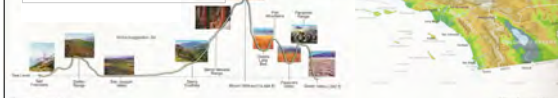


Taxon	CA Spp Richness	US Spp Richness	% of US Spp in CA	Taxon	#CA Endemics	Rank among US States
Vascular Plants	5,047 (6,272 var.)	15,890	32%	Vascular Plants	2,153	1
Amphibians	51	231	22%	Amphibians	17	1
Reptiles	84	283	30%	Reptiles	5	1
Birds	433	768	56%	Birds	2	2
Mammals	197	416	47%	Mammals	17	1
FW Fish	67	799	8%	FW Fish	20	1

Topography

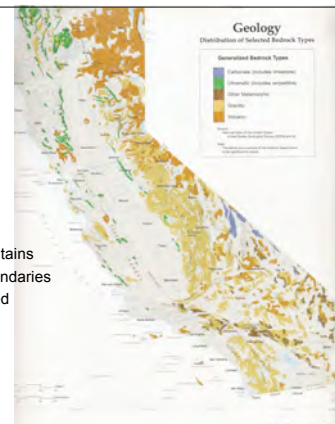
- Long coastline
- Series of mountains and valleys in close proximity
- Rapid transitions in elevation, slope, soil type, rain harvest/shadow, solar exposure
- Isolated populations/communities
- Snow pack → year-long water

Highest and lowest points in continental US within 80 miles of each other, and 200 miles of the coast.

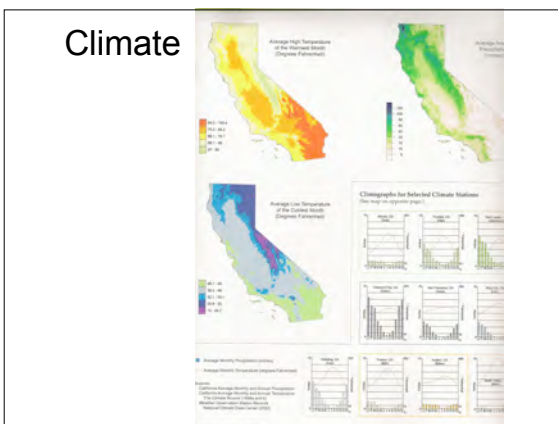


Geology

- Igneous rock: volcanic mountains
- Metamorphic rock: plate boundaries
- Sedimentary rock: old seabed



Climate



Climate

- Major climate types
1. Mediterranean
 2. Steppe
 3. Cool interior
 4. Highland
 5. Desert



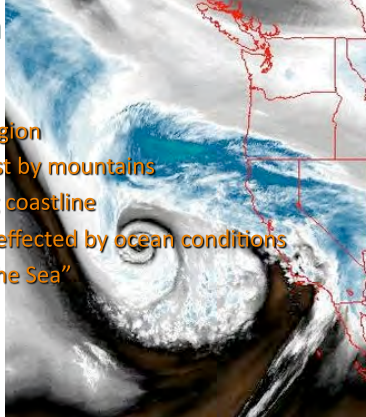
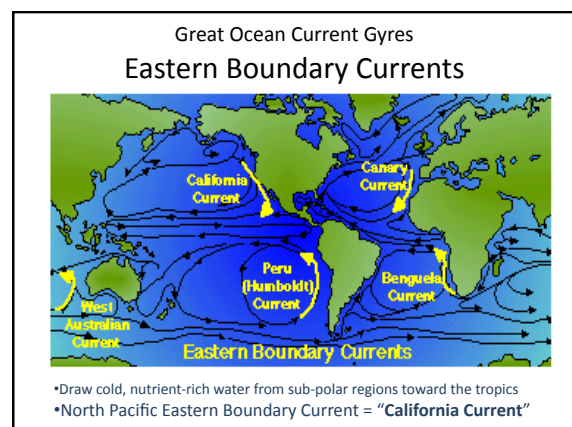
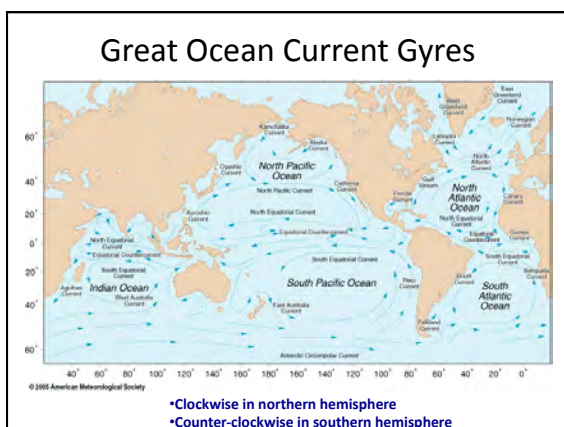
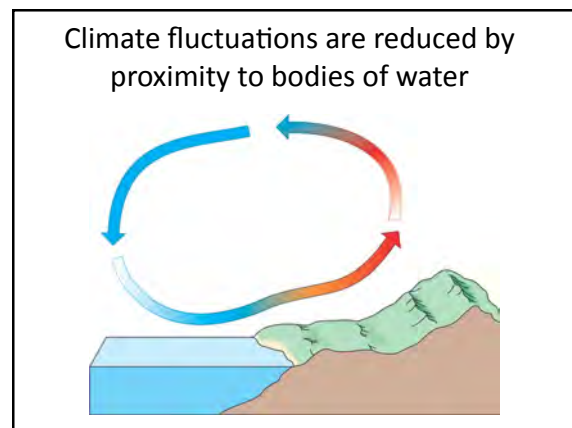
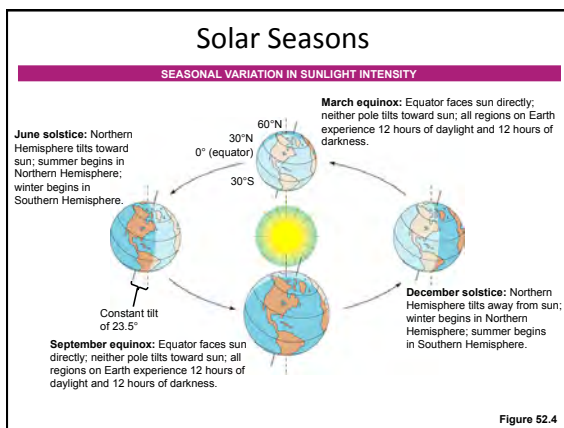
California Ecology

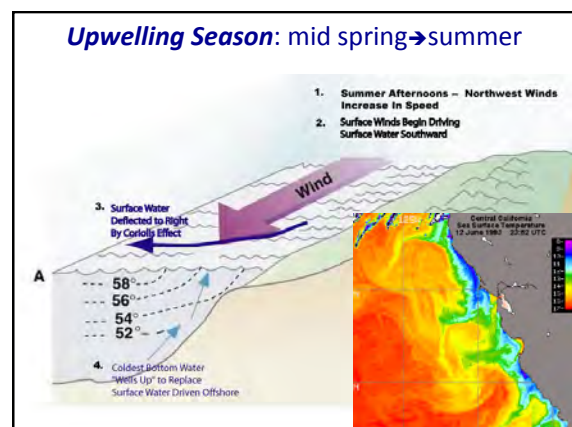
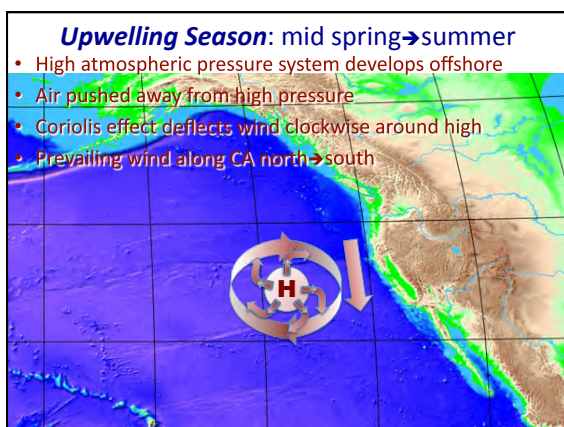
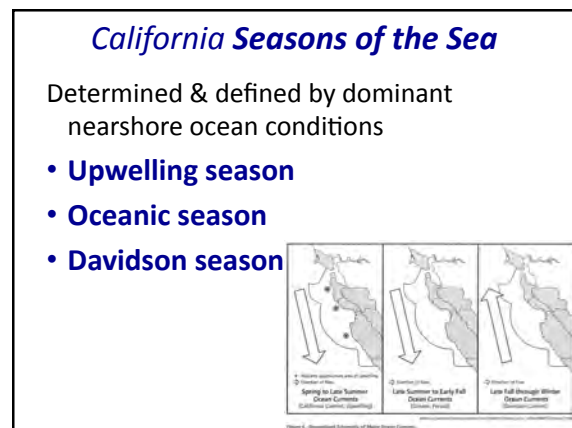
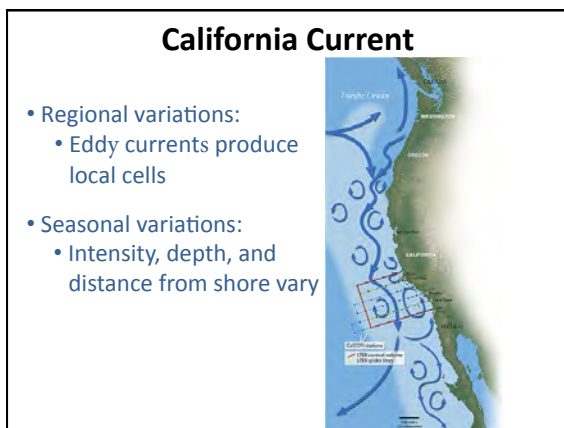
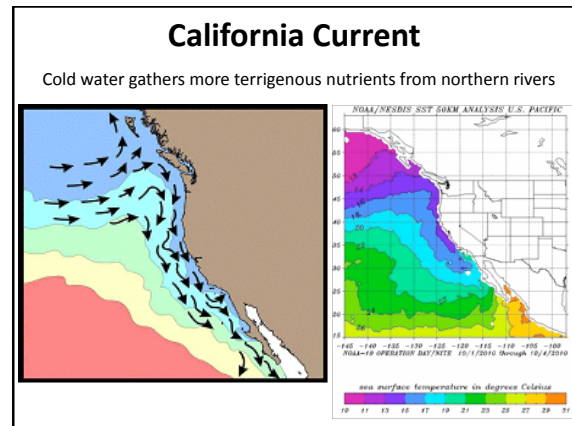
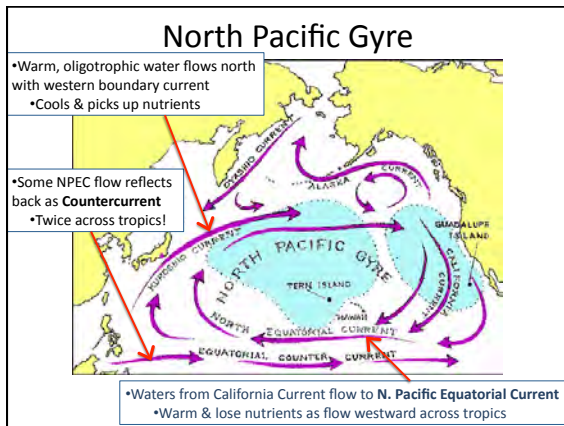
- Long, narrow region
- Bordered on east by mountains
- On west by long coastline
- Climate greatly effected by ocean conditions
 - “Seasons of the Sea”

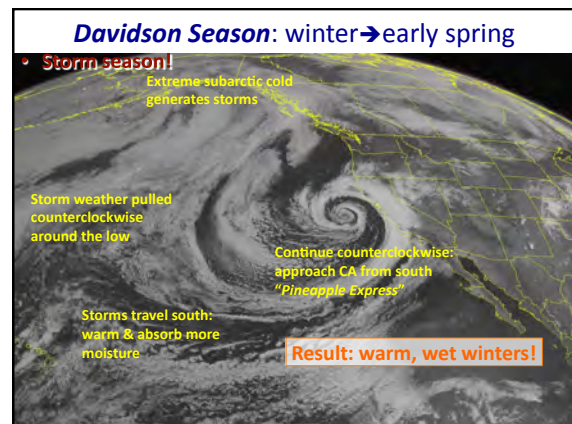
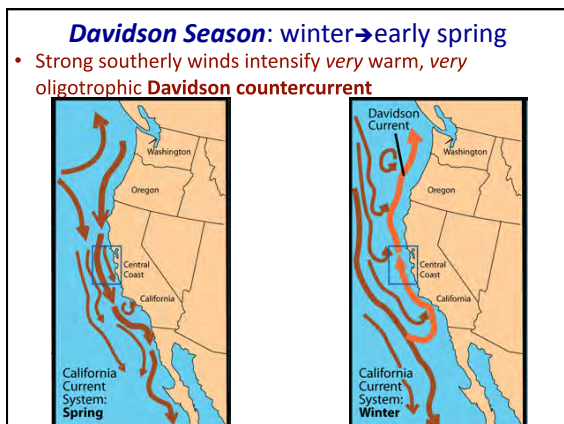
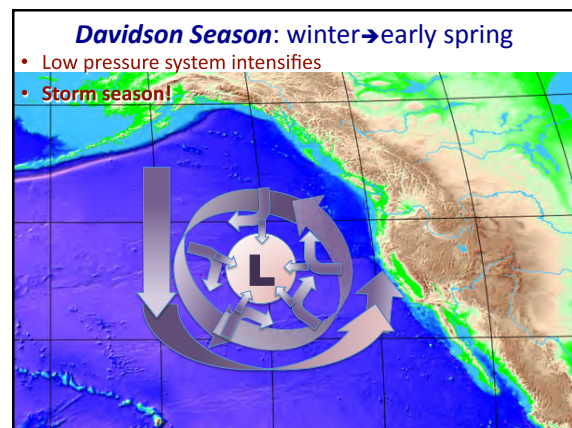
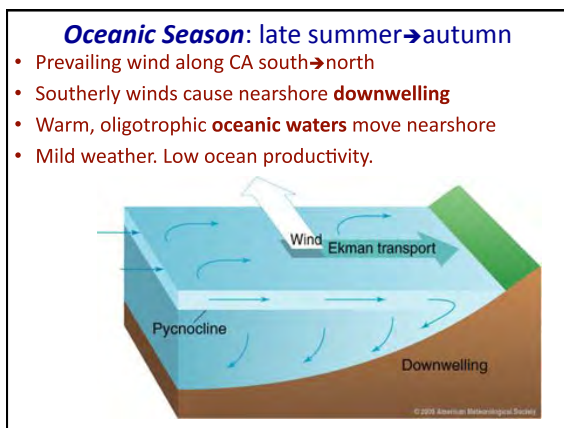
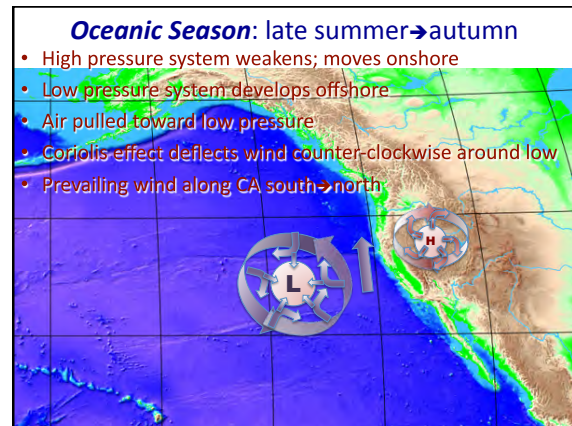
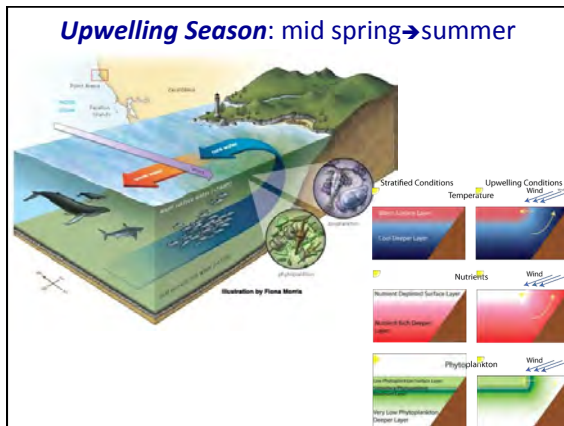


California Ecology

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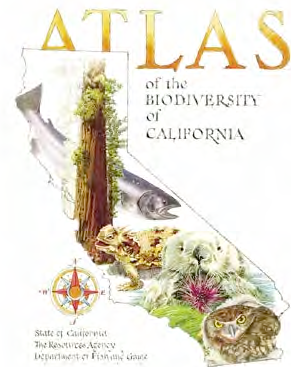
Vegetation

- California Floristic Province (CA-FP)
 - west of Sierra Nevadas & south of Cascade Range
- Much of Mediterranean climate lands converted to urban & agricultural

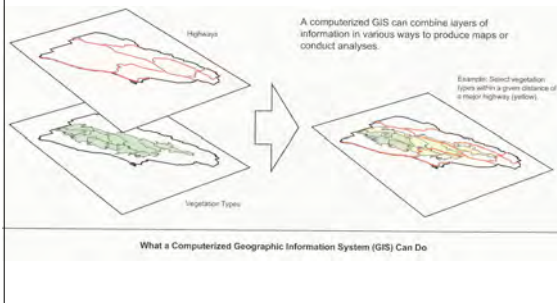


Mapping California's Biodiversity

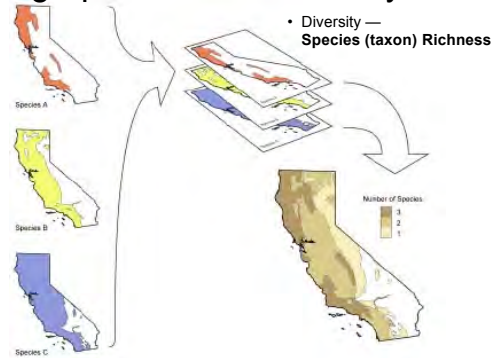
- 2003
- CA Dept. of Fish & Game project
- Use published distributions to create resource map to identify localities of significant:
 - Richness (diversity)
 - Rarity (special status)
 - Endemism



Geographical Information Systems (GIS)

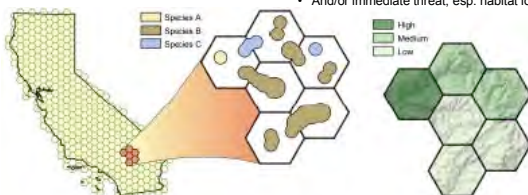


Geographical Information Systems



Geographical Information Systems

- **Rarity-weighted Richness Index (RWRI)**
"Index of irreplaceability"
 - For "species of special status"
 - Very limited distribution
 - Low population levels
 - And/or immediate threat, esp. habitat loss



1. State divided into equal hexagonal grid cells (250.4 mi² each)
2. How many cells does a species occupy? ↓ cells = ↑ rarity rank
3. RWRI for each cell = $\sum (\text{special species} \times \text{its rarity rank})$

Plant Diversity



Plant RWRI



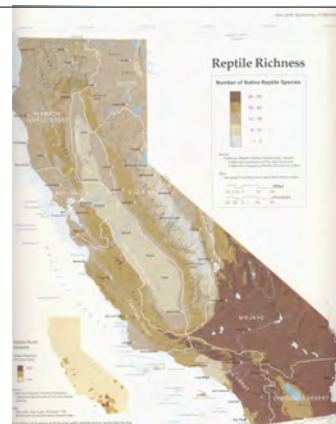
Mammal Diversity



Amphibian Diversity



Reptile Diversity



Bird Diversity

Summer Distribution
Winter Distribution



Human Population Density

