Southern California Oceanography in the MLPA South Coast Study Region

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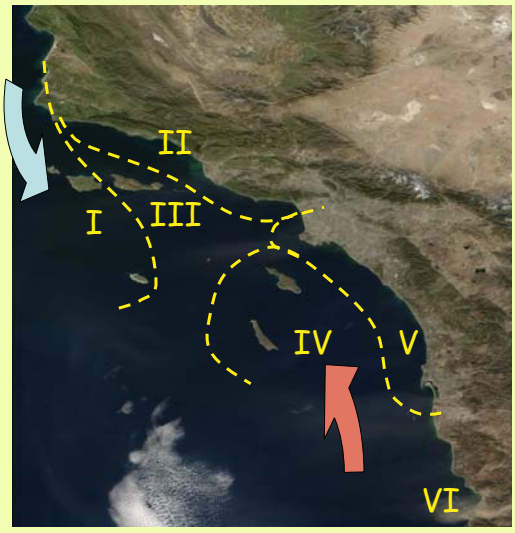
MLPA Master Plan Science Advisory Team

Presented January 13, 2009 in San Diego, CA

Developing an Oceanographic Perspective for MLPA in Southern CA

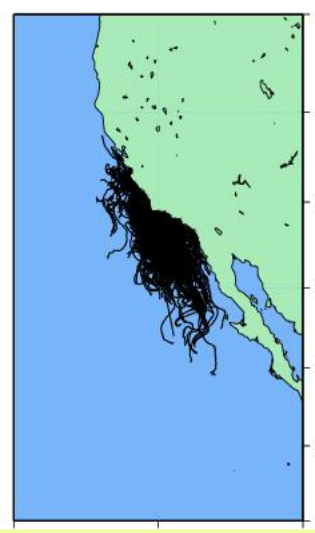
-- Currents & Connectivity

-- Water type & Habitat

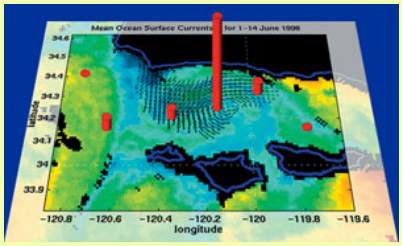


Southern California Oceanography, MLPA SCSR

Connectivity



- typical circulation pattern
- variability …
  - … predictable currents?
  - … "stochastic" dispersion?
- features



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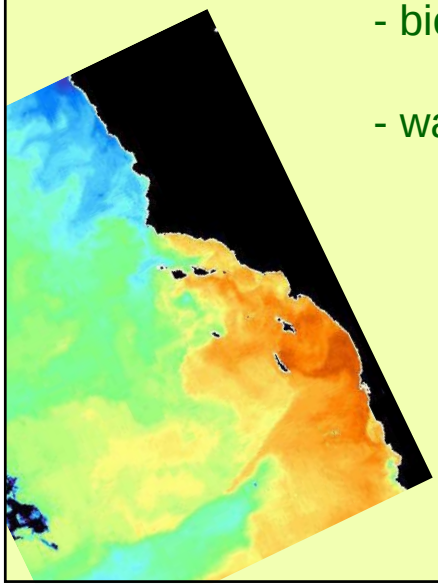
Habitat



- biogenic water properties (SST, chlorophyll)
- water quality, i.e., contaminants

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Habitat

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  (SST, chlorophyll)
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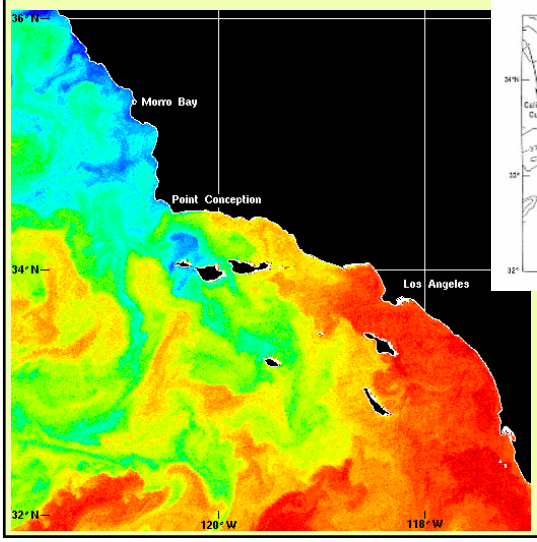
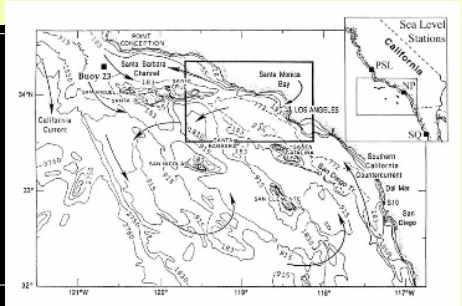
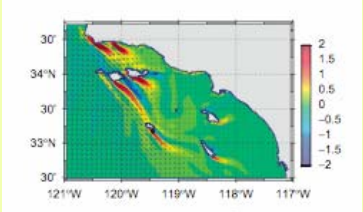
Large-scale circulation

schematic (Hickey 1992, 2003)







wind stress curl (Dong & McW 2007)

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Large-scale circulation

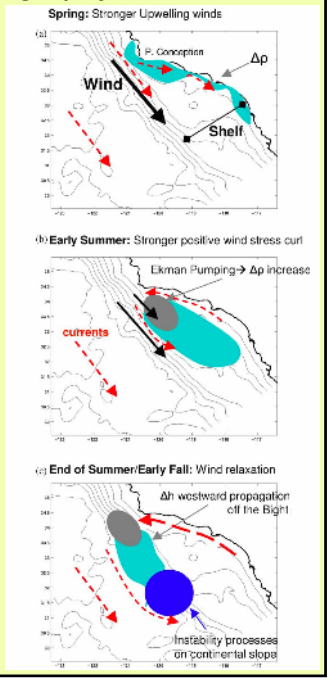
Seasonal evolution …

… spring: winds & upwelling

… summer: winds relax inshore,
curl & Ekman pumping,
SC Counter-current
Southern California Eddy

… fall: broadening recirculation
becomes unstable

seasonal dynamics (Di Lorenzo 2003)



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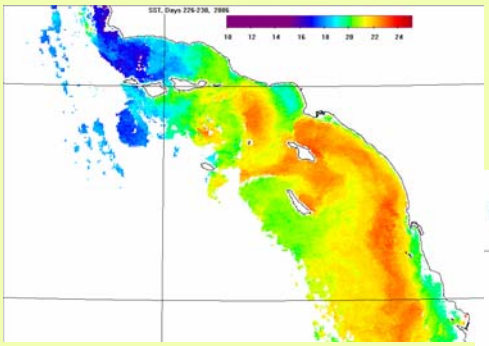
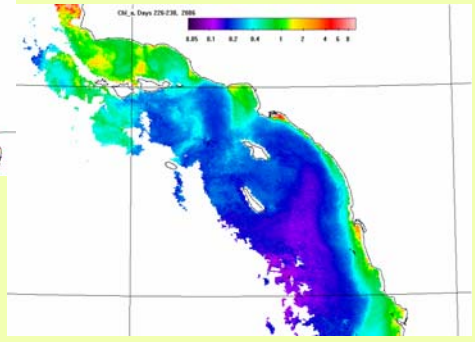
Multiple scales of patterns …



SBC, SMB, islands, upwelling, …



Merged MODIS Aqua and Terra products. (Aug 13 - 17, 2006). *Courtesy of M. Kahru and B.G. Mitchell, OPG Group, SIO*

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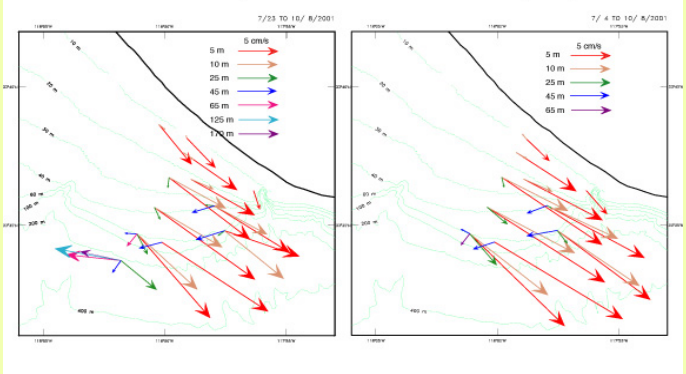
Shelf currents

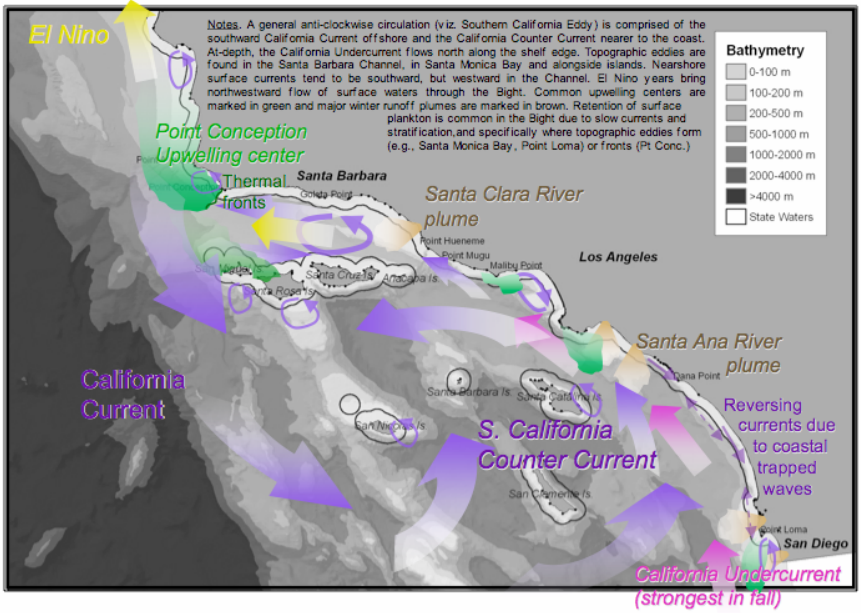
Southward currents over the shelf …

reversing at times (October - November?)



Huntington Beach (Noble et al 2004)

Circulation in the Southern California Bight



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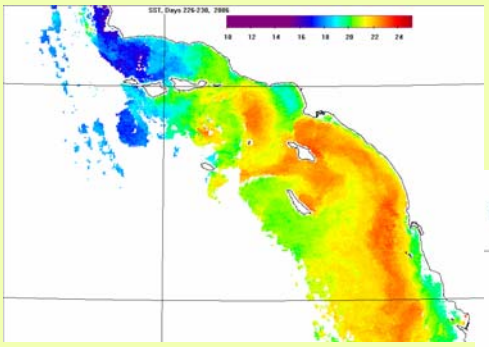
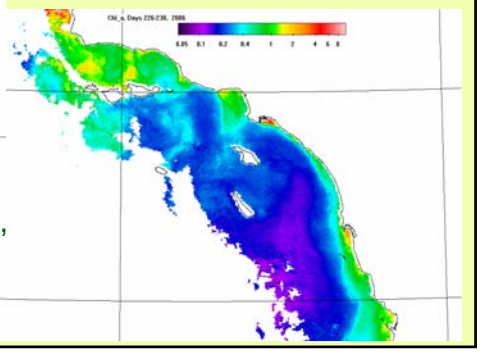
Upwelling



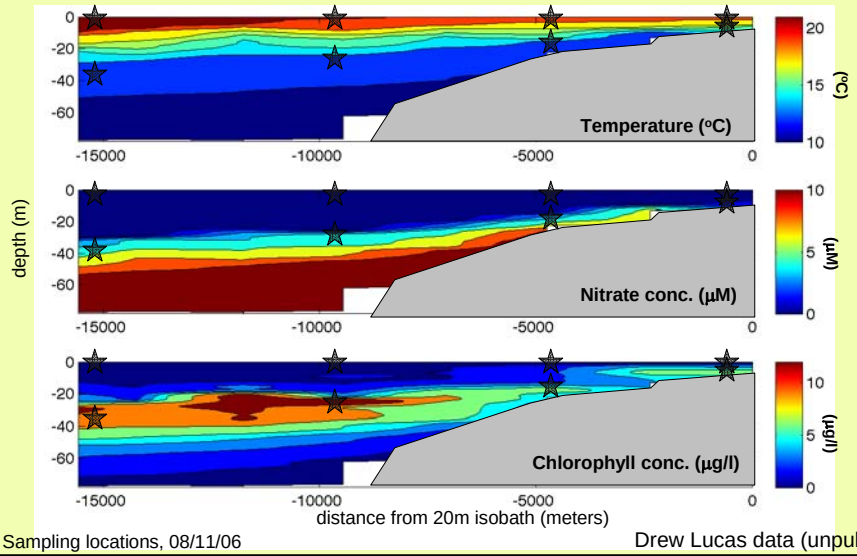
Shallow thermocline throughout Southern California Bight, breaks surface at specific times & places



Point Conception, Point Dume, Palos Verdes, Point Loma, south of border

Upwelling … Shallow thermocline with Chlorophyll max

Cross-shore transects, shelf break to the inner shelf :



★ Sampling locations, 08/11/06

Drew Lucas data (unpubl.)

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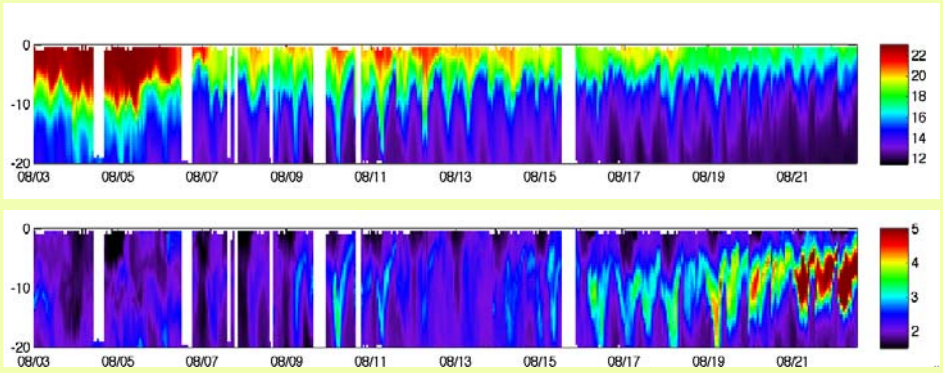
Internal Waves … and other HF motions

Temperature, fluorescence, (08/03 - 08/23/2006; 25 m WW):



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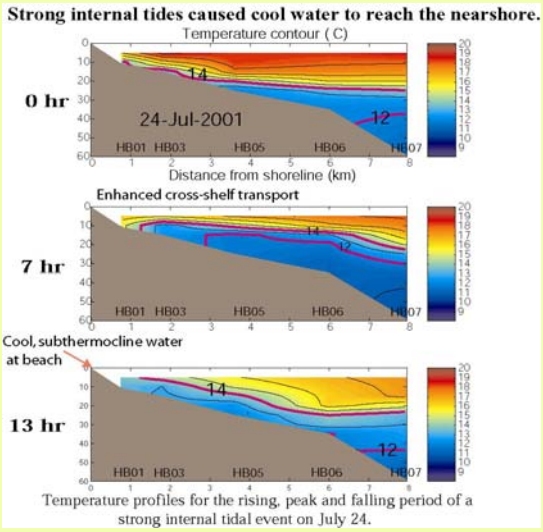

Temperature profiles for the rising, peak and falling period of a strong internal tidal event on July 24.

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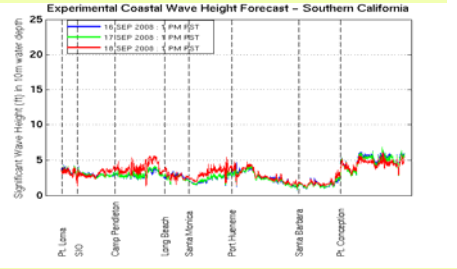
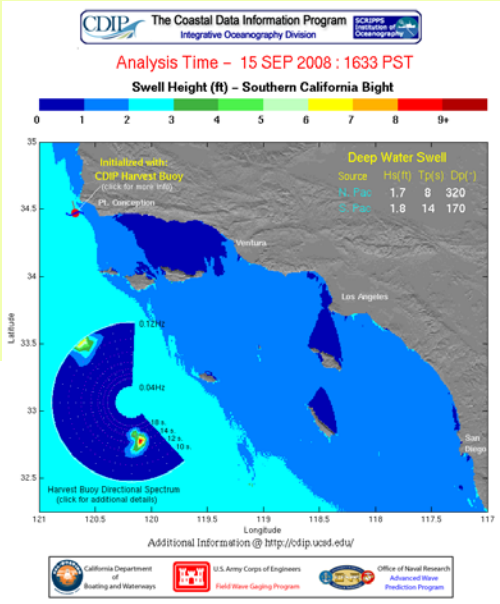
Waves





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River and tidal plumes

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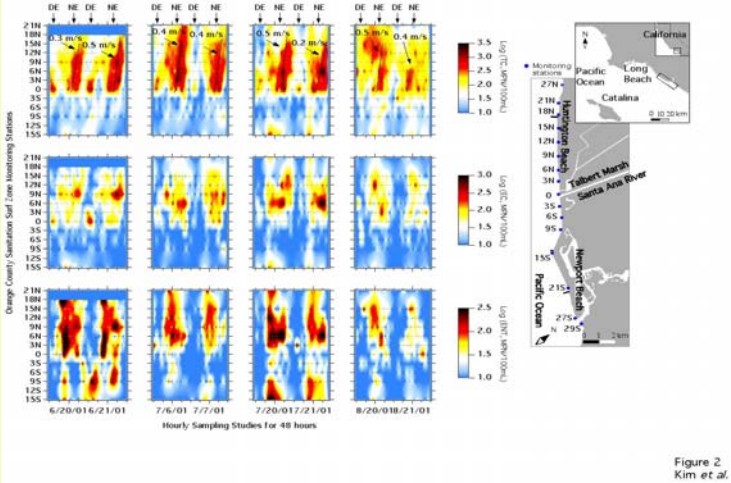

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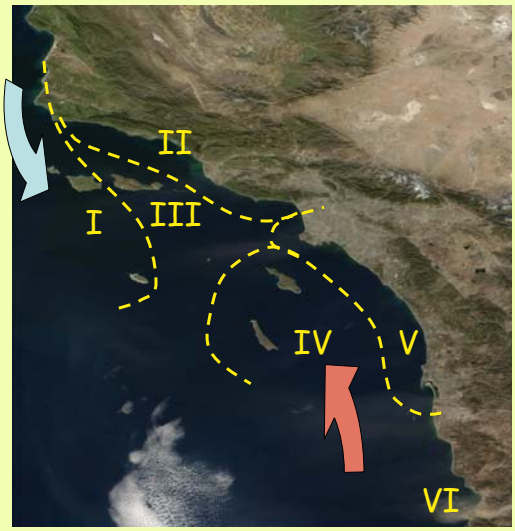
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