

# ABALONE AND URCHIN FISHERIES AT RISK?

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# Stressors

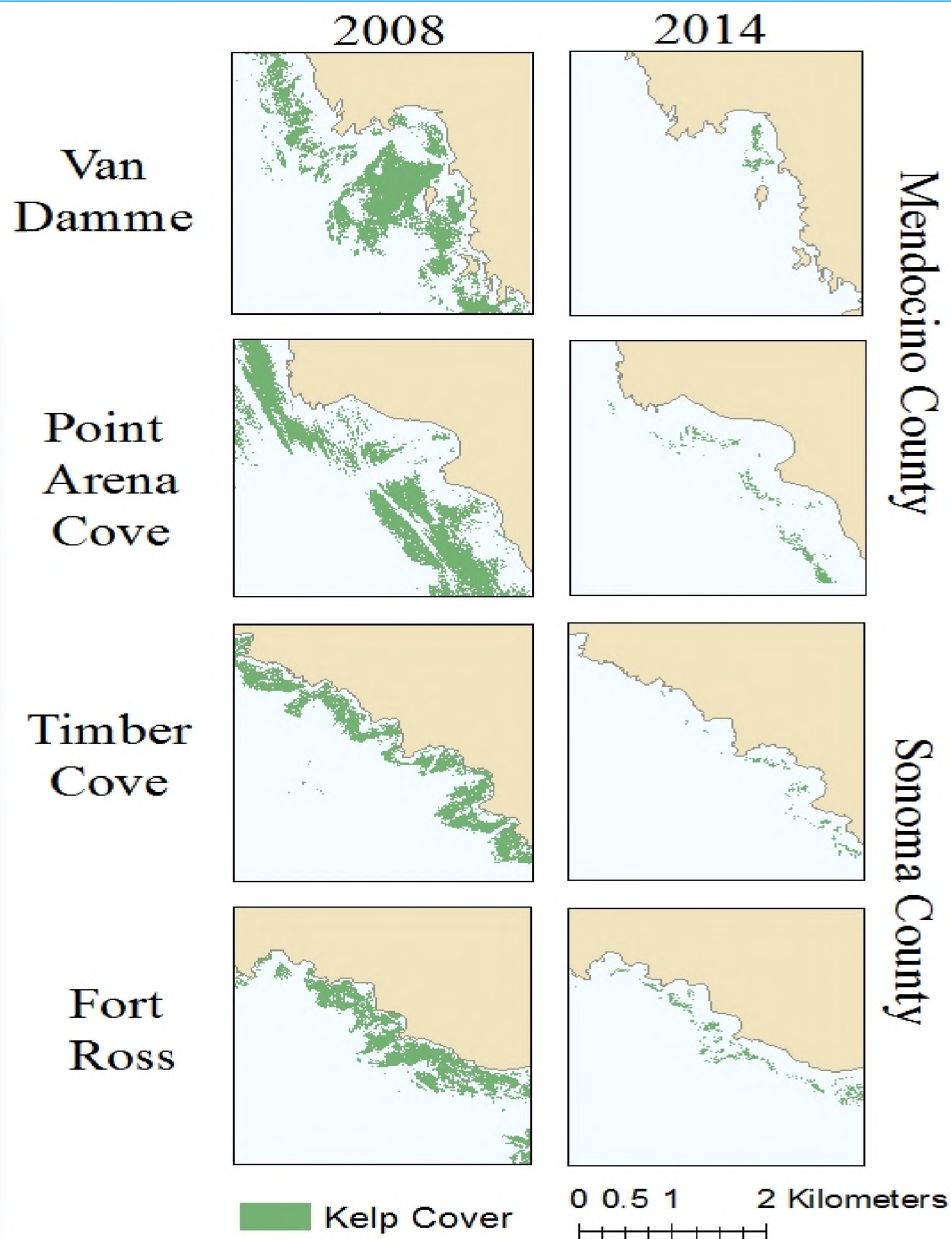
- \* KELP FOREST DECLINE
- \* HARMFUL ALGAL BLOOMS
- \* SEA STAR WASTING DISEASE
- \* PURPLE URCHIN EXPLOSION
- \* WARM WATER EVENTS



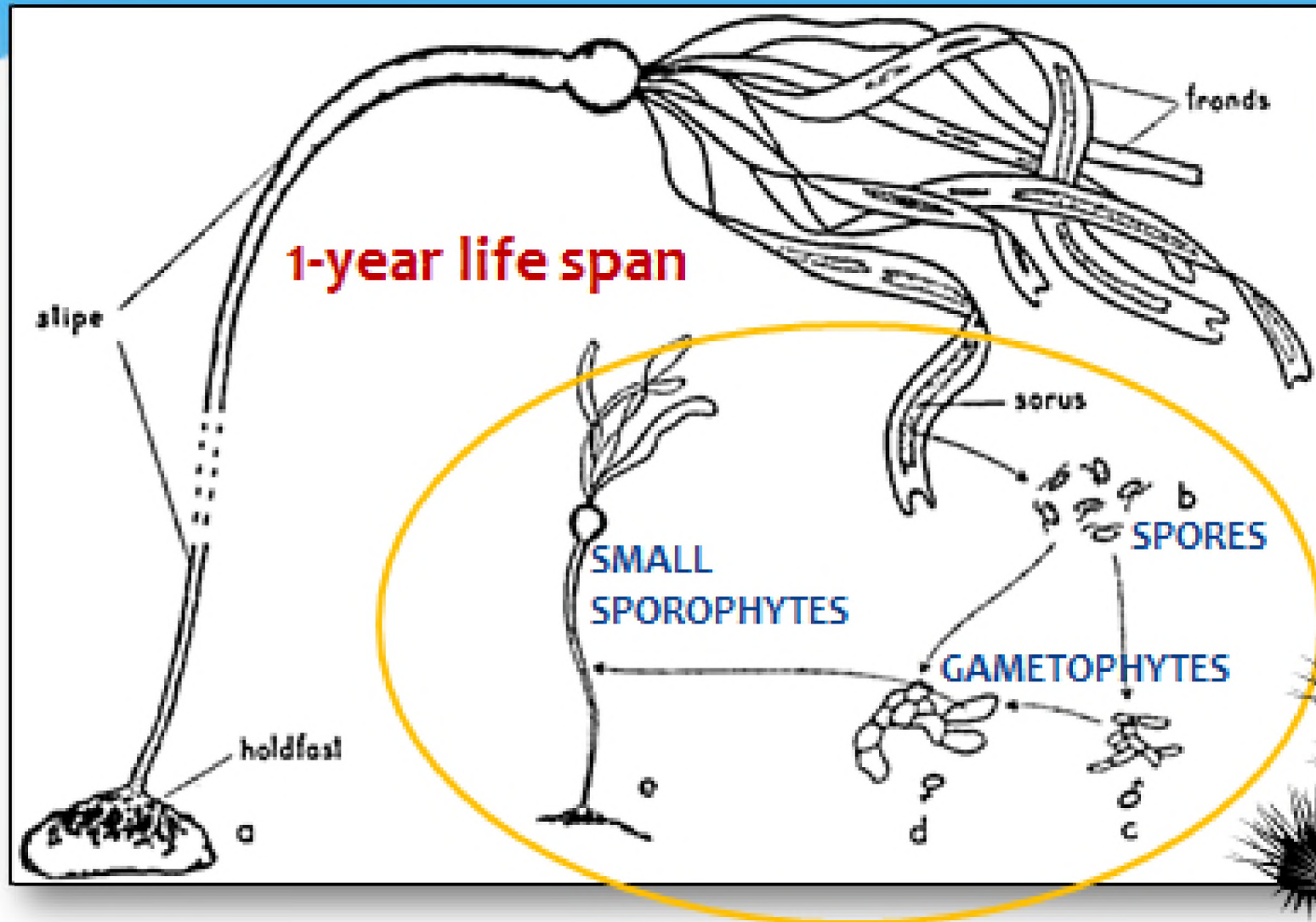
# Kelp Fly Over Data CDFW



Photo A. Wertz Fort Ross 2015



# Nereocystis Vulnerability





# Harmful Algal Bloom (Red Tide)

## Sonoma Co.



Photo:  
Nate Buck  
Fort Ross 2011

# Sea Star Wasting Disease North 2013



Photo A. Maguire



# Unprecedented Large-Scale Purple Sea Urchin Explosion in 2015



**> 60x historic  
densities in N.  
California**

Reports of high  
urchin numbers  
from Central  
California to  
Washington State

Photo A. Maguire

# Starving Conditions in Northern California (2014-2015)



A. Maguire



# Red Abalone Starving: Mendocino Oct. 2015



Photo K. Joe



Photo S. Holmes

# Abalone Shells

## Buckhorn Cove Mendocino, Co.

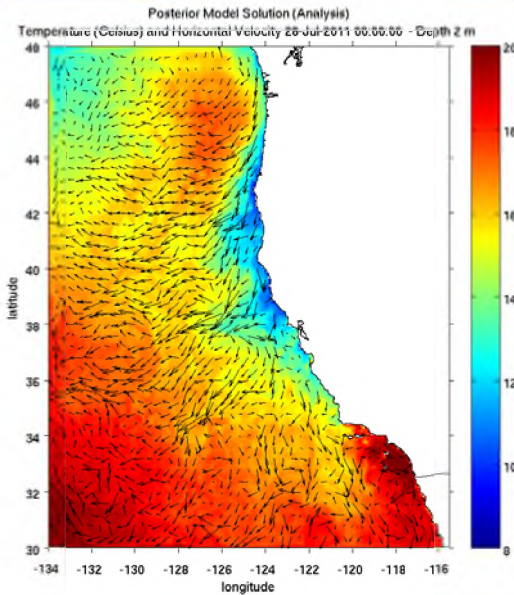


Photo: B. Brazill

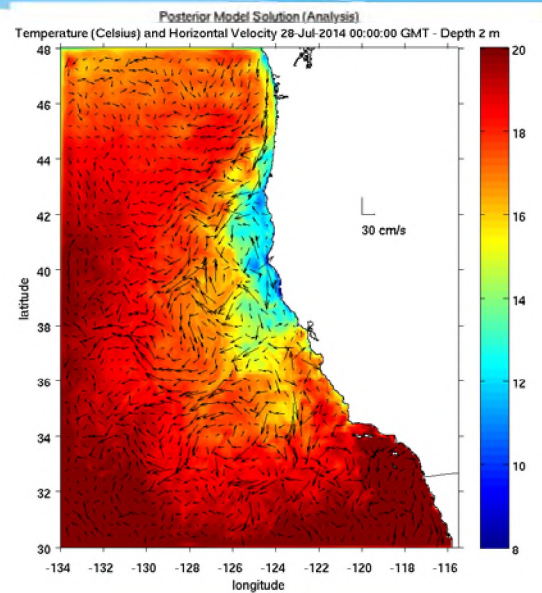


# Underlying Stressor

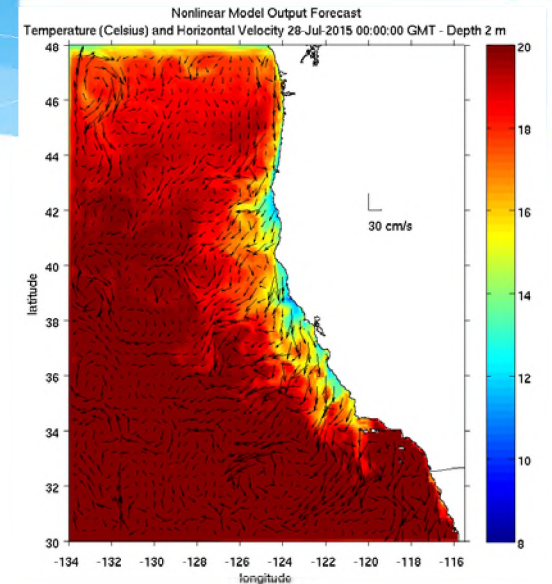
## Warm Water Conditions



- \* July 28, 2011
- \* Normal



- \* July 28, 2014
- \* “Warm Blob” Nick Bond
- \* Gulf Alaska



- \* July 28, 2015
- \* Strong El Niño

# We Need Your Help

- \* Research on northern kelp forests dynamics
- \* Research – abalone, urchins
- \* Essential Fisheries Information
- \* Ecosystem Based Management