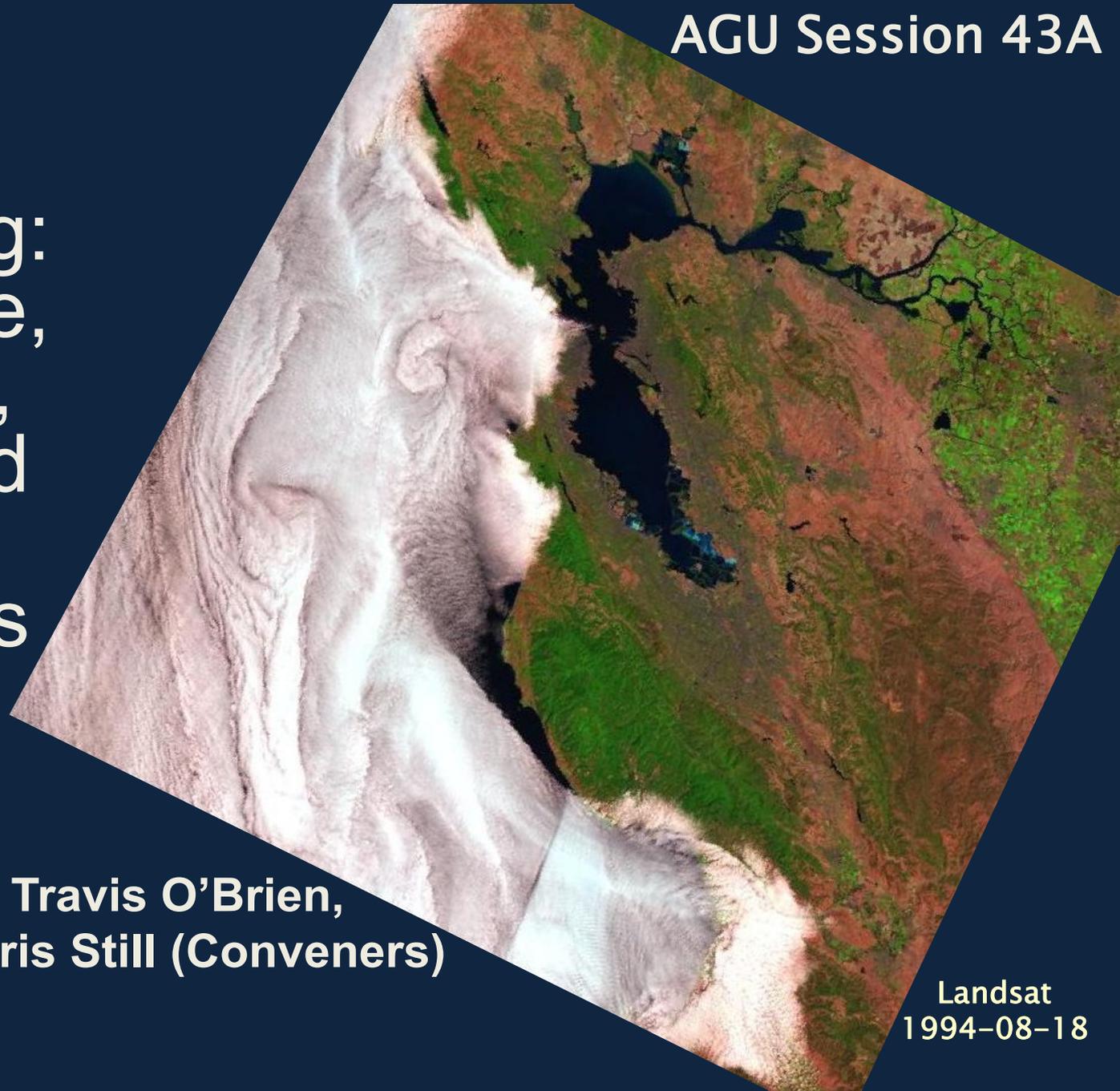


# Coastal Fog: Atmosphere, Biosphere, Ocean, and Land Interactions

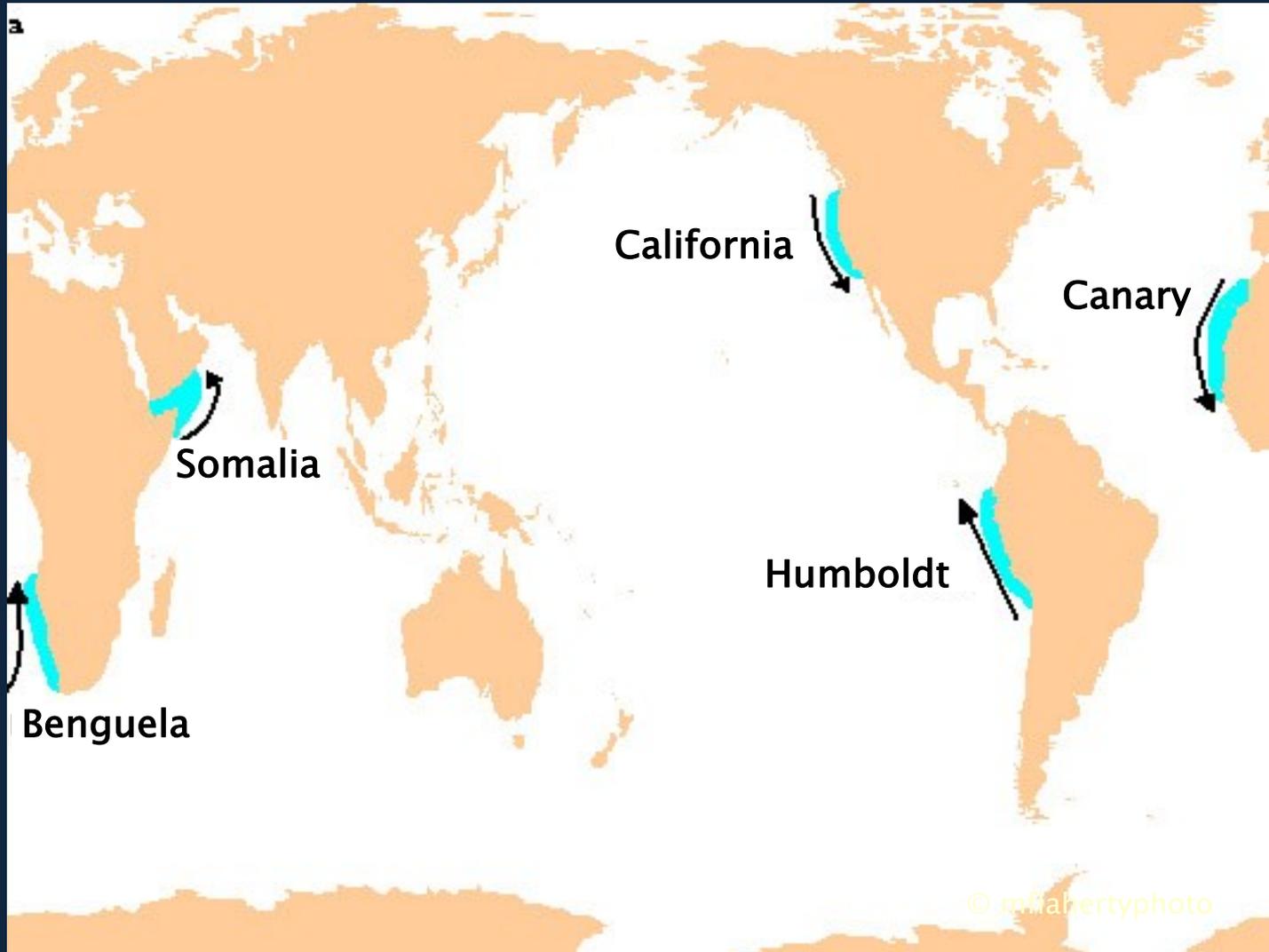


Landsat  
1994-08-18

**Alicia Torregrosa, Travis O'Brien,  
Ian Faloona, & Chris Still (Conveners)**

**December 6, 2012**

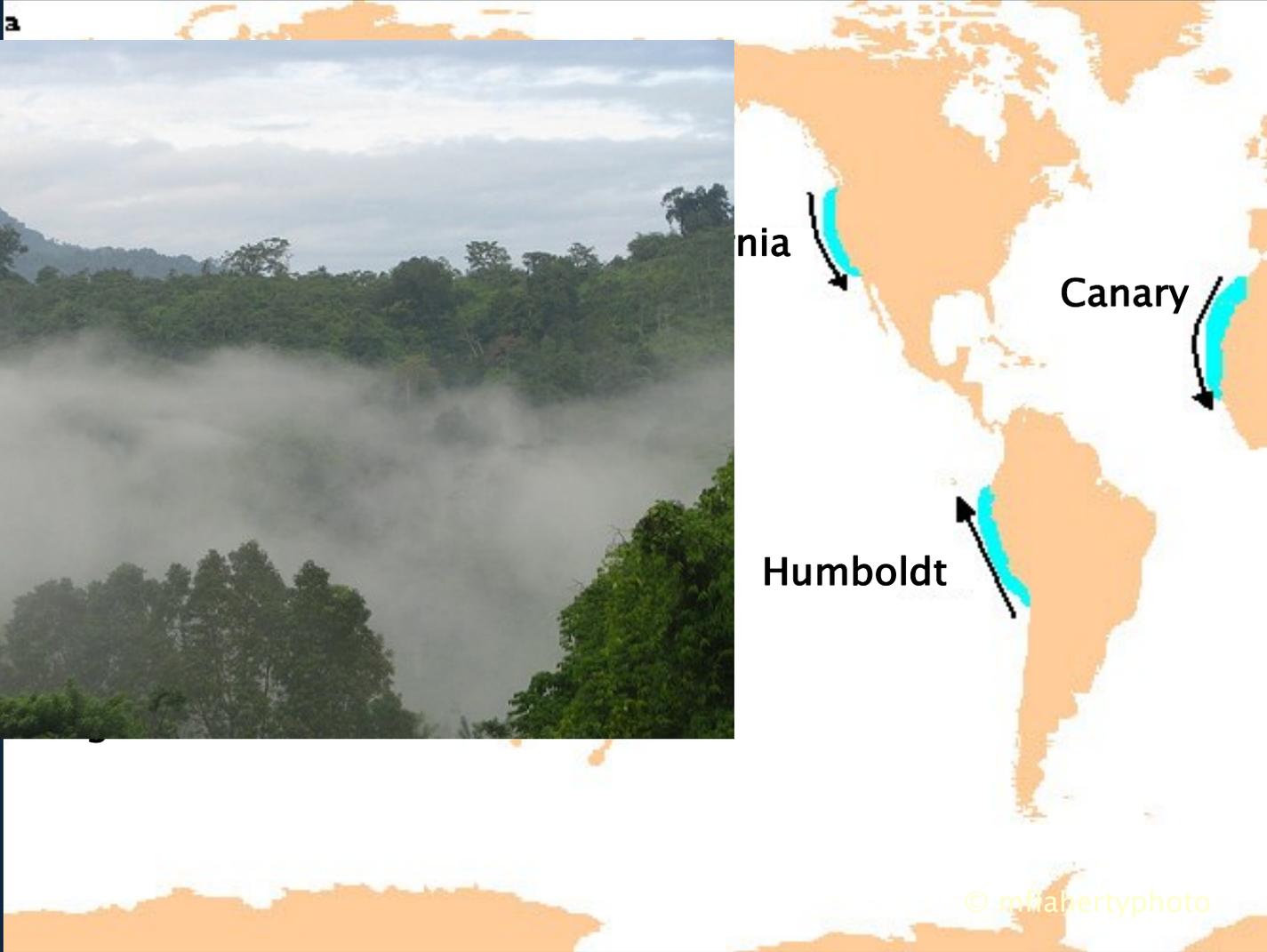
# Coastal Fog Zones–Upwelling



# Coastal Fog Zones–Upwelling



# Coastal Fog Zones–Upwelling



# Coastal Fog Zones–Upwelling



© cardboard box travel shop



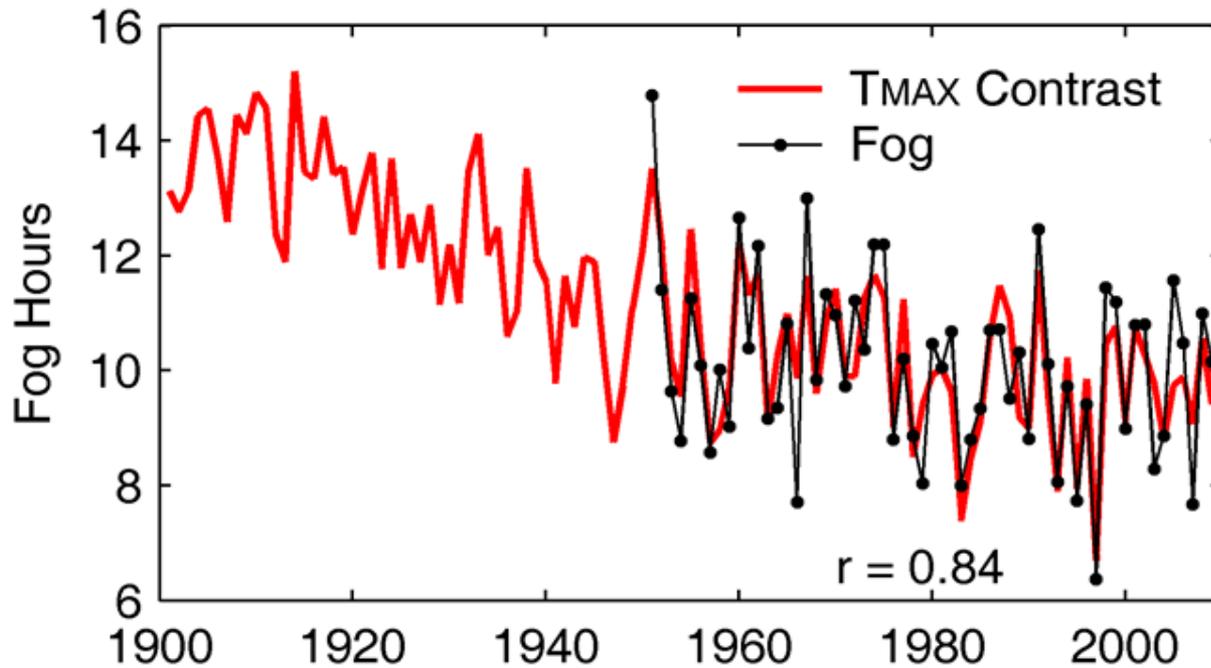
An aerial photograph of San Francisco, California, showing the city skyline and the Golden Gate Bridge. The scene is dominated by a thick layer of white fog or smog that obscures the lower parts of the buildings and the bridge's deck. The Golden Gate Bridge's iconic orange-red towers and suspension cables are visible, rising above the fog. In the background, the city skyline includes several prominent skyscrapers, with the Transamerica Pyramid being particularly noticeable. The sky is a pale, hazy blue, and distant mountains are visible on the horizon.

# Transportation Hazard

# Ecosystem Service

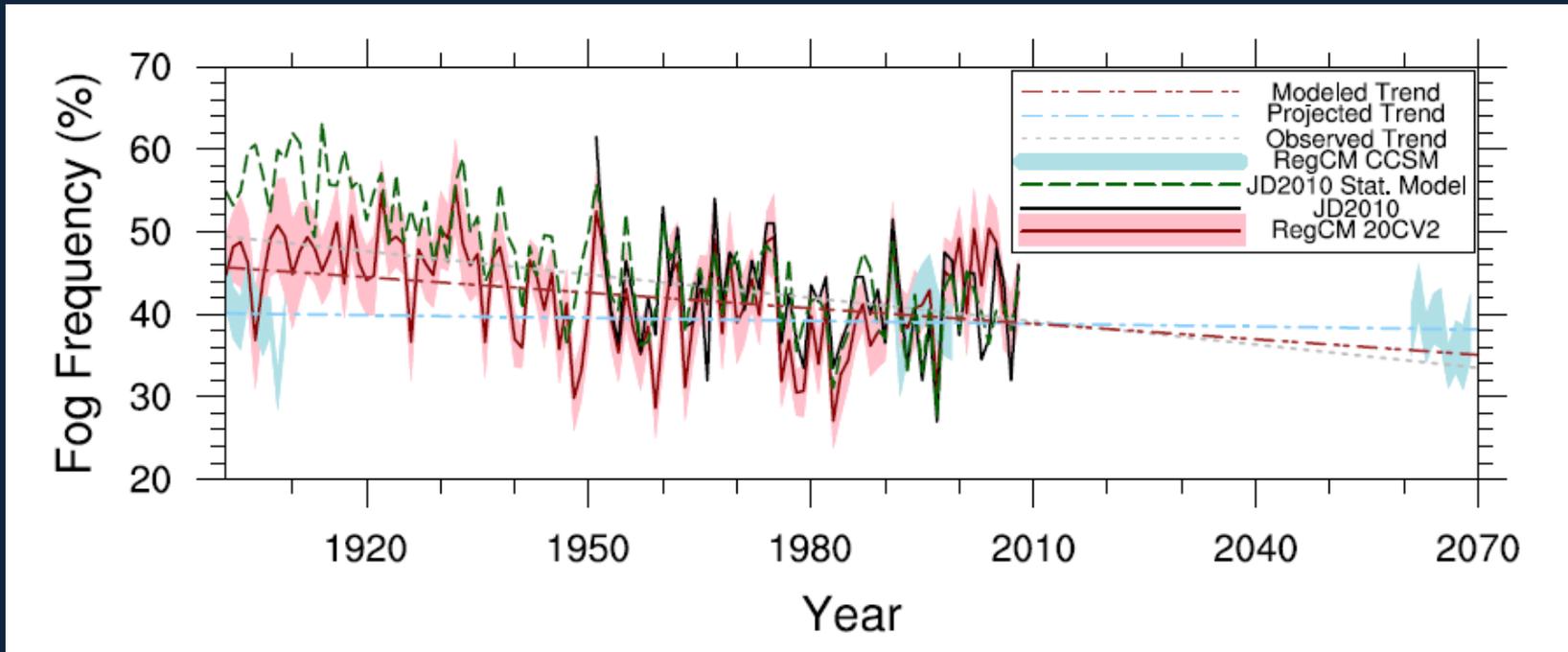


# $T_{\max}$ Inland-Coast Contrast 1901–2008



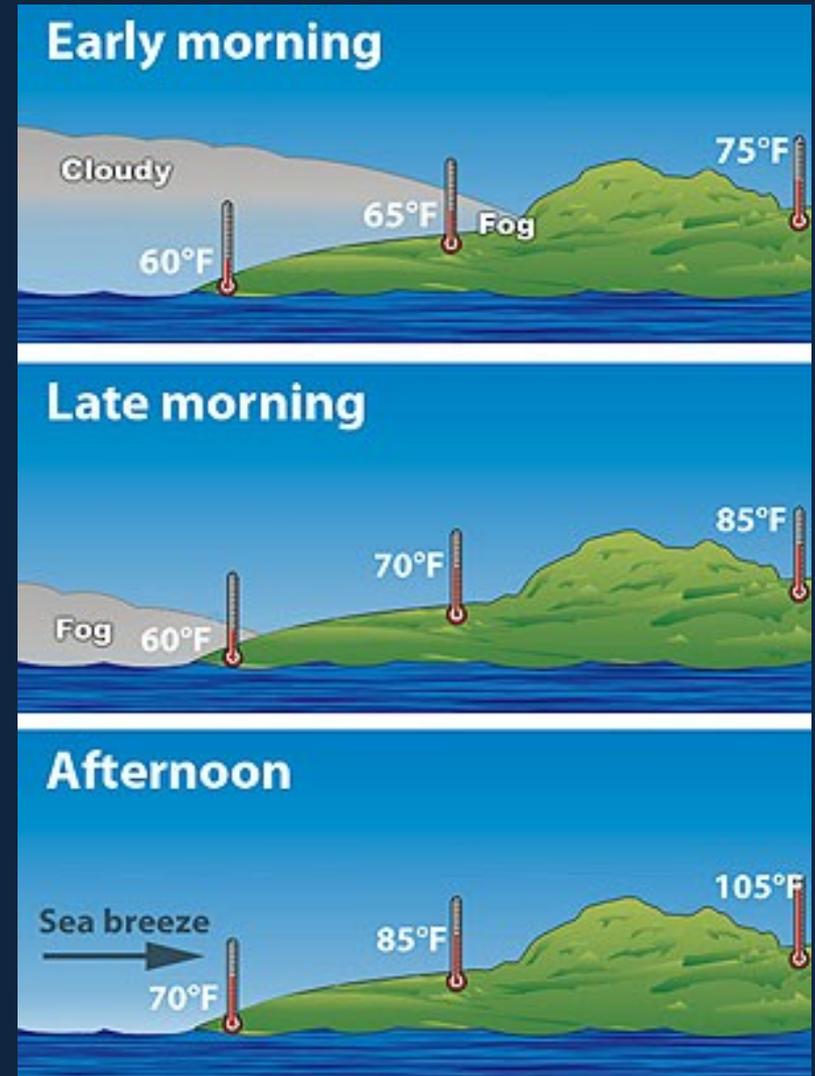
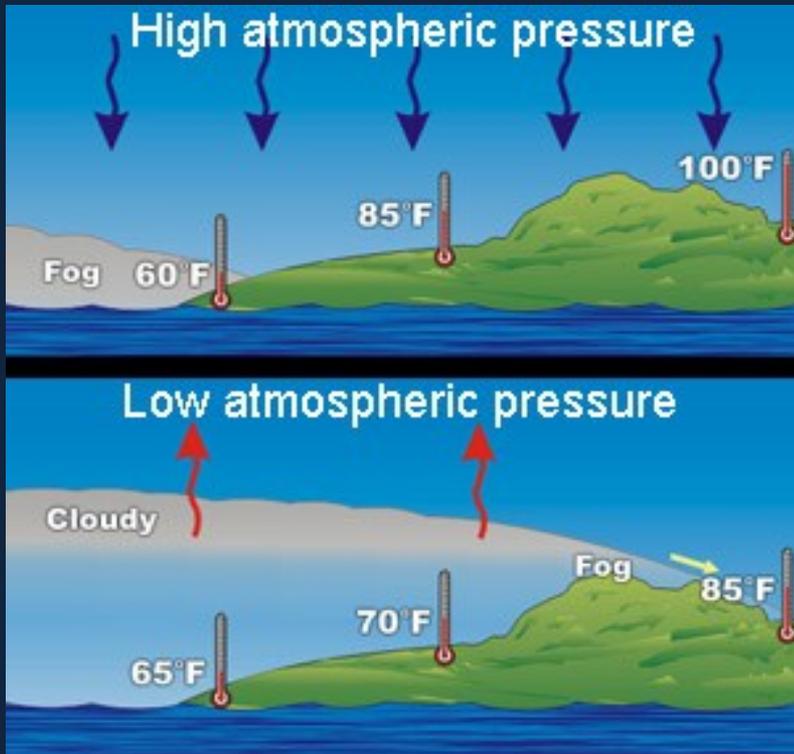
Johnstone & Dawson (PNAS 2010) suggest fog duration is ~3 hrs less (-33%) than in early 20<sup>th</sup> century

# RegCM-UW Fog Model



Output from Travis O'Brien's coupled model suggests long-term declines in fog driven by surface pressure that increased off-shore flow, drying the marine boundary layer and lifting the fog deck. Increasing SST would further reduce fog formation.

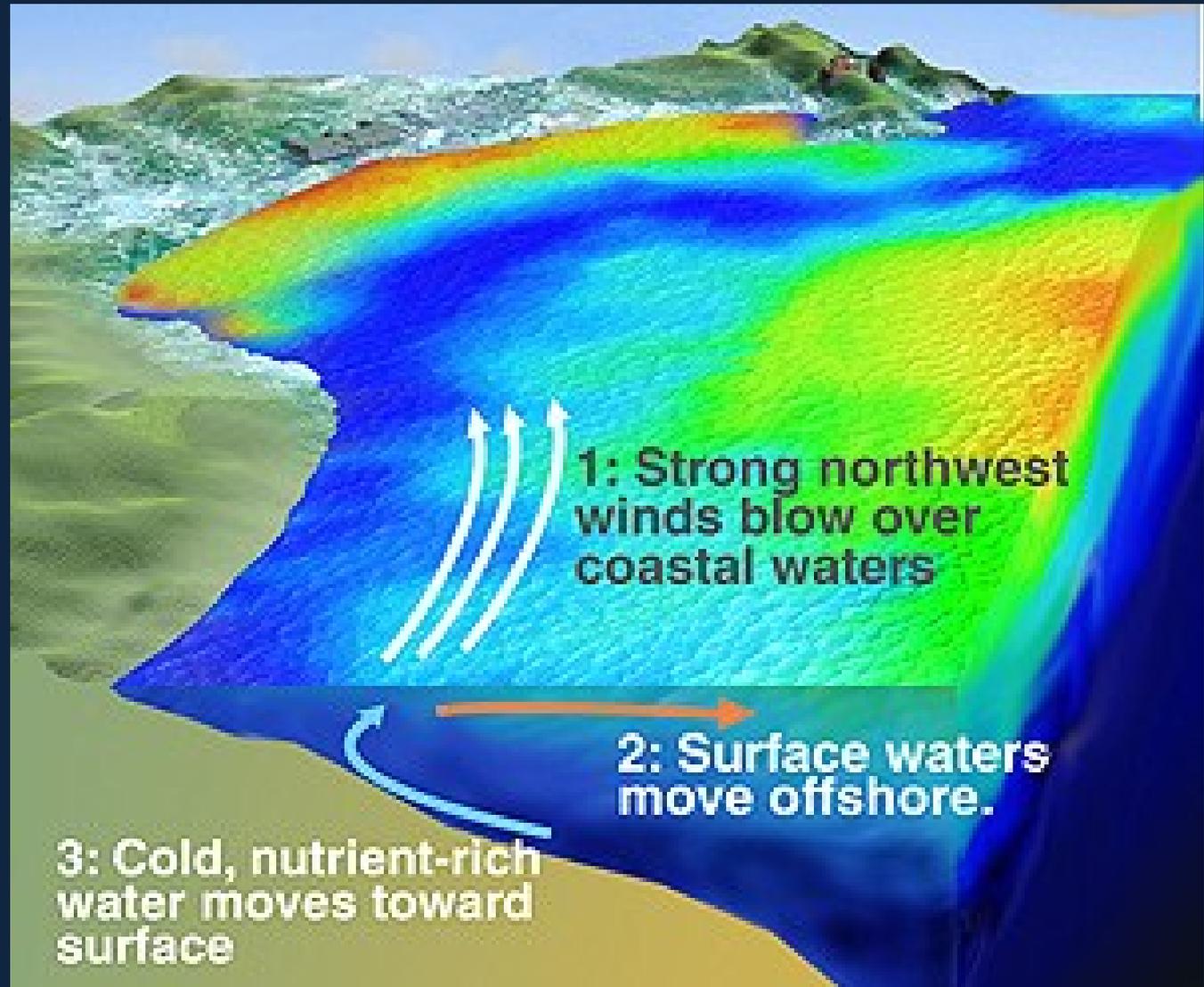
# Synoptic -- Regional



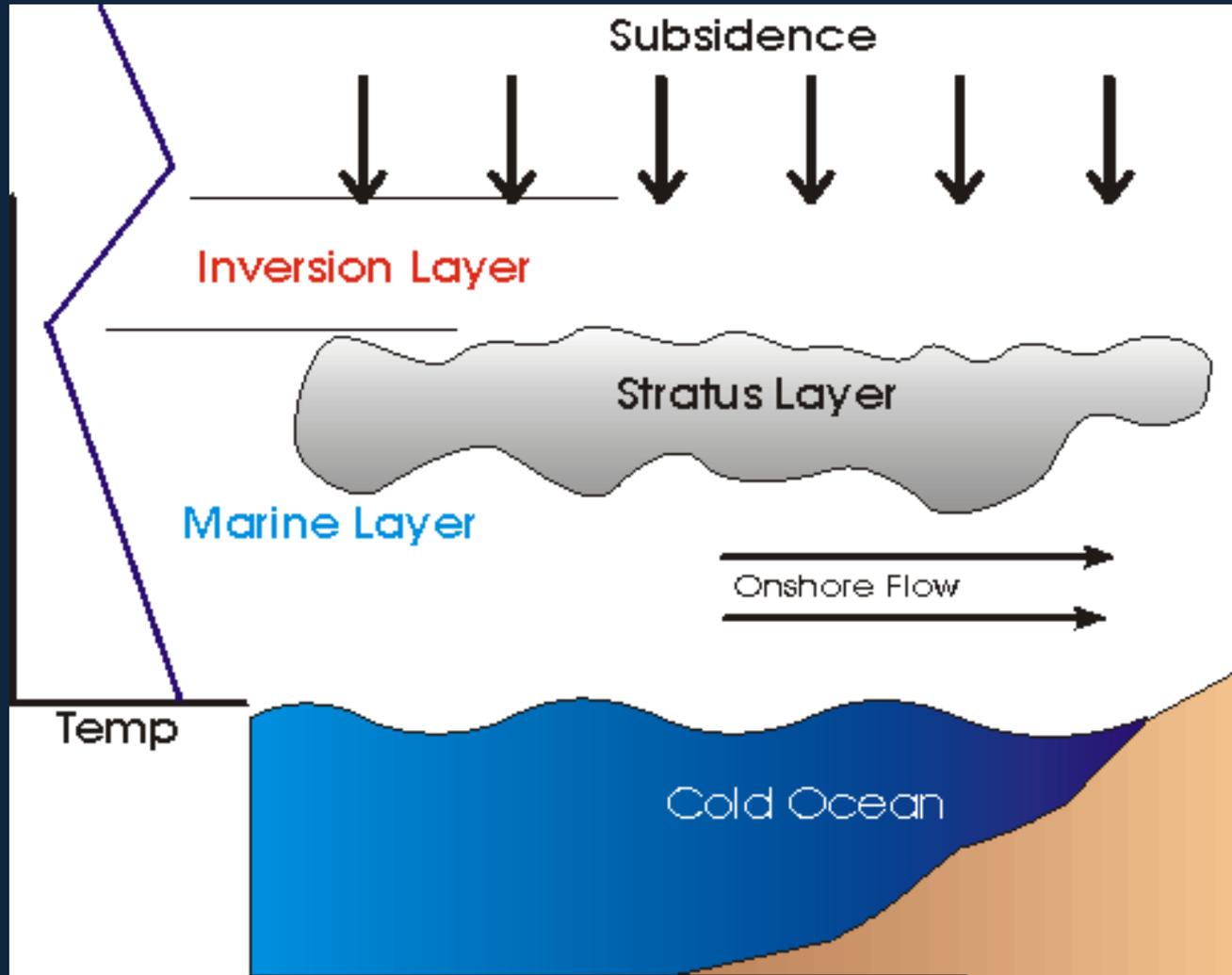
From <http://seasonsofthesea.com>

# Ocean Upwelling

Cold, upwelled water (blue) flows from Point Ano Nuevo down the coast and across the surface of Monterey Bay. Warmer water (orange and red) lies offshore and in the northeast corner of the bay. Vertical exaggeration ~ 100x (Source: David Fierstein / MBARI)



# Marine Layer capped by Subsidence Inversion in Summer



Prof Joel Michaelson,  
UCSB lecture notes

Liquid Water Content ?

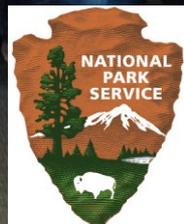
Heat Flux ?

Aerosol Transport  
& Composition ?



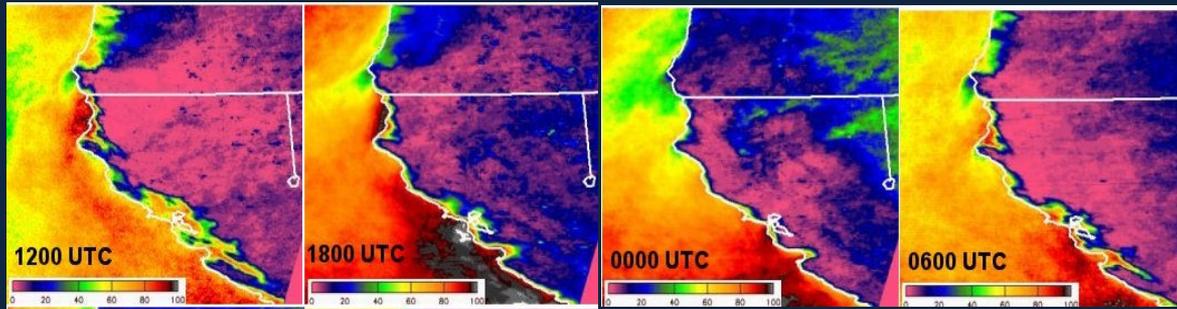
# Pacific Coastal Fog Workshop: Day 3

## April 5, 2012, USGS, Menlo Park, CA



# Fog Data for Site-based Study

GOES 1998 – 2009 compilation (Combs, CIRA)



Emily Burns, Save the Redwoods League



MaryAnn Madej, USGS Hydrologist

# Bodega -Pepperwood Transect Summer 2012 Pilot

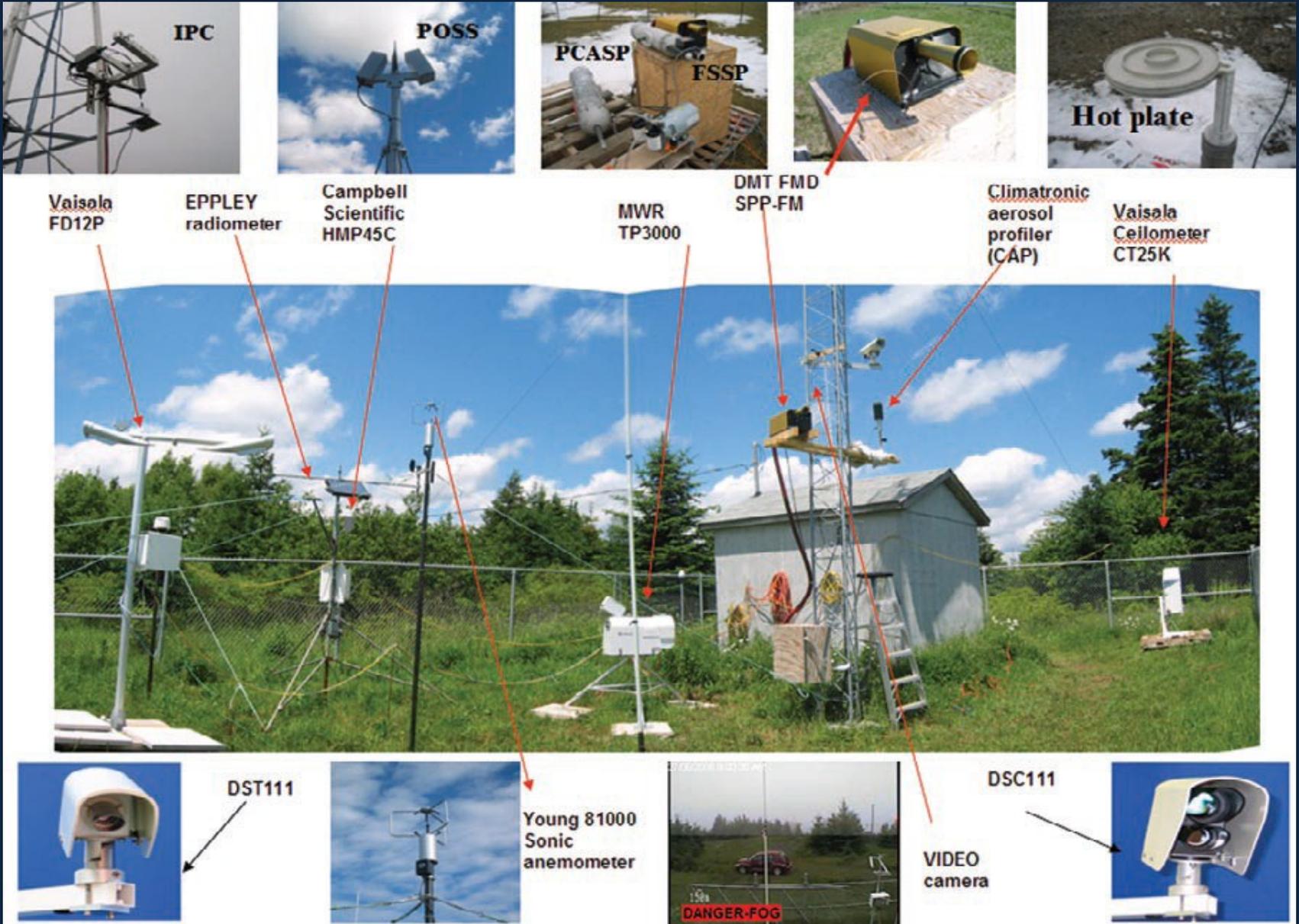
Bodega Marine Lab



Pepperwood Preserve



# Fog Super site



# Poster Session Today – A43B

0129. The Pacific Coast Fog Project: A Multi-disciplinary Effort to Provide Web-based Climate Products for Ecologists

*Alicia Torregrosa; Cynthia Combs; Gary P. Ellrod; Ian C. Faloona; Ismail Gultepe*

0130. Thirty Years of Cloud Cover Patterns from Satellite Data: Fog in California's Central Valley and Coast

*Eric Waller; Dennis D. Baldocchi*

0131. Characterization of inland fog zone in the Chilean Central Valley (35–38 S, 71W)

*Pamela I. Pizarro Andía; Alejandra Molina; Roberto F. Rondanelli*

0132. Exploring Meteorological and Climatic Conditions Driving California Coastal Marine Layer Clouds

*Rachel E. Schwartz; Lukas Nonnenmacher; Vladimir Kostylev; Sam F. Iacobellis; Alexander Gershunov*

0133. Integration of Visibility Sensors in NOAA PORTS® to aid in Decision Making for Safe Navigation

*Edward B. Roggenstein*

0134. An experimental study of summertime coastal fog and its inland penetration in Northern California

*Paulo Lucena Kreppel Paes; Paul Torres; Ian C. Faloona; Alicia Torregrosa; Ismail Gultepe*

0135. A case study on the impact of homogenizing monthly temperature series along coastal California

*Matthew J. Menne; Robert D. Bornstein; Amanuel T. Ghebregziabher; Jorge Gonzalez*

0136. Characterizing Spatial Patterns of Cloud Cover and Fog Inundation in the Northern Channel Islands Using Satellite Datasets and Comparison to Ground Measurements

*Bharat Rastogi; Christopher J. Still; Douglas T. Fischer; Sam F. Iacobellis; Michael P. Toomey; Burke Greer; Sara A. Baguskas; Park Williams; Kathryn McEachern*

0137. Monitoring coastal fog events using ground-based measurements and satellite imagery

*Cyrus Hiatt; Daniel Fernandez; Christopher S. Potter*

0138. Influence of the summer marine layer on patterns of chaparral diversity in west central California

*Michael C. Vasey; V. Thomas Parker; Michael E. Loik; Karen D. Holl; Seth Hiatt*

0139. Fog water collection measurements along the Central California Coast

*Daniel M. Fernandez; Cyrus Hiatt; Christopher S. Potter*

0140. Challenging Issues on fog forecast with a three-dimensional fog forecast model

*Matthieu Masbou*

0142. Relation Between Fog & Summer Stream Flow on the North Coast of California in Redwood National Park

*Koa Lavery*

0143. Development of the Fog Stability Index at Incheon International Airport.

*Yunyoung Song; Wonheung Kim; Seong S. Yum*

0144. Effects of synoptic-scale circulation pattern and local land surface condition on fog at Kushiro, northern Japan

*Shiori Sugimoto; Tomonori Sato; Kazuki Nakamura*