

WebCAT

The WebCam Application Testbed

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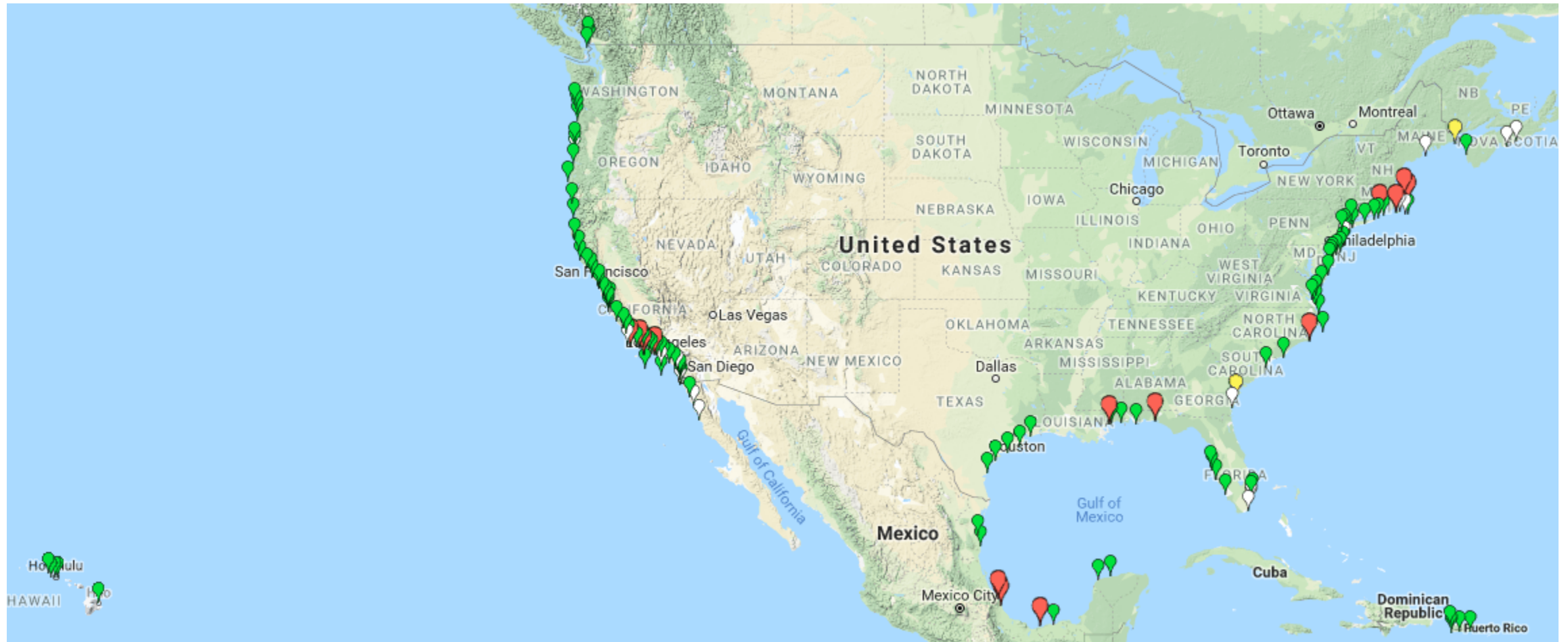
NOAA National Ocean Service

Why a coastal webcam network?

High Frequency Radar



HF Radar National Network



Coastal camera systems

Argus Station



Nearshore imagery - 1982



Surfline web camera network



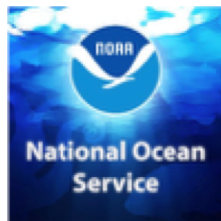
Webcam network vision

Develop a sustained operational webcam network with standardized imagery data acquisition and processing for a range of downstream applications

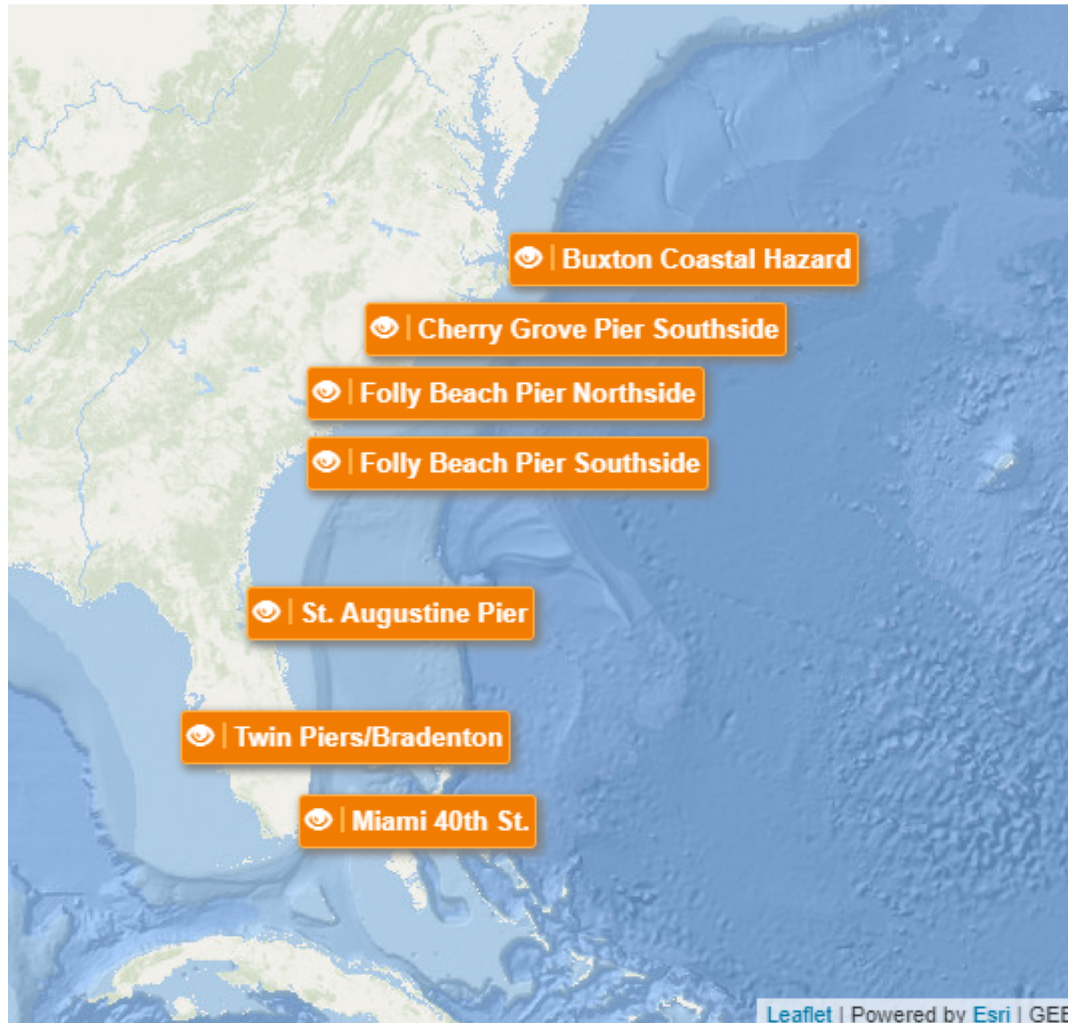
Standardization promotes innovation

The webcam testbed

- Initiated as a funded NOS stimulus project in late 2017
- Partnership involving SECOORA, NOS, NWS, Surflife, USGS, Axiom, Academia
- 75k initial funds included everything camera related, data management, workshop
- Proposed five cams in the southeast, but ended up with seven!
- Most cams have been in since at least February, 2018



Webcat camera locations



Camera Location	Stationary or Panning	Elevation (m)	Purpose
Buxton, NC	S	10	Runup
North Myrtle Beach, SC	S	15	Beach use and water quality; rip currents
Folly Beach, SC (north and south)	S (north) P (south)	15 15	General monitoring
St. Augustine, FL	P	10	Whale monitoring
Miami, FL	S	40	Rip currents; runup
Bradenton, FL	S	5	Rip currents

Camera installations



Data accessibility

WebCAT – Live Cameras and Historic Feeds

— Register for the workshop *"Exploring Applications, Opportunities and Challenges to using Webcams for Environmental Monitoring Workshop"* hosted November 14-15, 2018 in Charleston, SC.

Web cameras are transforming how environmental monitoring is conducted. Video data is being used for applications related to transportation and commerce, preparedness and risk reduction, and stewardship of coastal resources.

The NOAA NOS Web Camera Applications Testbed (WebCAT) is a short-term project that is installing web cameras in five locations for various purposes – counting right whales, spotting rip currents, validating wave run up models, understanding human use of natural resources and more. This unique project is a public-private partnership leveraging the expertise and capabilities of private, nonprofit and public sectors.

The screenshot displays the WebCAT web application interface. On the left, a map of Florida shows the locations of seven web cameras, each marked with an orange icon and a label: Buxton Co, Cherry Grove Pier So, Folly Beach Pier Northside, Folly Beach Pier Southside, St. Augustine Pier, Twin Piers/Bradenton, and Miami 40th St. The map includes zoom controls (+/-) and a scale bar. The main area on the right features a large video player showing a live feed from the Miami 40th St. camera. The video player has a play button, a progress bar (0:02 / 10:03), and a volume icon. Below the video player, there is a timeline of historic feeds with buttons for 'More Times', '11:00', '11:10', '11:20', '11:30', '11:40', and '11:50'. At the bottom, there are buttons for 'Live' and 'Archive', a date selector set to '10/31/2018', and navigation arrows.

What is coastal imagery data used for?

- Coastal Morphological change
- Hydrodynamics
- Human Impact on coastal resources
- Ecology, environmental and water quality
- Recreation and weather observations

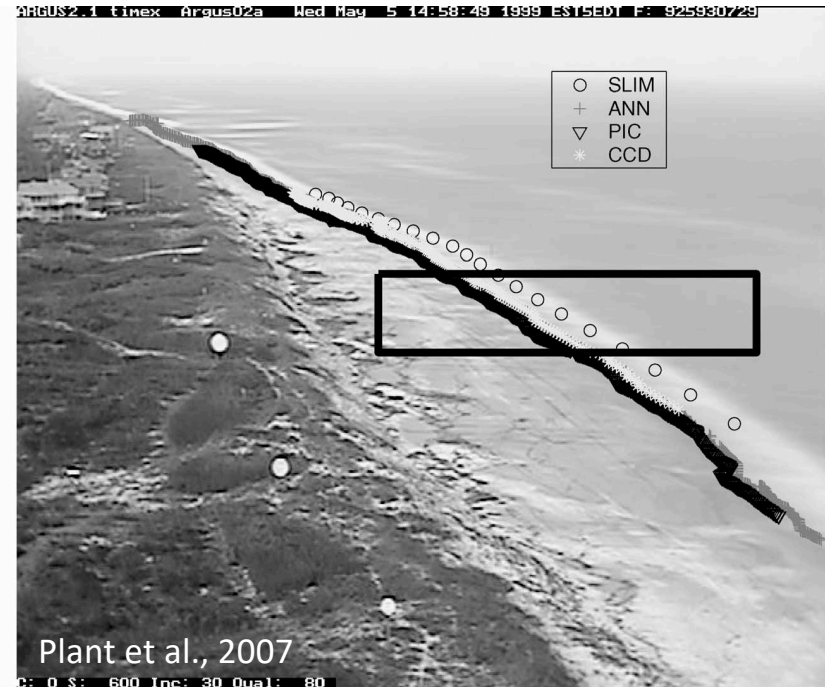
Coastal Morphological change

Sandbar morphology

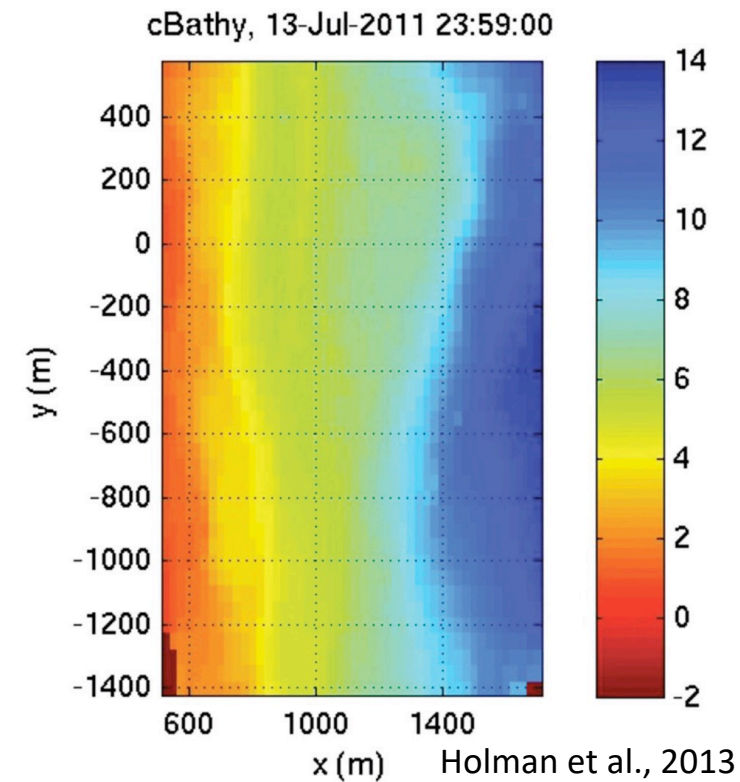


Lippman and Holman, 1989

Shoreline position



Nearshore bathymetry



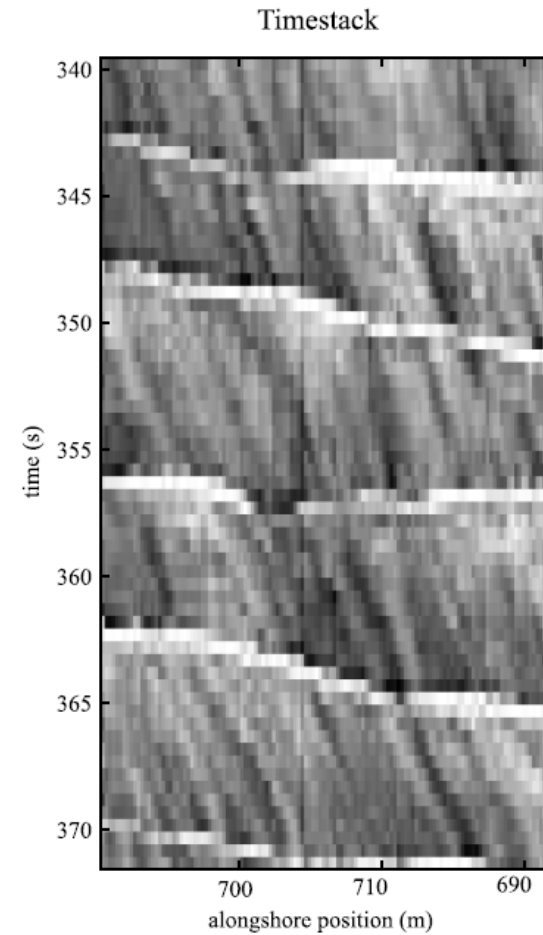
Holman et al., 2013

Hydrodynamics

Rip current identification

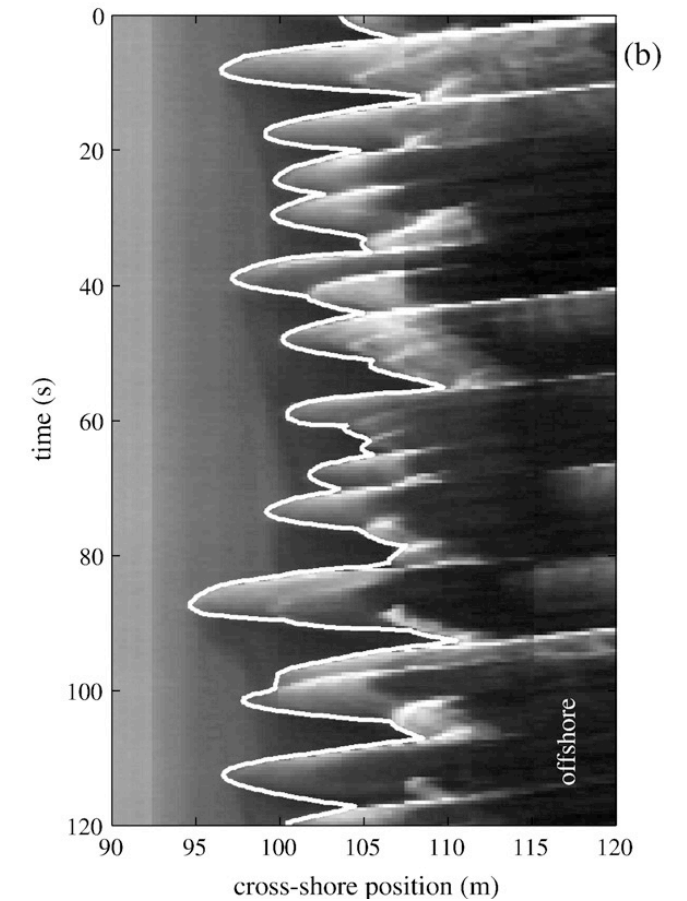


Longshore current flow



Chickadel et al., 2003

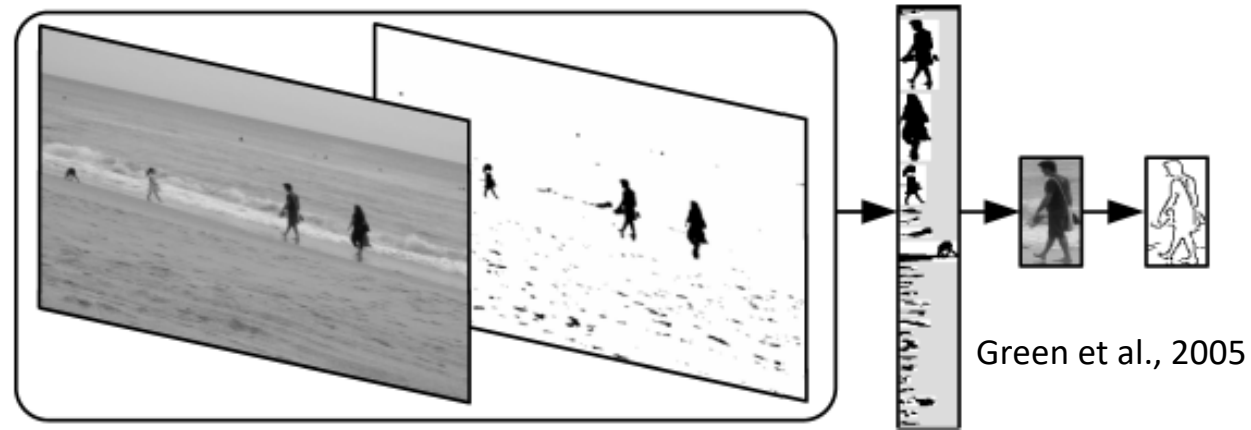
Wave runup



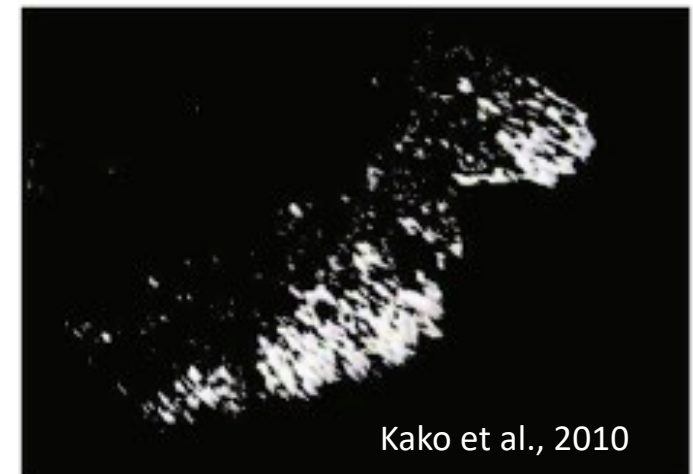
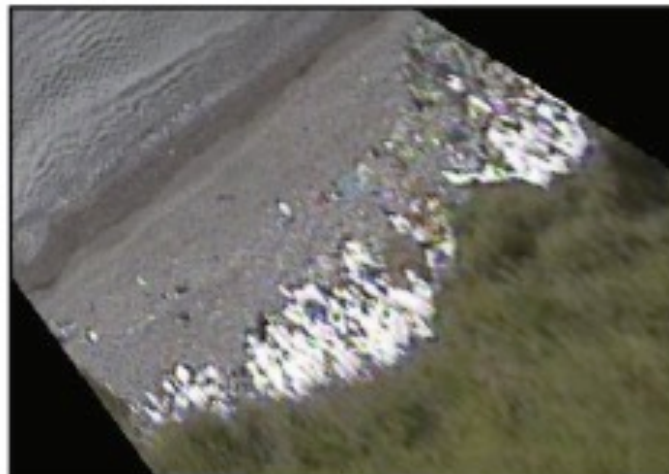
Stockdon et al., 2006

Human Impact on coastal resources

Automated person counting

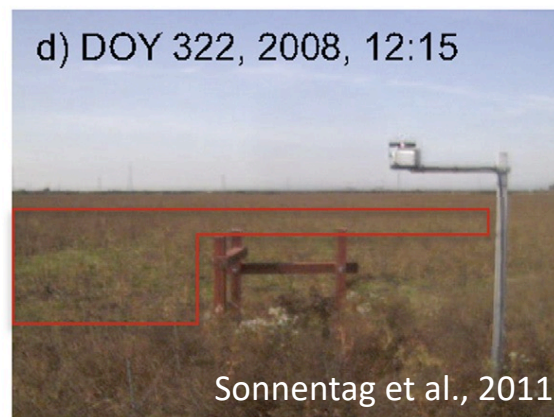
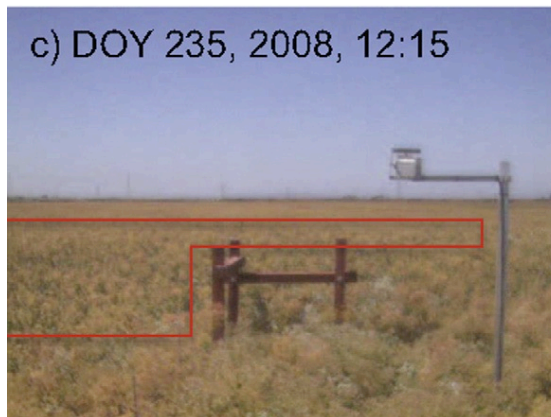
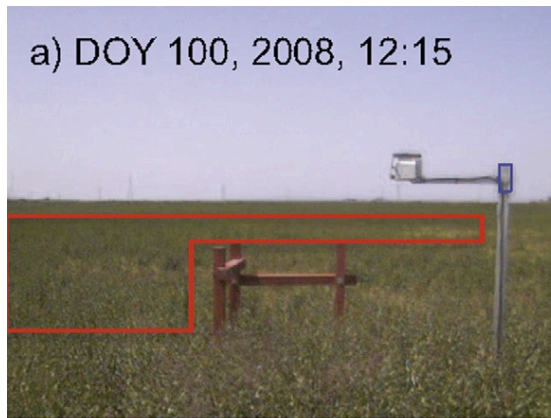


Tracking marine debris

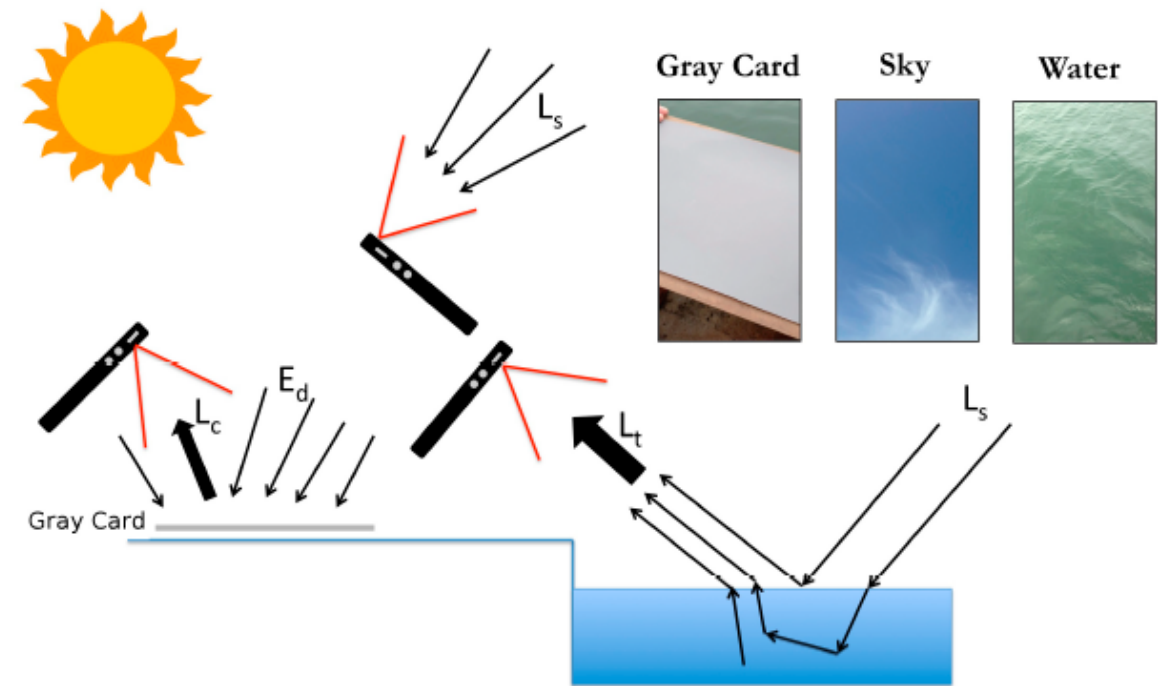


Ecology, environment and water quality

Ecological monitoring



Water quality



Leeuw and Boss, 2018

What is the future for WebCat?

- How do we sustain and increase observations?
- How to do we develop and ensure standardized data collection, processing, metadata, QC, access?
- Can we continue to progress image analysis and applications?