

PROJECT INFORMATION FORM

Project Title	Using Time Lapse Cameras to Track Shoreline Change Due to Sea Level Rise
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Funding Source(s) and Amounts Provided (by each agency and organization)	USDOT- \$113,465.68
Total Project Cost	\$113,465.68
Agency ID or Contract Number	UCD-DOT-202
Start and End dates	10/1/2015 – 1/31/17
Brief Description of Research Project	<p>Shoreline habitats and infrastructure are currently being affected by sea level rise (SLR) and as global temperatures continue to rise, will continue to get worse for millennia. Governments' and individuals' decisions to adapt to SLR could have profound consequences for adjacent ecosystems, transportation systems, and urban settings. The cost for this adaptation will also increase over time. Natural systems often attenuate impacts of SLR and storms, providing a free and often unrecognized and under-appreciated protective service for shoreline infrastructures. There is no current information available to shoreline agencies on fine-scale and near-term/current changes in shoreline in response to SLR. This project describes a method to monitor shoreline and infrastructure changes in response to SLR using a network of time-lapse cameras. The researchers found that the method was sensitive to vertical changes in sea level of <1 cm, roughly equivalent to 1-2 years of SLR under the A1 scenario (i.e., high emissions/business-as-usual). SLR of >20 cm has occurred in the San Francisco Bay and other US coastal areas and is likely to rise by another 30-45 cm by mid-century. This rapid degree of rise means that it is imperative to include planning for infrastructural modifications in current regional and corridor plans. Accurate and timely information about the actual extent of SLR impacts to shorelines will be critical during highway adaptation. The method described is feasible for near-term (1 to 10 years) to long-term application, and can be used for measuring fine-resolution shoreline changes (e.g., degree of inundation, plant cover, and geomorphology) in response to SLR and associated wave action inundation of marshes and infrastructure. The researchers demonstrated the method with networks of cameras in two coastal states (CA and GA), using web-informatics and services to organize photographs that could be combined with related external data (e.g., gauged water levels, moon phases) to create an information mashup. The report discusses how outputs from these techniques could be used to validate models of SLR threats to coastal systems and inform transportation and regulatory decision-making. Finally, they discuss next steps, including using two other, complementary methods for monitoring shorelines: drone-based terrain-mapping and historical, opportunistic and satellite photographs.</p>

Implementation of Research Outcomes (or why not implemented) (Attach any photos)	
Impacts/ Benefits of Implementation (actual, not anticipated)	
Web Links <ul style="list-style-type: none">• Reports• Project website	https://ncst.ucdavis.edu/project/using-time-lapse-cameras-to-track-shoreline-change-due-to-sea-level-rise/