Dunes Climate Ready Grant Update

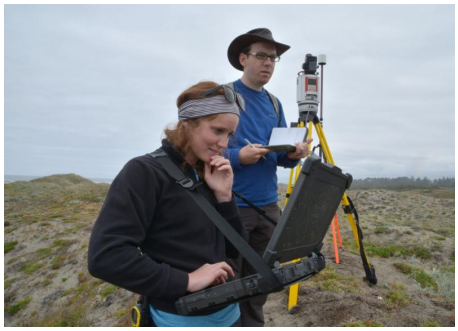
August 2015-October 2015

DUNES CLIMATE READY GRANT QUARTERLY UPDATE

The Dunes Climate Ready Grant (Coastal Vulnerability and Adaptation Study) is funded by the State Coastal Conservancy's Climate Ready Program. It is designed to further understanding of how climate change will impact Humboldt's coastal dunes and test the effectiveness of different adaptation strategies. As part of education and outreach component of the grant, quarterly email updates are sent to email subscribers keeping them up to date on the progress of the grant.

August-October 2015 Update

Regional Monitoring Network



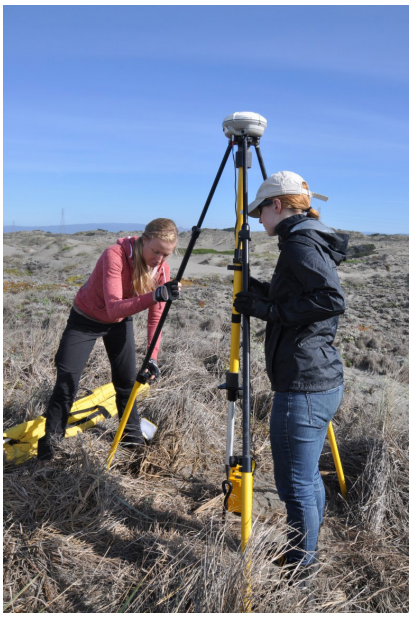
Alana Radar and Mike Grilliot from University of Victoria operate the Terrestrial LiDAR Scanner in the native vegetation area of the North Spit Dune Adaptation site.

In the first quarter, the scientific team, under the leadership of co-Principal Investigators Andrea Pickart (USFWS) and Ian Walker (University of Victoria), focused on establishing the regional beach-dune profile monitoring network. The process began with the collaborators meeting several times to discuss the placement of approximately 60 new transects along the littoral cell, a 32-mile section of shoreline stretching from Little River to the mouth of the Eel River. Using air photos and applying the collective expert knowledge of the dune system held by the collaborators, preliminary locations were selected that would encompass the full geographic range of the study area from north to south while also representing conditions typical of each stretch of coastline. These conditions include different topography and vegetation types, as well as known areas of ecological and infrastructure vulnerability such as washover areas on the South Spit Eel River or erosional areas along the Humboldt Bay Municipal Water District pipeline. Each of the property owners/managers were involved in identifying areas of interest on their land.

During this period, PIs Andrea Pickart and Ian Walker, together with Conor Shea (USFWS) developed a preliminary protocol for surveying beach-dune profiles along transects. Each transect consists of a series of points aligned with prevailing wind, and running from approximately mean sea level (or lower) inland for up to 500 m. The spacing of points varies along a given transect, with more closely spaced points in the more dynamic portions of the transect, particularly the foredune zone. Each time a survey is conducted, elevation as well as vegetation cover/height will be collected at each of these points. This will allow investigators to measure changes in the profiles over time, and to relate these changes to vegetation as well as physical characteristics.

The next step was to train survey participants to use the specialized equipment needed to refine transect locations and establish them on the ground. Conor Shea of the USFWS Coastal Program led a two-day training

session for those collaborators who will actually operate the surveying equipment. The survey employs real-time kinematic GPS (also known as RTK GPS), which utilizes satellite data collected in "real time" to obtain precise elevation and spatial (positional) data. Training included assembly and use of the RTK GPS, and transfer of data.


Candace Reynolds and Britta Countryman assembling base station RTK

This equipment is now being used by grant Research Assistants Britta Countryman and Candace Reynolds to survey in the benchmarks needed to locate and survey transects. A benchmark is a reference point representing a highly accurate elevation and geographic location. This level of accuracy requires that RTK GPS measurements be collected for four hours at a stationary point. Once a benchmark is established, it can be used to more rapidly collect elevation and spatial location data nearby. Each benchmark covers a stretch of coastline containing multiple transects. For the surveys, the RTK GPS will be used to navigate to the transect data collection points where a position/elevation point is collected and vegetation cover and height is measured.

Also ongoing is the finalization of transect locations. This is done in the field, and final locations are informed by preliminary transect locations and benchmark locations in addition to the site characteristics mentioned above. Transects for each collaborator's land are finalized by the grant PIs in consultation with property owners/managers. Benchmark installation and transect establishment will be completed in time for the first survey scheduled for early 2016.

North Spit Adaptation Site


CCC members removing and piling European beach grass (Ammophiila) in the Adaptation site

At the North Spit adaptation demonstration site, located at the Lanphere Dunes Unit of Humboldt Bay National Wildlife Refuge, the California Conservation Corps removed European beachgrass from the foredune in the southern half of the site (resprouts will continue to be dug over the winter). On one segment of foredune, beachgrass was left in place to serve as an experimental control. A second control segment consists of existing, adjacent, native foredune vegetation. Graduate student Alana Rader from the University of Victoria Department Coastal Erosion and Dune Dynamics Lab visited the site prior to beachgrass removal, and, with help from fellow grad student Mike Grilliot and co-PI Ian Walker took precise measurements of topography over the entire experimental site. Measurements consisted of a combination of RTK GPS and terrestrial LiDAR. The latter uses a laser scanner in combination with reflectors to literally scan the surface, resulting in a highly accurate, 3-dimensional representation. In addition, Laurel Goldsmith (USFWS) conducted pre-project vegetation surveys with the help of Refuge Interns. In preparation for later planting of the foredune, seeds of native dune species were collected, cleaned and stored by the Research Assistants and Refuge Interns following methods used locally in the past, and documented by Andrea Pickart and John Sawyer in their book "Ecology and Restoration of Northern California Dunes." These seeds will be used later in the winter to supplement vegetative transplants into the

different foredune treatment areas.

Public Outreach

A public outreach plan has been developed by Carol Vander Meer (Friends of the Dunes) to keep the public informed about the progress of the grant. The plan incorporates a number of different strategies including quarterly email updates, community presentations, public education and outreach meetings, public guided walks, and school education programs. The Dunes Climate Ready Grant will be introduced at a public meeting of the Humboldt Coastal Dunes Cooperative on November 18th, from 7 to 8:30 pm at the Humboldt Coastal Nature Center and a guided walk of the North Spit demonstration site is scheduled for November 21, 10 am to 12:30 pm as part of the community education and outreach portion of the grant. More information about the grant is available on the Friends of the Dunes website or you can sign up for email updates here.

For additional background information visit the following websites:

Humboldt Bay National Wildlife Refuge
University of Victoria Coastal Erosion and Dune Dynamics Lab
State Coastal Conservancy
Friends of the Dunes

Friends of the DUNES

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