

National Park Protects Rare Plants With Predictive Growth Map Created With LiDAR Data

Objective

To help a national park identify and protect areas of rare plant species growth in coastal areas, by modeling vegetation zoning using LiDAR Data and creating a predictive vegetation distribution map.

Challenge

The national park wanted to improve its rare species management capabilities. The park also wanted to decrease the amount of fieldwork required and analyze the maximum amount of a coastal area.

They needed a partner capable of deriving an accurate statistical model that would give reliable predictions of plant growth.

Quick Facts

- ✓ Created cost-effective custom predictive model
- ✓ Combined use of historical data and modern survey methods
- ✓ Covered over 18 km of coastal strip with a unique eco-system

It also should identify danger areas and make fieldwork and rare plant species protection more focused and efficient.

The park tapped Intetics as an experienced provider to fulfill the task.

Solution

The first vital step was to accurately identify the variables indicative of plant distribution. Due to the small scale of the phenomenon, broad factors like light, temperature, precipitation, and altitude were assumed constant.

The model considered factors that vary on a local scale, such as the area's micro-topography.

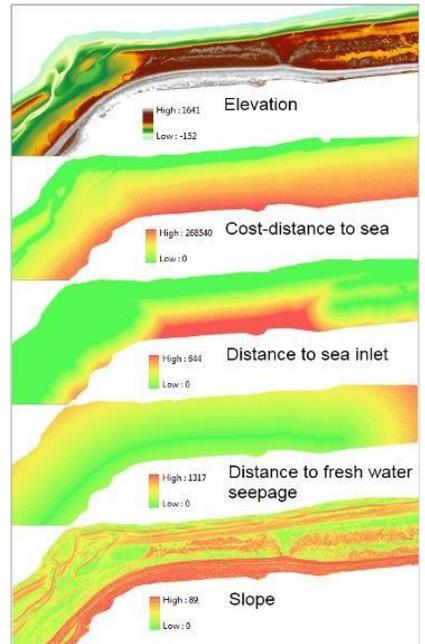
To identify these vegetation patterns, Intetics geo-engineers developed a detailed digital elevation model by

★ 01

Creating a high-resolution amp based on aerial LIDAR data to identify elevation-related variables that influence vegetation growth patterns.

★ 02

Creating supplemental raster maps for cost-distance to the sea distance, sea inlet, distance to freshwater seepage and slope.



The second step was to check whether the identified variables had a significant effect on vegetation distribution.

★ 03

The variables derived were tested against field data of plant presence/absence using correlation analysis.

★ 04

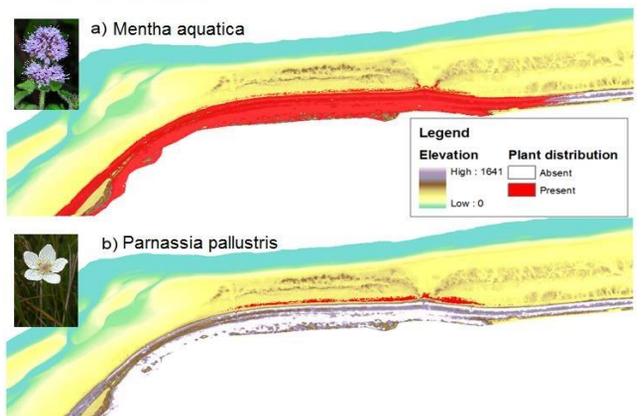
This verified whether the predictors had a statistical effect on vegetation distribution.

Finally, the predictive model was used to identify vegetation distribution on the coastal area.

Statistical analysis was run to derive parameters for modeling, which helped produce maps of specific plants presence and absence.

Test field data was used to assess model accuracy.

Distribution Map for:



Client's reference



We are thrilled to work with this new tool. It minimizes the time and cost of fieldwork and makes our conservation work much more efficient.

Benefits and Results

- ★ The client received a predictive modeling tool able to create growth distribution maps for several plant species
- ★ Obtained the complete prediction model of plant distribution on its territory.
- ★ The model shows the predicted habitat location of selected species at a specified probability threshold.
- ★ Since the prediction tool significantly decreases time required for field work, the client can make their land management process more efficient.