

Natural and Working Lands Climate Smart Strategy

Appendix F: Land Cover Data Methodology

April 22, 2022

Overview

This strategy necessitated the development of a Generalized Land Cover data set to provide context to the discussion of land strategies. These land cover types align with the land cover classes suggested by the Intergovernmental Panel on Climate Change (IPCC) and draw from similar data sources and groupings to the California Air Resources Board's 2018 Natural and Working Lands Carbon Inventory.

Description

Land cover is a representation of the physical characteristics of an area and what is present in or on it. Land use identifies how land and land cover is utilized. For example, a grassland (land cover) may be used for grazing livestock leading it to have a land use that could be described as grazing or rangeland. Similarly, grazing could occur in shrub, forested, or several other land cover types.

Based primarily on the most recent release of LANDFIRE v2.0.0, the Generalized Land Cover dataset underpinning this strategy provides full coverage of California including to the three nautical mile limit offshore. It represents a ground condition of 2016 divided into 30m x30m cells across the entire state.

The state is grouped into the following land cover classes: forests, shrublands and chaparral, grasslands, croplands, wetlands, seagrasses and seaweeds, developed lands, and sparsely vegetated lands. The mapped area has been extended offshore to three nautical miles. Lakes, reservoirs, rivers, and oceans that do not overlay seagrasses and seaweeds are identified in as "open water." More detail on land cover definitions is available in Appendix A.

LANDFIRE v.2.0.0 provides the source for much of the land cover and is an integrated dataset with many layers. The Existing Vegetation Type (EVT) and Biophysical Settings (BPS) layers provide inputs to this data set. The EVT layer contains data on life form (tree, shrub, herb, developed, agriculture, sparse, barren, snow-ice, or water), a named vegetation type, and notes on recent disturbance. These are used to assign a likely generalized land cover type to each pixel. This result is then refined using the BPS layer to suggest the land cover that might exist in recently disturbed (fire or logging) areas absent that disturbance.

These results are then supplemented through the creation of a seagrasses and seaweeds dataset by combining data on the presence of eelgrass and kelp canopy and replacing the water category with seagrasses and seaweeds where it is present.

These data result from the integration of remote sensing (satellite imagery analysis), with field data, using computer algorithms under the oversight of the LANDFIRE team or the teams developing the seagrass and kelp maps. Errors are expected in all data and while every attempt is made to minimize and understand them, they cannot be eliminated. As a result, the cells in the data represent an estimate of what is on the ground at that specific location. Validation techniques used in the production of the data help identify and allow for correction of gross errors, but individual pixels, or even small groupings of them may differ from real world conditions. Similarly, while efforts are made to be consistent with the selection of the source satellite data, the difference

between seasons or a wet versus dry year do impact the final maps, notably water and wetlands.

Relationship to other Efforts

California's 2018 Inventory of Ecosystem Carbon in California's Natural & Working Lands included the use of LANDFIRE representing a 2014 ground condition. Using similar groupings, but updated data, this land cover is based on classifying a structurally similar dataset to produce a generalized land cover map for 2016. Due to the difference in year 2016 (LANDFIRE v2.0.0) vs 2014 (LANDFIRE v1.4.0), an updated mapping process, and the selection of Landsat data used by the LANDFIRE project to develop LANDFIRE v2.0.0, differences between the 2016 and 2014 ground conditions are expected.

These data are intended for use in the Natural and Working Lands Climate Smart Strategy and for inclusion in CA Nature (<https://californianature.ca.gov>), an online mapping companion to the Natural and Working Lands Climate Smart Strategy and 30x30 goal established by Governor Newsom's Executive Order N-82-20.

Data Sources

LANDFIRE: LANDFIRE Existing Vegetation Type layer.(2013 - 2021). U.S. Department of Interior, Geological Survey.[Online]. Available: https://landfire.gov/version_download.php [Accessed: February 3, 2021].

LANDFIRE: LANDFIRE Biophysical Setting layer.(2013 - 2021). U.S. Department of Interior, Geological Survey.[Online]. Available: https://landfire.gov/version_download.php [Accessed: February 3, 2021].

Bell, T, K. Cavanaugh, D. Siegel. 2020. SBC LTER: Time series of quarterly NetCDF files of kelp biomass in the canopy from Landsat 5, 7 and 8, since 1984 (ongoing) ver 13. Environmental Data Initiative. <https://doi.org/10.6073/pasta/5d3fb6fd293bd403a0714d870a4dd7d8>. Accessed 2021-04-08. (Data extraction performed by T. Bell April 8, 2021)

Eelgrass Survey GIS Data version 2.0 (2017, updated 2020), National Marine Fisheries Service West Coast Region. Available: <https://www.sfei.org/data/eelgrass-survey-gis-data#sthash.u94SjLu7.afUwqGJA.dpbs> [Accessed: April 6, 2021)