

State of Hawaii Biomass On-line Mapping Application – Metadata Guide

Introduction

The Office of Planning is the lead agency for the State of Hawaii's Geographic Information System (GIS). The Office of Planning GIS Program leads the State's multi-agency effort to establish, promote and coordinate the use of GIS technology among Hawaii State government agencies. The State Office of Planning is responsible for the planning and coordination of activities that are critical to the State's enterprise GIS. The primary goal of the Statewide GIS Program is to improve overall efficiency and effectiveness in government decision-making.

As a public service, the State GIS Program is making available a Biomass Resources on-line mapping application developed for the Department of Business, Economic Development, and Tourism, Strategic Industries Division. The application is available at <http://gis.hawaii.gov/website/biomass>.

The map layers presented in this internet mapping application were generated using data gathered during a statewide biomass resource assessment conducted in 2002, "Biomass and Bioenergy Resource Assessment" prepared by the Hawaii Natural Energy Institute for the Department of Business, Economic Development, and Tourism. The full report is available at <http://www.hawaii.gov/dbedt/info/energy/publications/biomass-assessment.pdf>. The maps are meant to supplement the above report and contain only a portion of the information presented therein. It is highly recommended that individuals interested in the maps download and read the full report to familiarize themselves with the data collection methods, data sources, and data points that are not covered by the supplementary maps.

The Geographic Information System (GIS) maps were developed to provide access to certain information contained in the resource assessment for alternative energy developers and state and county planners. The interface allows individuals who lack GIS training to access a portion of the information contained in these maps. Data that cannot be accessed using the on-line biomass application include some attribute values and descriptions along with comments provided by the map creator about the data and presentation. This information has been summarized and is available below.

1.0 Transfer Stations

1.1

About the Data

This data set includes the locations, and names of county operated transfer stations and convenience centers on the Islands of Hawaii, Maui, Oahu, and Kauai. Data were taken from information gathered during the completion of the "Biomass and Bioenergy Resource Assessment" prepared by the Hawaii Natural Energy Institute for the Department of Business, Economic Development, and Tourism.

1.2

Layer Attributes for All Islands

FID	Internal feature number
Shape	Feature geometry
TMK	Tax map key number
NAME	Name of site
PARCEL_SIZ	Area, in acres, of the parcel that the transfer station resides upon. Values taken from the County of Hawaii's transfer station enhancement plan.
Pop_SRVD	Estimate of the population served by an individual transfer station. Values taken from the County of Hawaii's transfer station enhancement plan.
AVG_TPY	Average waste received in tons per year. Values taken from the County of Hawaii's transfer station enhancement plan.

2.0 Landfills

2.1

About the Data

This data set includes the location, size, and names of county operated landfills and waste to energy facilities on the Islands of Hawaii, Maui, Oahu, and Kauai. Data were taken from the "Biomass and Bioenergy Resource Assessment" prepared by the Hawaii Natural Energy Institute for the Department of Business, Economic Development, and Tourism.

2.2

Layer Attributes for All Islands

FID	Internal feature number
STDY_URL	Web html address for accessing the composition study
Shape	Feature geometry
Name	Name of site
TMK	Tax map key number
YEAROPENED	Year that indicated landfill opened
CLOSURE_YR	Year that landfill was closed or is planned to close.
COMP_STDY	Y, composition study conducted. N, composition study not available
BMAS_WASTE	Portion of waste added (tons per year) that could be used as fuel. Value is made up of primarily biomass wastes such as paper, greenwaste, foodwaste, lumber and others, but also includes contributions from plastic and other non biomass derived wastes. For further information see the "Biomass and Bioenergy Resource Assessment" prepared by the Hawaii Natural Energy Institute for the Department of Business, Economic Development, and Tourism.
WASTE_ADD	Waste (tons per year as received) added to the landfill
WASTE_INPL	Waste (tons per year as received) added to the landfill from opening to present or closure.

2.2.1

Additional Attributes for the Oahu Landfills Layer

Designator	0=Landfill, 1=Waste to energy plant
PLANT_CAP	Capacity in tons per year (as received)
COMP_URL	Web html address for accessing the composition study

3.0 Wastewater Treatment Plants

3.1

About the Data

This data set includes the locations, design capacities and names of county operated wastewater treatment plants on the Islands of Hawaii, Maui, Oahu and Kauai. Data were taken from information gathered for the "Biomass and Bioenergy Resource Assessment" prepared by the Hawaii Natural Energy Institute for the Department of Business, Economic Development, and Tourism.

3.2

Layer Attributes for All Islands

FID	Internal feature number
Shape	Feature geometry
TMK	Tax map key number
NAME	Name of site
DESIGN_FLO	Treatment plant design flow rate in million gallons per day.
TREATMENT	Treatment level, primary, secondary, tertiary
TRT_METHOD	Treatment technique, activated sludge, biotowers, settling ponds, etc
EFFLNT_DES	Effluent destination and/or disposal method
CURRENT_FL	Current input flow rate in million gallons per day
SLUDG_PRD	Sludge production in dry tons per year

4.0 Agwastes Hawaii

4.1

About the Data

This data set includes the location, quantity and disposal methods for agricultural wastes generated by the Macadamia Nut industry on the Island of Hawaii. Data were taken from information gathered during the "Biomass and Bioenergy Resource Assessment" prepared by the Hawaii Natural Energy Institute for the Department of Business, Economic Development, and Tourism.

4.2

Layer Attributes

Shape	Feature geometry
TMK	Tax map key number
FID	Internal feature number
NAME	Name of site
SHLS_PROD	Quantity of macadamia nut shells produced in dry tons per year
SHLS_USED	Percentage of waste stream currently in use
USE	Current use of waste material
FUEL_ANLYS	Y=fuel analysis of waste conducted, N=fuel analysis of waste not conducted. Fuel analyses were not performed for shells gathered at each factory but values should be representative.
HHV	Higher heating value in mega joules per kilogram
ASH	Percent ash in fuel, from fuel analysis

5.0 Agwastes Kauai and Maui

5.1

About the Data

This data set includes the location, quantity and disposal methods for agricultural wastes generated by the sugar cane industry on Kauai and Maui. Information on waste generated by the pineapple industry on Maui is also included. Data were taken from the "Biomass and Bioenergy Resource Assessment" prepared by the Hawaii Natural Energy Institute for the Department of Business, Economic Development, and Tourism.

5.2

Layer Attributes

FID	Internal feature number
Shape	Feature geometry
TMK	Tax map key number
NAME	Name of site
MOLASSES	Tons of molasses produced per year in as received condition
CANE_TRASH	Estimate, in dry tons per year, of cane trash in fields
BAGSE_USED	Dry tons per year of bagasse used for power production
BAGASSE	Dry tons per year of bagasse fiber produced during sugar processing
MOLAS_USED	Tons per year of molasses that is sold for alternative uses, primarily as a cattle feed supplement

5.2.1

Additional Attributes for the Maui Agwastes Layer

PINEAPPLE	Estimate, in dry tons per year, of pineapple skins produced in canning operations
PINE_USED	Dry tons per year of pineapple skins sold as cattle silage

6.0 Waiakea Timber Management Area

6.1

About the Data

This data set includes details of the forestry resource found in the Waiakea Timber Management Area. Data were created by the State Department of Land and Natural Resources (DLNR) Division of Forestry and Wildlife (DOFAW). This data is incomplete and represents only an estimation of the timber resource found in the WTMA. The data should not be used as the sole source of information for developing a business plan. Further information can be obtained through DOFAW at DLNR. Additional data points for higher heating value, and ash percentage were taken from fuel analyses conducted during an investigation conducted by the Hawaii Natural Energy Institute on privately operated timber areas on the Hamakua Coast. Areas designated commercial in the "Market Research on Commodity Wood Products from 8 Non-Native Hawaiian Grown Timber Species" report conducted by Jaakko Poyry Consulting were also added to the existing data.

6.2

Layer Attributes

FID	Internal feature number
Shape	Feature geometry.
NAME	Name of site
AREA	Area of sampled plot in square feet
PERIMETER	Perimeter of sampled plot in feet
CALCACRES	Calculated acres based on Area value
TYPE	Species and tree size
FB	Flindersia brayleyana
ES	Eucalyptus saligna and grandis
ER	Eucalyptus robusta
ED	Eucalyptus deglupta and pilularis
TC	Toona ciliata
FU	Tropical Ash
AN	Nepal Alder
CJ	Sugi Pine
AK	Acacia koa
MP	Ohia
XH	Experimental Hardwood
00	Recent plantings/sapling stands
11	Low volume pole and saw timber
22	Low to moderate volume pole and saw timber
33	Moderate volume pole and saw timber
44	High volume pole and saw timber
55	Moderate volume saw timber
66	High volume saw timber
STANDNO	Stand number as recorded in the WTMA report.

NET_ACRES	Name
Fuel_A	Fuel analysis conducted on fuel samples collected from this species during an investigation conducted by the Hawaii Natural Energy Institute. Values are for samples collected on plantations managed by Forest Solutions Inc. on the Hamakua coast and as such should be considered approximations of values that might be found for the Waiakea stands.
Ash	Percent ash in fuel samples for indicated species taken from privately owned timber stands on the Hamakua coast.
HHV	Higher heating value of fuel samples for indicated species taken from privately owned timber stands on the Hamakua coast.
COM_SAWLOG	Plot areas designated commercial in the "Market Research on Commodity Wood Products from 8 Non-Native Hawaiian Grown Timber Species" report conducted by Jaakko Poyry Consulting. Y=commercial, N=noncommercial.

7.0 Food Wastes

7.1

About the Data

This data set was created by combining the zip code shape file obtained from the Hawaii GIS website and data on food waste recycling obtained in a survey conducted by the University of Hawaii for the Department of Agriculture. The data provided by this survey should not be considered complete but could be a good indicator of areas where a high density of food waste might be present. Estimates of total food waste generation by county were developed in the "Biomass and Bioenergy Resource Assessment" prepared by the Hawaii Natural Energy Institute for the Department of Business, Economic Development, and Tourism, but could not be defined at the zip code level.

7.2

Layer Attributes

FID	Internal feature number
Shape	Feature geometry
OBJECTID	ID Number
ZIP	Zip Code Number
PO_NAME	Zip Code Name
AREA	Area in acres
SUMBLKPOP	Sum of the 2000 population for the Census Bureau block polygon centroids that fall within the zip code area.
POP2001	2001 population count estimate as estimated by ESRI BIS.
TONS_YEAR	Sum of food waste recycled within specified zip code in tons per year. Data were taken from a food waste recycling survey conducted by the University of Hawaii. Sample size of the survey is small and should only be used as potential indicator of areas of high density and does not reflect the estimated total food waste produced in any given area.

8.0 Fats, Oils and Grease (FOG) Waste

8.1

About the Data

This data set was created by combining the zip code shape file obtained from the Hawaii GIS website and data on fats, oils and grease (FOG) waste recycling obtained in a survey conducted by the University of Hawaii for the Department of Agriculture. The data provided by this survey should not be considered complete but could be a good indicator of areas where a high density of FOG waste might be present. Estimates of total FOG waste generation by county were developed in the "Biomass and Bioenergy Resource Assessment" prepared by the Hawaii Natural Energy Institute for the Department of Business, Economic Development, and Tourism, but could not be defined at the zip code level.

8.2

Layer Attributes

FID	Internal feature number
Shape	Feature geometry
OBJECTID	ID Number
ZIP	Zip Code Number
PO_NAME	Zip Code Name
AREA	Area in acres
SUMBLKPOP	Sum of the 2000 population for the Census Bureau block polygon centroids that fall within the zip code area.
POP2001	2001 population count estimate as estimated by ESRI BIS.
GALLONS_PE	Gallons of FOG waste recycled per month within the indicated zip code boundary. Data were taken from a food waste recycling survey conducted by the University of Hawaii. Sample size of the survey is small and should only be used as a potential indicator of areas of high density and does not reflect the estimated total FOG waste produced in any given area.

9.0 Animal Wastes

9.1

About the Data

This data set was created by dissolving the coast layer (from Hawaii GIS website) polygons into their respective counties and joining the new layer with data on animal wastes found in the "Biomass and Bioenergy Resource Assessment" prepared by the Hawaii Natural Energy Institute for the Department of Business, Economic Development, and Tourism.

9.2

Layer Attributes

FID	Internal feature number
Shape	Feature geometry
County	County name
SWINE_W	Swine waste in dry tons per year
DAIRY_W	Dairy waste in dry tons per year
POULTRY_W	Poultry waste in dry tons per year. The quantity of poultry waste generated on Maui, Kauai, and Hawaii has been combined into a single value to protect the identities of individual farms.