

Notes on Some Waimānalo Soils

Azevedo Field

These notes are offered in the context of the City and County of Honolulu's failure to support existing athletic fields at Waimānalo District Park, a.k.a. Azevedo Field. In addition, because of interest in the city's recent, attempted imposition on the community of an unwanted and unneeded athletic complex at Waimānalo Bay Beach Park, some further information is provided on soils of that area, and Bellows in general.

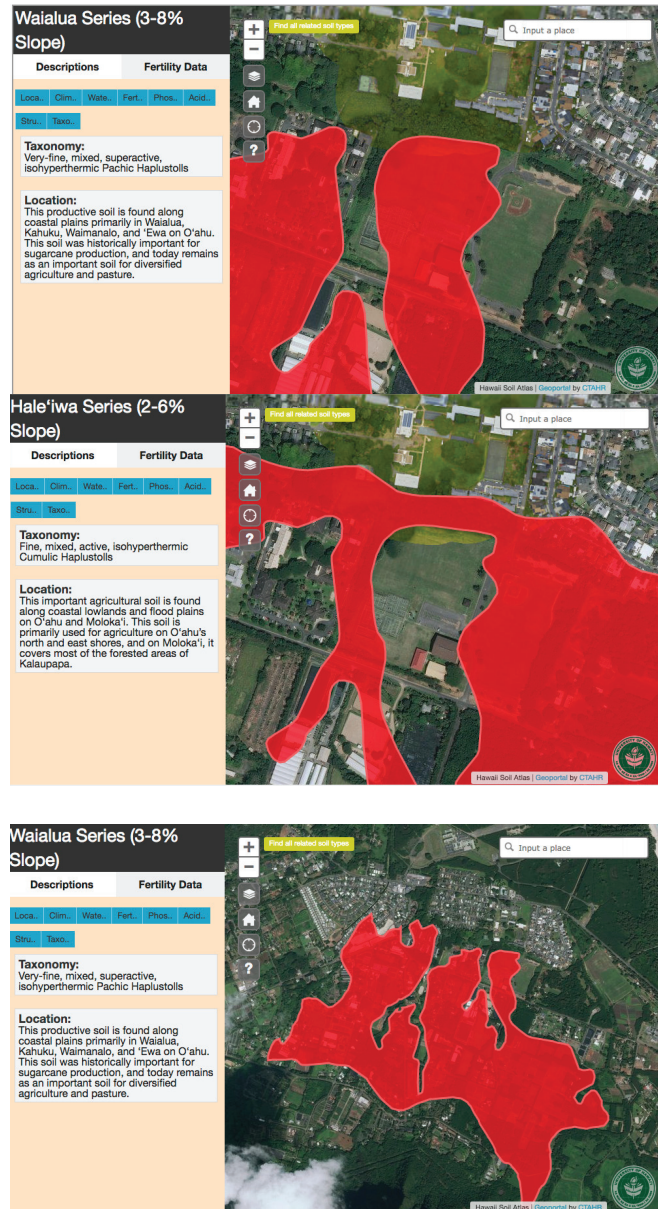
Regarding maintenance of Azevedo Field, the Department of Parks and Recreation and Waimānalo councilperson Ikaika Anderson have consistently claimed that the problem prohibiting appropriate maintenance of the functioning of these fields for keiki athletic purposes is the underlying "clay soil." They have pointed out that during dry periods, cracks open in the soil, presenting a hazard in the event that a participant in an athletic program might trip, resulting in injury for which the City and County would be liable.

The soils at the park are similar to soils widespread in Waimānalo and elsewhere on this island, as described in the soil survey of Oahu (U.S. Govt. Printing Office, 1972). The park lies on two soil series, roughly separated by the access roadway bisecting the park from mauka to makai. On the Kailua side is the Waialua soil series; on the Makapu'u side is the Hale'iwa soil series. Both these soils are composed partially of clays known to have "moderate" shrink-swell potential, due to their mineral make-up, with the Waialua series having this characteristic slightly more pronounced. These brown-to-grey soils differ from the red soils characteristic of the central Oahu plains, which do not shrink and swell due to moisture content.

Soils similar to the Azevedo site are common throughout Waimānalo, except in the near-shore areas. Soils underling the Olomana golf course are similar except that some of them, such as the Kaloko soil series, have an even more pronounced tendency to crack if dried. We don't hear of problems with golfers losing their balls to cracks in the fairways, or stumbling and falling. This may be because the links and greens are adequately irrigated to prevent drying and cracking.

The soil surveys of the state* were done by the USDA Soil Conservation Service (now the Natural Resources Conservation Service), and much of the scientific data was developed by soil scientists and soil min-

The Waialua and Hale'iwa soils at Waimanalo District Park



Extent of Waialua series mauka of Azevedo Field. Structure: swells slightly when wetted and shrinks when dried, which creates cracks and unstable conditions for construction over time....Additions of organic matter can improve soil tilth.

*The *Soil Series of the State of Hawaii* was published in two volumes by the U.S. Government Printing Office. An online version was created by UH-CTAHR and can be found at gis.ctahr.hawaii.edu/SoilAtlas.

eralogists, long retired, with the University of Hawai‘i’s (former) Department of Agronomy and Soil Science. Both of these entities, having done their work in characterizing Hawai‘i’s soils and their management, have moved on to focus mainly on other objectives.

The science of managing these soils, however, remains the same despite changes in the bureaucracies. It’s just physics: the interaction of hydrology and clay minerals. If the Azevedo soils are prevented from drying out by appropriate irrigation, they will not crack. If their cracks when dry are filled with sand or organic matter or a mixture of these, they will be ameliorated to be less prone to cracking, as long as an irrigation regime is subsequently maintained.

Mayor Caldwell, in a communication dated 9/25/19, stated, “because of the clay material that comprises the field, the top layer would need to be replaced every few years....” Few soil scientists would substantiate that claim. Councilperson Anderson claimed in a public meeting that the irrigation system had been fixed twice to no avail and that it wasn’t worth the effort to fix it yet again, or words to that effect. The former park manager stated that the city had provided brass irrigation fixtures that were stolen, and that his request for plastic fixtures was ignored, more brass fixtures were installed, and these were again stolen.

It is up to the City’s Department of Parks and Recreation to do what’s necessary to make these athletic fields usable for Waimānalo’s youth by ensuring that the irrigation system in the park is up-to-standard, maintained, and run consistently. If additions of sand and/or compost are desired as topdressings, these can be applied for much less than the many millions of dollars that the department once claimed would be required to make these fields usable. The City’s municipal composting system is nearby and available. Water for irrigation is available from the State’s agricultural irrigation line running along Hihimanu Street, so no expensive municipal potable water need be used. The department’s director has stated that efforts are under way to repair the existing irrigation system, and that it is considering other rehabilitation strategies for the soil. We’ll see if the former no-can-do approach will finally be discarded.

The suspicion is widespread in the community that the City has a hidden agenda for the park property, and that allowing the facility to deteriorate and go unmaintained is part of a strategy to justify development of the unwanted and unneeded Waimānalo Bay Beach Park regional athletic complex, thus freeing the Azevedo acreage for other, unknown purposes.

The Sherwood Forest Site

Land leased from the Waimānalo Sugar Plantation became a Military Reservation in 1917 and was named Bellows Field in 1933 and then Bellows Air Force Station in 1958, when the runways were closed. Since 1947, much of the northern, coastal portion has been used primarily as a recreation facility for military personnel. In 1966, the military gave the portion between its former Nike missile site and the residential Waimānalo beach lots to the state, which named it Waimānalo State Recreation Area. The state subsequently turned it over, in 1992, to the Honolulu City and County, which named it Waimānalo Bay Beach Park, supposedly dedicated solely to “beach recreation.” The Honolulu government has a plan to convert much of its area, currently under forest, to a huge regional athletic complex with expanded parking and large-group camping facilities.

The soils of the Waimānalo coastal area are sandy dune remnants, predominantly the Jaucas soil series, which is of low fertility and has extremely fast permeability to rainfall. The current coastal forest consists primarily of two “pioneer” species introduced within the past 150 years, *Leucaena leucocephala* (koa haole) and *Casuarina equisetifolia* (“ironwood”). These are pioneers because, unlike most plants, they have the advantage of obtaining nitrogen from the air in the soil via symbiosis with specialized root bacteria, thus enhancing the fertility of the soils they occupy.

Over the past century of federal occupation, the entire Bellows site has been worked over extensively by the military with roadways, runways, missile emplacements, and building facilities, generally with little regard for the ethos of aloha ‘āina. Very little extensive or comprehensive archaeological work has been done, despite the recognition that the area is home to one of the earliest identified Marquesan habitations in the archipelago and has been placed on the National Register of Historic Places.

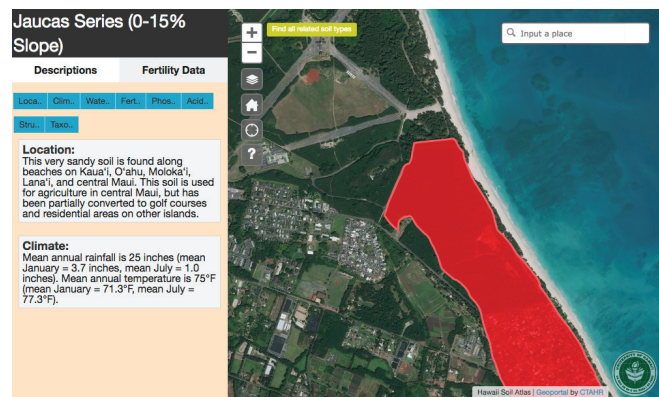
The City’s project to convert the park from beach-oriented to sports-oriented recreation is currently (March 2020) in its first phase. At the current site, near the highway, just inside the park, a proposed multi-purpose athletic field would be created by adding as much as eight inches of fill soil brought from elsewhere. Initial indications from the Mayor’s office are that the fill would consist of four inches of saprolite material (informally known to soil scientists as “rotten rock”) from the Kapa‘a area, covered with another four inches of “topsoil” from an unspecified location. Both of these materials would severely compromise

the rainfall infiltration capacity of the soil indigenous to the site, potentially resulting in runoff and erosion into the adjacent highway area and possibly nearby waterways, in violation of Clean Water Act regulations.

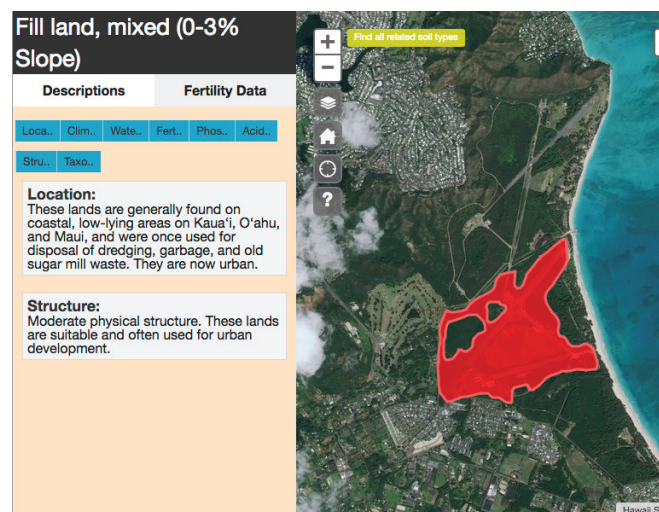
The fill soil would be sown with a turfgrass, as yet unspecified, which would be maintained with an irrigation system using potable water, as well as with chemical fertilizers and, most likely, a preemergence herbicide. A parking lot adjacent to the field would be constructed of impermeable material, underlain with herbicide. Although the latest specifications for this development have not been made available as of this writing, it is believed that the parking will accommodate tour buses and include turn-in and turn-out driveways for them, as well as an unspecified number of stalls for other vehicles, and handicapped stalls.

This development is considered by many in the community as inappropriate and counter to the long-standing commitment by state government to preserve the rural character of Windward O'ahu communities. Since the City began destruction of the forest for the initial phase of its athletic complex project, in April 2019, a movement of protectors (kia'i) has risen in defence of Sherwood Forest. There is widespread feeling among these citizens that enough has been done over many decades to disrespect the cultural significance of the area and the natural resource and endangered wildlife habitat the existing coastal forest represents. Going forward, they insist that the current urbanization effort in the Waimānalo Bay Beach Park be stopped and the wishes of the community be foundational to further actions to modify the area. It is essential, they believe, that mālama 'āina be the guiding motivation for management of the park.

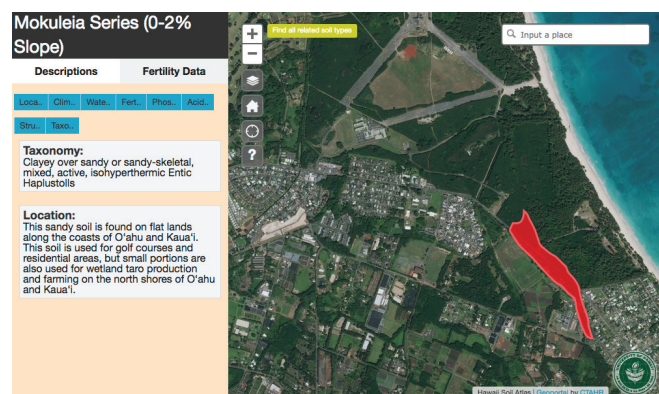
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The red area is just part of the extensive Jaucas soil area in the Bellows, Sherwood Forest, Waimānalo beach lots, and other coastal sections of Waimānalo.



A large area of the Bellows military base has been so profoundly disturbed by human activity that it cannot be classified as a soil series.



The Mokulē'ia soil is a gradient between the sandy Jaucas soil and the more clayey soils of more inland areas. Here it occupies a strip in the mauka part of Sherwood Forest, along Kalaniana'ole Highway.