

# *Village Planning: 'Aunu'u Island*

## *A White Paper*

*Department of Commerce,  
American Samoa Government  
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by

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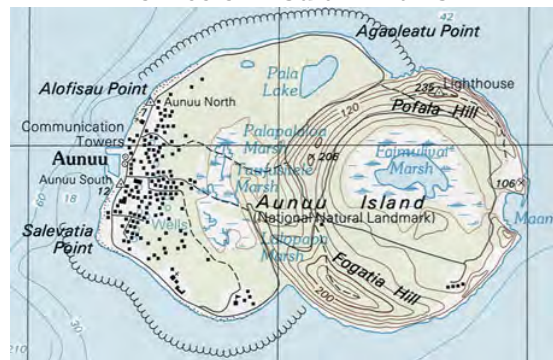
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Fuiava, Saole, Tuisauma, Lemafa \*, Taufi \*, Taufolo, Talaimatai, Umi, Saau, Vaiaua,  
Sagatu, Mata'u, Lauvao \*, Sagale \*, Matila, Foromaitu\*, Seau

\* Vacant Titles

(About 40 matai and 7 sa'o in Aunu'u)

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## Press Release

### **ASG collaboration to assess economic and land development in Aunu'u, led by DOC**

Governor Lolo Moliga's Adopt-A-School initiative has not only forged partnerships between ASG agencies and the Department of Education but has also brought together ASG agencies to determine sustainable economic development opportunities in Aunu'u. Hand in hand with the Aunu'u village council, the Department of Commerce is leading this project to assess the needs for planned use development and economic village based initiatives; the effort engages all stakeholders with the ASG agencies to provide for meaningful actionable plans in Aunu'u.

This model of collaboration will be replicated in Ta'u, inclusive in their development plan. Aunu'u and Manu'a islands present different challenges and assessment of needs that require dialogue and commitment not just by the ASG agencies but also in partnership with the villages and village councils. Acting territorial planner Liné-Noue Kruse authored several Office of Interior grant proposals that were awarded to ASG, one grant is now funding the work that is being done in Aunu'u, and will be implemented in Manu'a. Director Lafaele and staff, Tafuna industrial park manager Misipati Salanoa, Liné-Noue Kruse, University of Hawai'i professor of planning and architect Dr. Luciano Minerbi, project lead Leifiloa Carol, and GIS technician Kang Sevaio (Aunu'u resident) met with the Aunu'u Representative Talaimatai Elisara Su'a, Mayor Aleaga Nili, and village council to solidify this partnership, expected outputs, and goals of this work in Aunu'u which has already produced a report from the village council to DOC on the needs and economic opportunities in Aunu'u. DOE Director Vaitinasa Salu Hunkin-Finau authorized a space at A.P. Lutali Elementary for the DOC to work closely with the Adopt-A-School program and to coordinate and implement economic initiatives in Aunu'u. It is the intention of the DOC to engage administrators, teachers and students of the A.P. Lutali Elementary in shaping the outcome of the economic development of their community.

In order to address economic initiatives in Aunu'u and furthering this project what implementation framework will be needed to address economic opportunities Manu'a, DOC sought out ASG intra-agency collaboration. ASPA CEO Utu Abe Malae, ASEPA Ameko Pato, DPW Director Faleosina Voigt, and ASHPO Director David Herdrich are collaborators to this project to assess the economic and land opportunities in Aunu'u. Last wednesday, ASEPA Director Ameko Pato, Deputy Director Fa'amau Asalele, water specialist Casuallen Fale, ASPA water division manager Taylor Savusa, water chief operator Danielle Meleah, DOC acting territorial planner Liné-Noue Kruse, University of Hawai'i at Manoa professor of planning and architect Dr. Luciano Minerbi, GIS specialist Kang Sevaio, Moli Lemana, and Faitasi Sene completed a site visit with Representative Talaimatai.

The site visit explores what challenges and opportunities exist to develop any desired sector by the village council in coordination with DOC. Historically the two main sources of economic activity for the Aunu'u people for the last fifty years are taro and making faausi. The Aunu'u village council submitted to

DOC their economic development challenges, identifying agriculture as a challenging sector to advance. The two main challenges identified is the declining motivation for young men and women to work the taro plantation and the fau tree invasion on the taro plantation. Adding to the challenges to agricultural production is the belief that there is a disease affecting the taro plantation and possible leaching of lead from the scrap metal in the landfill that is hurting the tilapia. Their identified prioritized needs for the island are an elementary school van, passenger vessel, health clinic, cement road around the entire island connected to their evacuation routes, and fortified sea wall from the wharf to the A.P Lutali Elementary school.

DOC has already moved on the agricultural segment of economic opportunity by developing zoning maps by Liné-Noue Kruse and Dr. Luciano Minerbi to recommend zonation that will demarcate the existing urban area from the areas of conservation and agriculture to ensure longevity to any agriculture intensification program. Coastal zone manager Sandra Lutu is sending GIS technicians Kang Sevaio and Robert Koch to conduct GPS mapping of the agricultural lands and urban areas to survey how much lands are actually being farmed for agricultural purposes and what lands are then left for possible intensification of taro, mango, moli, pineapple, banana, peas, cucumber, and pumpkin. The GPS mapping will assist the village, DOC, and other ASG agencies to understand what is currently being farmed and used for family consumption, thereby ensuring food security for the island and what lands are available for intensification of commercial export. The existing taro cultivation is currently being done on communal lands and the communities must identify human resources that exist on island to commit to agricultural intensification programs.

The work in Aunu'u is in progress and there is much to be done, but a great deal has already been accomplished with the partnerships in Aunu'u and amongst ASG agencies. Sustainable economic development projects must be pursued with the village council in order to solve these challenges. This ASG partnership with the Aunu'u village focusing on economic and land development has quickly materialized into realistic yet constructive dialogue of what is possible in Aunu'u.

Source: American Samoa Department of Commerce [Press Release to Samoan News](#) of December 8, 2013, published on Monday December 9, 2013 at page 7.



## **Introduction**

A place base management is the approach of this study toward village planning and ordinance design. It is an honor and a privilege to collaborate with the Council and the people of Aunu'u.

1. Planning Division of the Department of Commerce to discuss with the Office of Samoan Affairs (OSA) - going to Aunu'u to see what the Village Council wants in terms of development.
2. Important to discuss with the village council the concept of the project, receive blessing/approval prior to going to that island.
3. Place-based management in looking at zoning, risk, disaster management/mitigation. The process somehow molds these two aspects as to what the community feels are the needs and the opportunities.
4. Develop the regulations/ordinances from these village-based dialogue.
5. Develop economic opportunities from this development dialogue.
6. It is important is to go to Aunu'u early on to talk to the village council.
7. It is possible to utilize members of the community that have experience in place-based management and participatory approaches.
8. Develop conceptual models of the village planning process and design and regulatory outputs of this project (within the scope of the Office of Insular Affairs (OIA) grant.

This white paper proposes a participatory approach to village planning acceptable to the people of the island of Aunu'u. It recognizes the traditional social system and the historical, cultural and archaeological assets of Aunu'u. It suggests that the land utilization of the past can be a useful benchmark for customary practices and carrying capacity. The demographic description is needed to study the development plan proposal formulated by the Aunu'u Village Council for feasibility and implementation. Ocean, land, natural, and cultural resources, as well as natural hazards, give the context for planning and design. The current status of infrastructures and facilities gives direction to future plans and clarifies needed improvements.

The Aunu'u Village Council and the Territorial agencies pave the way for collaboration that materializes when the parties produce the necessary data, information, and deliberations over the next several months.

This white paper is the necessary reconnaissance and a scoping for planning the future of Aunu'u. Aunu'u leaders and people must augment this report with their own knowledge. Participatory data collection forms are included. Facilitators can help using them. This preliminary document provides an attractive land utilization and zonation for the island of Aunu'u that, when formally adopted as a plan and as a zoning ordinance will pay the way to secure the needed economic development programs and projects because their justification will be apparent from the plan for Aunu'u Village. A parallel paper by the same authors explores possible village planning processes for other villages in the Territory.

## HISTORICAL & CULTURAL

### Political and Administrative History and Fa'alupega of the Aunu'u Island

Aunu'u is an island, but it is not politically isolated. Some sections of this island were part of the District of Saole. Moreover Aunu'u was the seat of this district government, as Augustino Kramer (1901) explains, the administrative and political set up was such that Aunu'u was made up of three little villages Saluavatia, Leauuliuli and Afasau, but that they had different political associations with the South East coast of Tutuila because Alofau and Amouli villages on Tutuila were considered hamlets of Aunu'u.

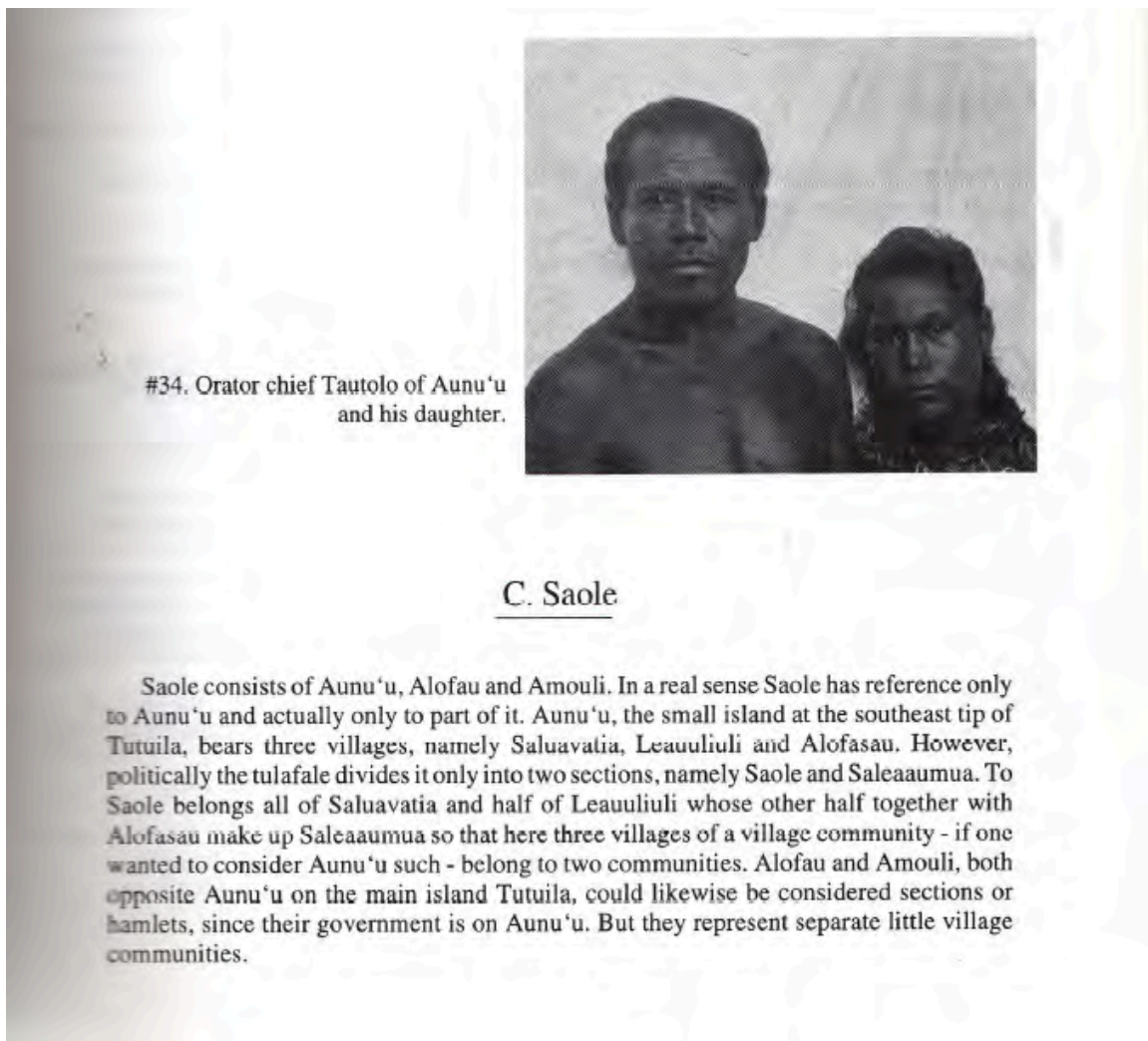


Fig. 1 Description of the political and administrative link of Aunu'u Island to the District of Saole in the year 1900 (Kramer, 1994)

This political relation between Aunu'u and the South East Coast of Tutuila opposite from this island appears also on the Fa'alupega of Saole that greets the two

principal orators of Saole who actually lived on the Island of Aunu'u. The fa'alupega was the ceremonial style of address of a person or social group traditionally associated with certain areas.

434		TUTUILA
<b>'O le ao tetele o Saole</b>		<b>The Great Honours of Saole</b>
Tulouna 'oe le Saole	Greeted you Saole	the faleupolu. Meaning the whole district, respectively the corresponding Aunu'u half as the government of the whole.
tulouna lau afioga Faumuinā	greeted your highness Faumuinā	Aunu'u.
tulouna 'oe āiga	greeted you āiga	meaning Alofa as a whole.
tulouna a lupega Lutali ma Lemafa	greeted your mightiness Lutali and Lemafa	Aunu'u.
tulouna a lau tofā Taufi ma Fuiava	greeted your venerable highnesses Taufi and Fuiava	the two principal orators for Saole, living in Aunu'u.
tulouna 'oe Saleaamua.	greeted you Saleaamua.	the other half of Aunu'u which supports Saole in government.

Fig. 2 Fa'alupega of the District of Saole referring to Aunu'u Island (Kramer, 1994)

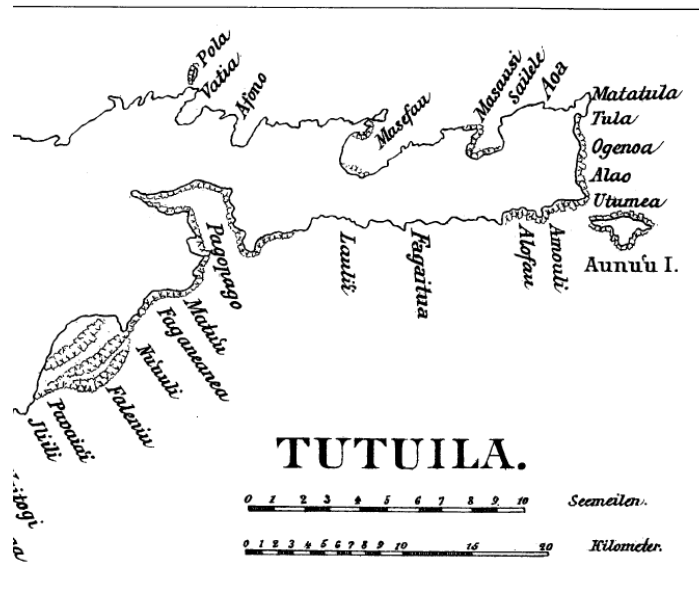


Fig 3. Tutuila Map (Aunu'u side) A. Kramer Circa 1900 with names of the East coast villages of Tutuila

The Fa'alupega of Aunu'u also refers to the three villages on the islands and the respective chiefly families there.

### 10. Aunu'u

consisting of three hamlets Saluavatia, Leauuliuli and Alofasau. See the story of the mosquitoes there, c, 16; see also VI, c, 9 about Osogavasa, Puava and Fagalele.

Tulouna 'oe le Saole	Greeted you Saole	Saole consists of the orators of Saluavatia and half of Leauuliuli.
ma Saleaaumua	and Saleaaumua	Saleaaumua consists of Alofasau and half of Leauuliuli.
[tulouna 'oe le Saole	greeted you Saole]	not normally repeated.
tulouna 'oulua lupega a Lutali ma Lemafa	greeted you two honoured Lutali and Lemafa	two powerful chiefs of the Saole; here lupega for tofā.
tulouna lau tofā a Taufi ma Fuiava	greeted your venerable highnesses Taufi and Fuiava	Taufi and Fuiava are the most powerful orators of the district, they live in Saluavatia, they made the island arable (VI, c, 9).
tulouna 'oe Saleaaumua	greeted Saleaaumua	see above. Also the name of the capital of Aleipata (p. 365).
tulouna Matila ma Lauvao	greeted Matila and Lauvao	tulafale of Alofasau.
ma lau tofā a Tautolo	and your venerable highness Tautolo	my informant, living in Alofasau. Cf. Tautolo in Aleipata p. 364.

tulouna lau afioga a Faumuinā.	greeted your highness Faumuinā.	see Tuiaana line IV, A, b, 2, gen 24 (p. 225). There are also Faumuinā chiefs in Faleata (p. 294).
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Fig. 4. Fa'alupega of Aunu'u Island (Kramer 1994)

The implication in village planning is to remember this history and pay attention of how the old micro division might have or not a meaning for the understanding of the contemporary Aunu'u single-village of today.

The American Samoa Housing of Representative District boundaries still maintain the link of Aunu'u Island with South-East Tutuila because the Representatives of District No. 4, who lives on Aunu'u, represent the people of Aunu'u, Amouli, Utumea, and Alofao, continuing a century old administrative

arrangement. The Planning District No. 3 instead encompasses an even larger area inclusive of District No. 5 of Sua and of the District No. 4 of Saole

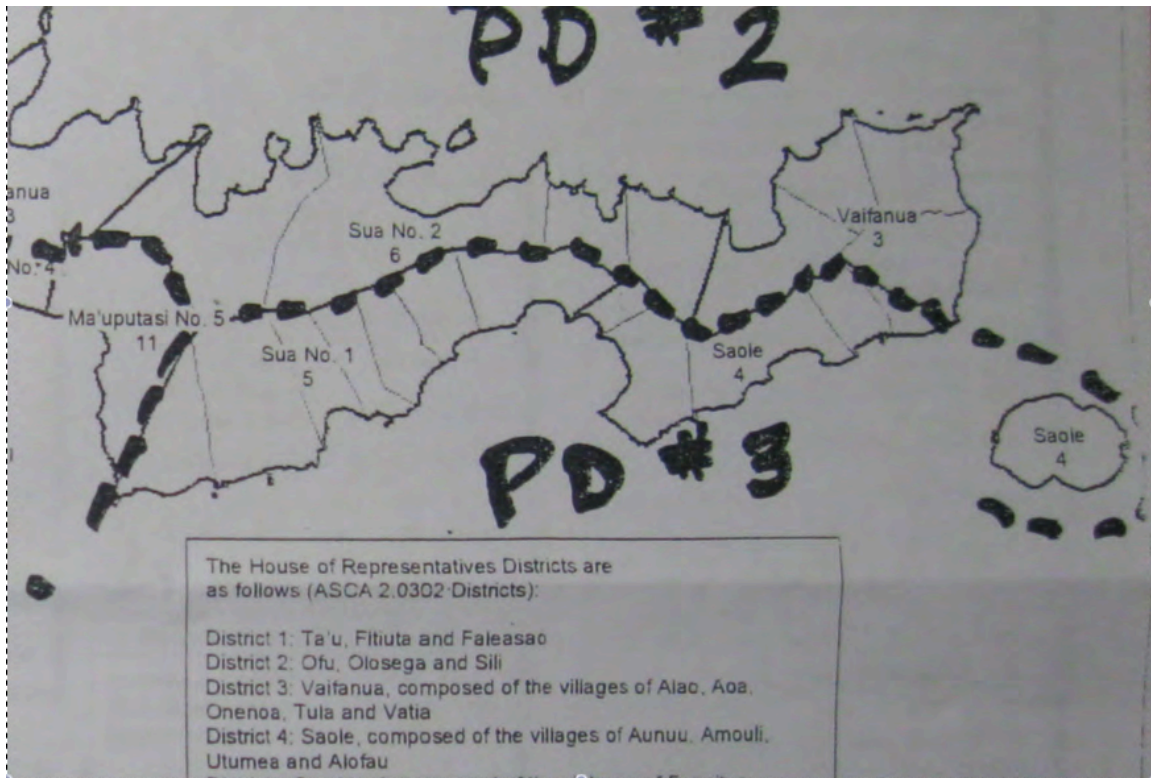


Fig. 5 Contemporary House of Representative Districts and Planning District in South-East Tutuila inclusive of Aunu'u Islands

Reference: Augustino Kramer. 1994. The Samoan Islands. Vol. 1, Honolulu: University Press.

### **Aunu'u Island Surface Archaeological Sites, History and Legends**

The island of Aunu'u has a single village. It is fronted by a low, shallow fringing reef which has a single canoe passage. Wells are the only source of water. The island is part of a volcanic cinder cone, and the western side of the island is composed almost entirely of thick, coral detritus, deposited by marine winds, which has formed a level shelf about one-half mile long at its greatest width. This shelf of coral and decomposed cinders is the base of the village site. The following are the sub-areas and malae of the village of Aunu'u.

- Alofasau
- Le'au'uli'uli
- Saluavatia
- Malaefono (malae)

## Defense Wall

Aunu'u: The only village in American Samoa that has a documented pa taua, or war defense wall, is on the island of that name. A-2. 18 Now in ruins the wall, with its two towers, pu'e, one at each end, faced the sea and was 6 feet high along its entire length. The towers, built of loose stones, are said to have been 20 feet high, and formed a raised platform. Between the wall and the water's edge warriors would set sharpened stakes into the sand to prevent a frontal assault on the village. Traces of the wall can still be seen 50 to 60 feet from the high water mark.

A chief of Aunu'u gave an account of the use of this pa taua. During the political division of Tutuila there was unrest, within the eastern district as to the legality of Chief Lei'ato as district governor. The faction for Lei'ato fought a running battle with the opposing faction and caused the enemy to flee to the Pago Pago area of Tutuila. There they obtained passage to Aunu'u Island and received 'permission to land there. They were accorded protection by the village.

The village built towers and strengthened the existing wall. "Two sailors, deserters from the Hawaiian ship Kaimiloa, with the aid of another Hawaiians, had the four cannons from the Kaimiloa propped on the towers. The villager expected a battle with invaders making an assault on the village. Many weapons such as rifles and cannons traded from the Kaimiloa were readied. When the fleet approached the island the gunners fired on it causing great havoc in the ranks. The canoes were blown out of the water and their crews were killed by rifle and cannon fire. The defeat led to the isolation of the forces on Aunu'u Island. There is another reference on Kaimiloa, American Samoa Maritime Heritage by Hans Van Tilburg found here, [http://americansamoa.noaa.gov/pdfs/as\\_heritage.pdf](http://americansamoa.noaa.gov/pdfs/as_heritage.pdf) that mentions a sunken whaler, but not near Aunu'u. This reference also contains the following: The Cannon of the Kaimiloa: In 1887 the Prime Minister of the Hawaiian Kingdom Walter Murray Gibson, armed and fitted out a used guano steamer, renamed the Kaimiloa, as King Kalakaua's warship, and sent her to Samoa as a national display of power. The effort was plagued by several mutinies on board the poorly run ship, and the very real resistance by Germany, displeased with another power attempting to influence affairs. At an unscheduled stop in Pago Pago harbor the Kaimiloa's crew traded the ship's four cannon for pigs. Three of these cannon were later used by the inhabitants of Aunu'u Island (with the aid of sailors from the ship) to repel an invasion canoe fleet. These three are now mounted on replica naval carriages and on display at the Jean B. Aydon Museum. (pages 34-35)



*One of the iron cannon from the HMS Kaimiloa, flagship of the Hawaiian Kingdom. (NOAA ONMS)*

**Fig. 6 Iron Cannon from HMS Kaimiloa**

Defensive walls ('olo or fa taua). Many of the villages in olden days had stone walls built around them to assist in keeping out attacking war parties. For such purposes, the wall was called a pa toua or 'olo, though 'olo usually refers to the village or place thus fortified. Such a wall in ancient days was built around Leone on the landward side, but the seaside was left open.

The village on Aunu'u Island was extensively defended during the war between Faumuina and Maunga of Pago Pago. The wall was about 6 feet high and ran along the sea front. The right flank ended in a loosely built stone tower protected by the main village and a large body of men. The left flank also ended in a stone tower. The right tower, now nothing but a heap of stones, was said to have been originally 20 feet high. The tower, termed pu'e consisted merely of a raised platform of loose stones. On these sentries were posted in wartime. Behind the flanks, the coast was rough and prevented the landing of canoes; hence the back of the village needed no artificial defense.

Traces of the wall are still to be seen about 60 feet back from high water mark, but most of the stone material had been removed to build a pig wall. Between the wall and the water edge, a number of wooden sharp points were set closely together and firmly imbedded in the sand. This prevented direct frontal rushes by people landing from canoes.

## **Wells**

The wells of American Samoa " are unusual in that not one has any known relation to any legend or tradition. Wells were seen in areas without springs and streams. Eastern Tutuila, Aunu'u Island, and some parts of Manu'a have wells, with brackish water that are still in use.

On the island of Aunu'u, there are several wells of the same general type seen on Tutuila except that steps are absent because of the shallow depth of the wells. One well, A-3, entirely constructed of coral pebbles and slabs, is 12 feet in diameter and is ringed by a pavement of coral pebbles around a shaft with a diameter of 4.5

feet. The well, 5 feet deep, is set into the sand coral detritus bank of a shore that extends for half a mile from the beach into the bush (Fig. 23)



Fig. 7 Aunu'u Well A-3

### **Tupua Stones**

The island of Aunu'u, a mile away from the eastern tip of Tutuila has four tupua stones. The first two, large boulders are located near the eastern opening of the crater of Aunu'u where the swamp waters drain into 'the ocean, acre, according to Samoan informants, the bodies of Sina and Tigilau, the traditional lovers in Samoan legends, site A4.

The other two stones which are boulders of volcanic ash on the top of the crater's rim, are called Teine' and Taunu'u, for two females who were changed to stone, site A-5. An informant gave this story: The two demigod sisters, Taema and Tina (Tilafaiga) were swimming from Upolu to Manu'a when they came upon Aunu'u Island. They saw two girls sitting on the crater' s rim and called to them. They asked if they could stop and rest there; the two girls, also sisters, replied that they would be welcomed and treated with great respect. These two girls, Teine and Taunu'u, cared for and fed their two guests. The two demigods were pleased with the kind treatment received from the sisters and decided to give them a present. The present was a coconut water bottle that was tightly covered. The demigod asked that they not open the bottle until the two were out of sight. The two sisters did as they were told and as soon as they opened the bowl it broke into a thousand pieces, and a huge swarm of mosquitos came out and stung the two sisters. The cruel joke by the demigods caused the two sisters such great pain that they turned to stone at the exact spot where they broke the bowl. To this day the great: swarm of mosquito is quite evident on Aunu'u.



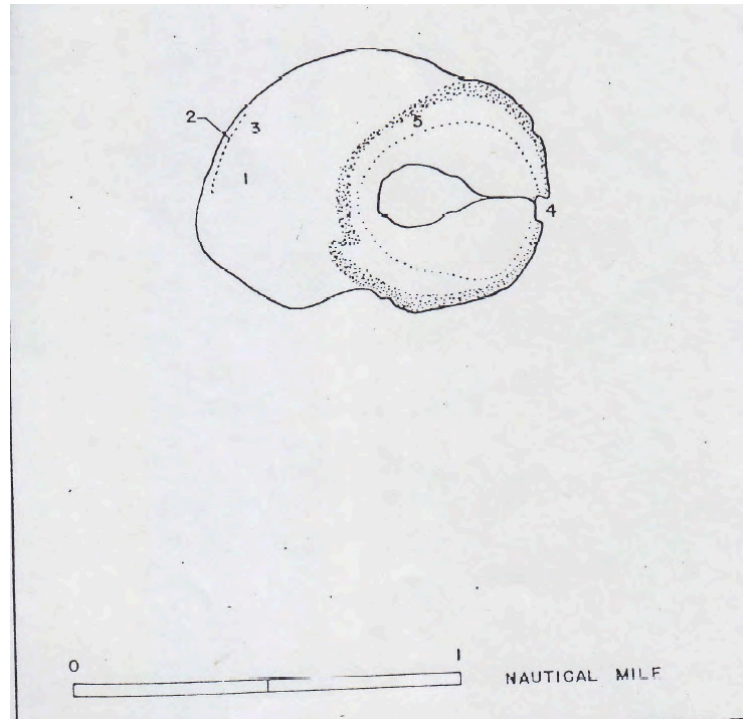


Fig. 8 Aunu'u Map Archaeological and Legendary Sites (Source: Kikuchi 1963)

Legend:

- A1 Village,
- A2 War Stone Wall,
- A 3 Well,
- A4 Sina and Tigilau, the traditional lovers
- A5 Teine and Taunu'u, two sisters changed in stone

Comments:

Aunu'u Island is an evocative and interesting storied place with connection to American Samoa politics and warfare as well as a link to Hawaiians during the Hawaiian Kingdom in 1887, as well as legends that give meaning and sense of sites on the islands. When properly narrated it can inform and inspire residents and visitors alike.

**Commemorative Heaps.**

The people often visited some hilltop or other on a walking trip or malanga. To mark the occasion, stones were carried up or collected in the vicinity and piled in a heap. Some of these heaps may be seen in places where the stones did not occur in nature but were obviously carried by human agency. Mr. Judd remarked this on the

large hill in Tutuila called Olomoana. The Chief Faumuina of Aunu'u Island said that the hill was often visited by his ali'i predecessors for the sake of the view.

The guard (soatau) took stones up on each occasion and piled them in a heap. They served not only as a memento of the visits but could be used as sling stones and throwing stones if they were suddenly attacked while there. Where people of a different culture commemorate a visit by carving their names on rocks and cliffs or defacing historic objects, the Polynesian made a cairn of stones.

Reference: William Kenji Kikuchi. June 1963. Archaeological Surface Ruins in America Samoa. University of Hawaii. Master Thesis, Department of Anthropology.  
Silva, Thomas E. 1975. Archaeological Reconnaissance Survey proposed shoreline and highway improvements, Tutuila Island and Aunu'u boat harbor. Lawai HI. Archaeological Research Center  
Te Rangi Hiroa (P.H. Buck). 1930. Samoan Material Culture Honolulu: Bernice Bishop Museum. Bulletin No. 75.

### **Maritime Heritage Sites**

A report on Maritime Heritage Sites by Tilburg (June 2007) shows a map with three sites off Aunu'u Island. Additional information is needed to learn what they actually are and what importance they have for the culture, history and tourism of this island. They may include shipwrecks, coastal fortification and archaeological sites.



Fig. 9 Maritime Heritage near Aunu'u  
 References: Van Tilburg, Hans. June 2007. American Samoa Maritime Heritage Inventory. NOAA Pacific Island Regional Office,

### Aunu'u Island Storied Sites

Aunu'u Island has unique stories associated to cultural resources that Samoans remember: A coconut tree could only be climbed with one's eyes closed. The villagers name the tree "niu a'e moe" - meaning the coconut that is climbed with eyes closed. The tree leans over the Pacific Ocean about a couple of hundred yards on sheer cliff face that drops into the blue ocean. So the belief is, if one dares to climb the tree, the only way one can make it to the top and back down is if the eyes are closed. This tree was still standing in the early 1970s. The "vai sua toto," which translates into blood colored water, is the brackish lake in inside the crater. There is quicksand in the crater also.

Aunu'u is known for their solid, delicious wetland taro, which is called "talo tautufusi," the latter word meaning wetland. People always talk about a special dish called "fa'ausi" which is made with this taro.

There is also a formation on coastal rock that local legend believes are the mythological lovers Sina and Tigilau. Near this formation there is a rock formation which the villagers called "boiling kettle" - when sand is poured into the rock formation, it spews the sand out; the pressure from the waves blows out the sand.

Current development issues are school facilities, health facility, reliable transportation, including facilities, water, power, wastewater, solid-waste, and even hazardous waste disposal. There is also the real threat from natural disasters. Source: Herman Tuiolosega, personal communication, November 2013.

### **Land Utilization in 1930**

Coulter describes the land utilization in American Samoa around 1937 and provides several references to Aunu'u and in particular to the taro cultivation there:

Coulter Aunuu Island lies 1,500 yards south of the eastern end of Tutuila; it is elliptical along an east-west axis 1,800 yards long. It is 1,300 yards from north to south. The eastern half is a crater, the rim of which is 200 feet high, and the northwestern half is flat.... The crater of Aunuu encloses a pond.... Most of the soil of Aunuu is muck from the decomposed volcanic material and contains a large amount of organic matter.... The small island of Aunuu has almost no natural forest; the taro plantations there are in swamp lands. The varieties cultivated in the swamp on Aunuu are similar to those raised elsewhere in American Samoa.... In swamp lands, taro beds are elevated by building up the mucky soil and draining the ground through canals. On the island of Aunuu the swamp taro can be harvested and used after four months, but it is best after five or six months. When the tops are planted, coconut leaves are spread about them on the ground to inhibit weeds. The land is cropped continuously.... On the island of Aunuu, mat making is more important than the production of copra. Coconut trees have been cut down to make room for pandanus. The largest contiguous area which I saw used for pandanus was on Aunuu about 0.1 acre.... The village of Aunuu has a church, the materials and skilled labor for which cost \$28,000.00. It was paid for by money from the sale of mats and copra.

This description by Coulter, a geographer, evidences the importance of taro cultivation, coconut, and pandanus, not just for subsistence use, but also for map making and sale. He explains how wet taro is raised in Aunu'u. Coulter's map provides a population count of the 1935 Census indicating a total of 275 persons in Aunu'u (one small dot on the map corresponds to 25 people). This village population is comparable to the one of villages back then like Aua, Vaitogi or Fagasa, but it is about only 63% of the 2010 population level of 436 in Aunu'u.

Reference: Coulter, John Wesley. 1941. Land Utilization in American Samoa. Honolulu: Bernice P. Bishop Museum. Kraus Reprint Co. New York. 1971.

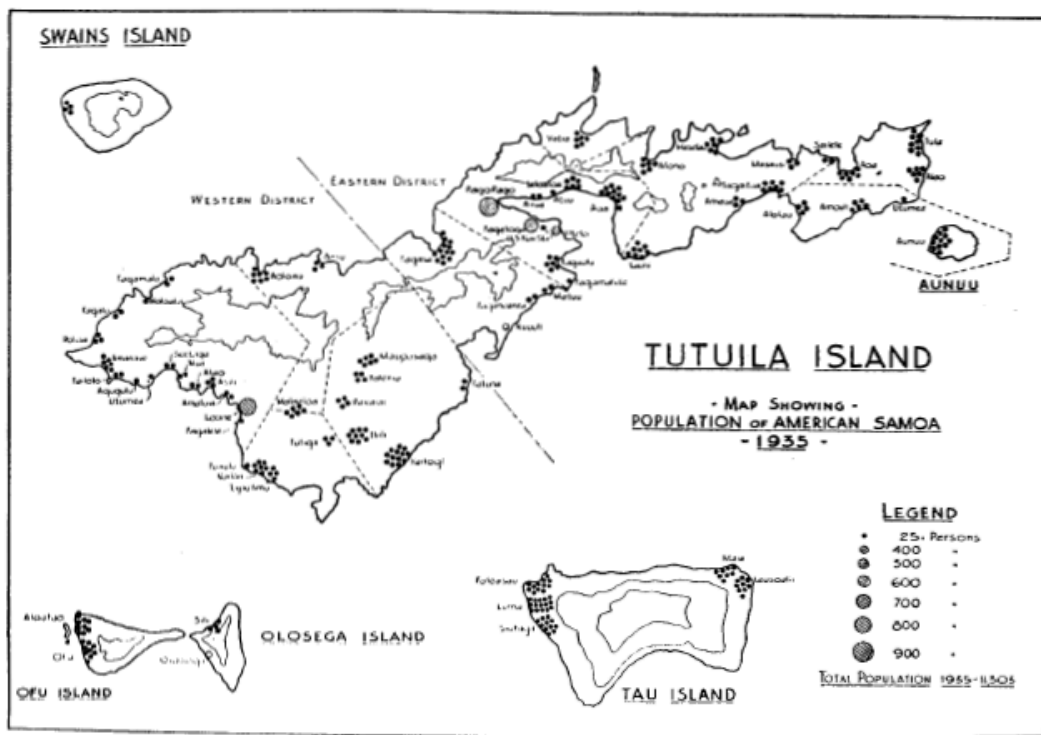
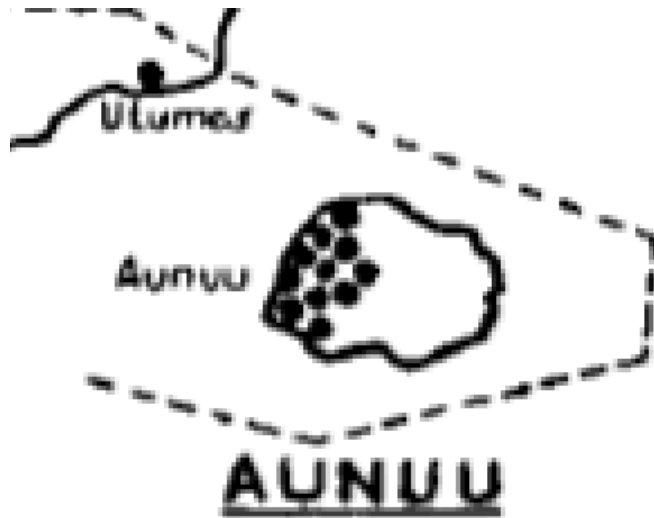


FIGURE 7.—Map showing distribution of population in 1935.

Fig 10 & Fig. 11 Population Map in Aunu'u in the American Samoa Census of 1935 depicts 11 dots of 25 people each total 275 persons (Coulter, 1941)

## **SOCIAL & ECONOMIC**

### **Aunu'u Island Population Demographic Characteristics - a Summary**

#### Total Population, Ethnicity, Race

The population of Aunu'u has been rather stable over 40 years (2010-1970) to just above 400 people, but it declined little, -8% between the years 2010 and 2000. Of the total 2010 population of 436 persons, 99% were Samoans, indicating a high degree of ethnic and racial origin and social cohesion.

#### Gender and Age Distribution

In 2000 the gender distribution was balanced, all 5 years age groups male and female are rather equally represented in each group, but the number of people decline after the year 55, indicating in Aunu'u a bulk of young and labor force age people with median age of 20.1, a number very close to the one for A. Samoa.

In 2010 the population distribution by age was also rather balanced among the group but with the groups year 55 old and above, the numbers sharply decrease, indicating that children, the young, and those in labor-force age make the bulk of the population. Out of a total 436 persons, 221 were male, or 50.7%, and 215 were female, or 49.3%. The median age was 20.6 years, 19.3 years old for male and 22.2 female, indicating a predominantly young population in Aunu'u.

#### Fertility

Ninety-five women, between 15 and 44 years of age, had 151 children ever born (aggregate) in 2010.

#### School Enrollment and Educational Attainment

In 2000 the bulk of school enrollment was at the elementary level (1-8) and the HS graduate made up 42.7 % of the population in Aunu'u, somewhat less than the one of American Samoa at 66.1%.

In 2010 from a population 25 years and older of 193 persons, 55.5% were high school graduates and 20.7% had same college education or college degrees, while 23.8% had less than 9<sup>th</sup> grade or 9<sup>th</sup> to 12<sup>th</sup> grade, but no diploma. Those with a BA or higher were 5.7% and 76.2% had High school graduation or higher.

In 2010 out of a total population of 158 of 3 years and older enrolled in school, 13 were in Pre-kindergarten, 10 in Kindergarten, 82 in Elementary, 41 in High School and 12 in College, graduate or professional school. Out of population of 261 who were 16 years and over, 27 persons or 10.4% completed requirements for professional training in American Samoa or outside, while 234 or 89.6% did not, indicating opportunity for additional training programs for Aunu'u.

#### Housing

On average, in the year 2000 there were 6 persons per occupied housing units, consistent with American Samoan relatively large household size. In 2010 the average household size per housing unit was a close to it, or 5.74, and the average family size 5.89. Of the 76 occupied housing units 35 had 1.00 or less occupants per

room, 18 had 1.01 to 1.50 occupants per room and 23 had 1.51 or more occupants per room.

### Place of Work

In the year 2000 among the 96 workers 16 years and over, 31 persons (32.3%) worked in the same county and 65 (67.7%) in a different county indicating that a majority of jobs required commuting away from the island.

In the year 2010 of the 126 total work force 16 years and over, 125 persons, or the large majority, worked in American Samoa and also in the same district, only 2 worked outside their districts, and only one outside American Samoa.

Note: that these two sets of data are not comparable because the 2000 census uses “county” and the 2010 uses “district”.

### Household Characteristics

In the year 2010, 14 households were with individuals 65 year old and over, while 61 households were with individuals under 18 years of age indicating a majority of households with youth and very young children. Out of a total of 76 households, 72 or 94.7% were family-households, indicating in Aunu’u a preponderance of families, of which 43 families with own-children under 18 years of age. Fourteen female householders had no husband present and 7 male householders had no wife present. Only four or 5.2% were the household living alone. With a total population of 436 persons, 76 were householders, 51 spouses, with a total of 177 children of which 117 under 18 years of age, and 39 between 18 to 26 years of age.

### Poverty Level

In 1999, fifty-six families or 76% were in poverty with about 76% of them with related children. In the same year 61% of all people lived in poverty in American Samoa, a rate five times higher than the continental US poverty rate of 12% (Chung, September 2012, p. 35). In 2009, two hundred and seventy people were with income below the poverty line; this accounts for a majority of 61.9% of the 2010 population of Aunu’u Island.

### Median Earning

Of the population 16 years and over, with earnings in 2009, the males made \$11,750 working full time, year-round and the females \$12,188.

### Employment Status

In 2010 of the population 16 years and over of 261 persons, 129 were in the labor force or 49.4%; and 132 not in the labor force or 50.6%. Of those employed 31 persons also did subsistence activity, two were unemployed, and one was in the Armed Forces. Only six people, or 2.3%, were engaged in subsistence activity. Given that the percentage of people above labor force age on Aunu’u is small to have about 51% of its population without a job indicate the need for community economic development and more jobs opportunities in this island.

### Household Income

In 2009 the household income of the 76 households in Aunu'u was distributed as follows: 33% of the household had income between \$2,500 (and less) to \$14,999; twenty-six percent between \$15,000-\$29,999; twenty-five percent between \$30,000- \$49,999; sixteen percent between \$50,000-\$74,000, and none with income above \$75,000. Given than more of one person may work in a household, this aggregate household income would indicate the need for more jobs and better-paying jobs. As comparison, the weighted average poverty threshold in 2012 for a family of four people in the USA was \$23,492, and for a family of six people \$31,471 (US Census 2013 web page retrieved Nov 20, 2013)

#### Sources:

American Samoa Statistical Yearbook 2007 and 2011.

American Samoa DOC, Leifiloa Tanoi, Line Kruse.

Chung Margareth. September 2012. American Samoa Population Situation Analysis. PSA Report.

U.S. Census Bureau, 2010 Census American Samoa. Demographic Profile.

### **Population Statistics Village of Aunu'u Year 2010**

**Source: US Bureau of The Census 2010**

#### POPULATION BY GENDER YEAR 2010

Village	Number Total	Number Males	Number Females	Percent Total	Percent Males	Percent Females	Males per 100 Females
Aunu'u	436	221	215	100.0	50.7	49.3	102.8
A.Samoa	55,519	28,170	27,349	100.0	100.0	100.0	103

#### VILLAGE POPULATION BY AGE - YEAR 2010

Village	Under 5	5-9	10-14	15-19	20-24	25-34
Aunu'u	57	58	49	49	30	57
A.Samoa	6,611	6,535	6,279	6,297	3,890	6,831

#### VILLAGE POPULATION BY AGE - YEAR 2010 (Cont.)

Village	35-44	45-54	55-59	60-64	65-74	75-84	85+
Aunu'u	41	52	16	10	10	6	1
A.Samoa	7,206	6,065	2,057	1,481	1,610	547	110



SCHOOL ENROLLMENT BY LEVEL OF SCHOOL – YEAR 2010

Island Area: American Samoa	
Geographic Name: Aunu'u village	
<i>Table Number: AS15</i>	
SCHOOL ENROLLMENT	
Universe: Population 3 years and over enrolled in school	
Total:	158
Pre-kindergarten	13
Kindergarten	10
Elementary school (grades 1-8)	82
High school (grades 9-12)	41
College, graduate or professional school	12

EDUCATIONAL ATTAINMENT BY LEVEL – YEAR 2010

Island Area: American Samoa	
Geographic Name: Aunu'u village	
<i>Table Number: AS16</i>	
EDUCATIONAL ATTAINMENT	
Universe: Population 25 years and over	
Total:	193
Less than 9th grade	18
9th to 12th grade, no diploma	28
High school graduate (includes equivalency)	107
Some college, no degree	19
Associate's degree	10
Bachelor's degree	5
Graduate or professional degree	6

POPULATION WITH INCOME IN 2009 BELOW POVERTY LEVEL – YEAR 2010

Island Area: American Samoa	
Geographic Name: Aunu'u village	
<i>Table Number: AS81</i>	
POPULATION WITH INCOME IN 2009 BELOW POVERTY LEVEL	
Universe: Population for whom poverty status is determined with income in 2009 below poverty level	
Total	2 70

MEDIAN EARNINGS IN 2009 (DOLLARS) BY SEX BY WORK EXPERIENCE IN 2009 – YEAR 2010

Island Area: American Samoa	
Geographic Name: Aunu'u village	
<i>Table Number: AS69</i>	
MEDIAN EARNINGS IN 2009 (DOLLARS) BY SEX BY WORK EXPERIENCE IN 2009	
Universe: Population 16 years and over with earnings in 2009	
Median earnings in 2009 —	
Male full-time, year-round worker (dollars)	11,750
Female full-time, year-round worker (dollars)	12,188

EMPLOYMENT STATUS AND SUBSISTENCE ACTIVITY – YEAR 2010

Island Area: American Samoa	
Geographic Name: Aunu'u village	
<i>Table Number: AS38</i>	
EMPLOYMENT STATUS AND SUBSISTENCE ACTIVITY	
Universe: Population 16 years and over	
Total:	261
In labor force:	129
Civilian:	128
Employed:	126
Also did subsistence activity	31
Unemployed	2
Armed Forces	1
Not in labor force:	132
Subsistence activity only	6

HOUSEHOLD INCOME IN 2009 – YEAR 2010

Island Area: American Samoa

Geographic Name: Aunu'u village

Table Number: AS51

HOUSEHOLD INCOME IN 2009

Universe: Households

Total:

76

Income Range in US \$	Percentages
Less than \$2,500 to \$14,999	33%
\$15,000 to \$29,000	26%
\$30,000 to \$49,999	25%
\$50,000 to \$74,000	16%
Total	100%

## **Aunu'u Economic Development Plan Submitted by Aunu'u Faipule**

### Aunu'u finest natural resources:

1. **Taro:** Selling taro and making (faausi) were the two main source of money making for Aunu'u people for the last fifty years. It was a normal activity for the young men and women to spent most of their morning and early evening at their taro plantation. Almost every family had two or more taro plantation at the time. Aunu'u still has great amount of land for growing taro that can supply to Tutuila for various purposes. The two major challenges is the decline motivation for young men and women to work on the taro plantation and the (fau tree) invasion on the taro plantation. It is becoming a major issue for the future of taro plantation in Aunu'u.

2. **Tilapia:** Tilapia was one of the main dishes for the Island people for the last fifty years. Tilapia can only be fish at the Red lake (vaisuatoto). Building a fish farm could be a significant idea of utilizing Tilapia for making money to support families and necessary measures for the benefit of the Island.

3. **Fine mat leaves (laufala):** Selling fine mats was one of the main source of income for the Island people for the last fifty years. A lot of fine mats are sold for church opening and guests house ceremony (faaulufalega). The major challenge is that not so many young women have the motivation to weave fine mats these days. Also the fine mat leaves or (laufala) is slowly disappearing.

4. **Coconut, Mango, Orange (Samoan moli), Pineapple, banana, peas, cucumber, pumpkin:** Aunu'u has a lot of dry coconut that is not being develop for any productive activity of money making. The fruits and vegetables mentioned above are highly needed by Aunu'u farmers for their plantations.

5. **Beach Resort:** (conference)

6. **Tourism:** Quick sand, Red Lake, Sina and Tigilau cove, etc.

## **Aunu'u Improvement Plan**

### Aunu'u needs:

- Elementary school van.
- Passenger vessel.
- Health clinic.
- Cement road around the whole Island.
- Power House.
- Sea wall.

- New Wharf.
- Helicopter (emergency)
- Rescue boat
- Police and fire station
- Library

## Preliminary Scoping of the Aunu'u Economic Development Plan

The table below takes into consideration the issue raised by the Aunu'u Village Council and the above submittal to DOC by the Faipule of Aunu'u and explores possible project, information needed, pertinent actions, as well as possible partners for a next step.

<b><u>Aunu'u Finest Natural Resources:</u></b>	<b>Discussion</b>	<b>Action &amp; Partners</b>
<p>1. <b>Taro:</b> Selling taro and making (faausi) were the two main source of money making for Aunu'u people for the last fifty years. It was a normal activity for the young men and women to spent most of their morning and early evening at their taro plantation. Almost every family had two or more taro plantation at the time. Aunu'u still has great amount of land for growing taro that can supply to Tutuila for various purposes. The two major challenges is the decline motivation for young men and women to work on the taro plantation and the (fau tree) invasion on the taro plantation. It is becoming a major issue for the future of taro plantation in Aunu'u.</p>	<p>There is much acreage in the taro marsh area with no trees that are not cultivated.</p> <p>Taro Food demand for family consumption can be calculated.</p> <p>Taro surplus for sale can be calculated.</p> <p>Establish material &amp; equipment needed for the added taro production including processing, packaging, labeling, transportation.</p> <p>Need to survey who is currently able farmer and who might be future farmers among the youth and need for support, training, education.</p> <p>Undertake a weed and Fau tree control of infestation of the wetland.</p> <p>It is reported that water quality and amount has changed over the year</p>	<ul style="list-style-type: none"> <li>* DOC Survey &amp; GIS Mapping of wetland acreage actually cultivated from the one non-cultivated, fallows or abandoned.</li> <li>• Village Council and DOC Survey and GIS map the family ownership (land tenure) in Aunu'u including the taro patches (plot family names).</li> <li>• Village Council and DOC conduct a Labor Force survey of Aunu'u families for training and interest in farming and processing taro and other crops.</li> <li>• DOC help to create business plan &amp; feasibility study for increased taro production –link with Samoans abroad to do marketing and distribution (US, Canada, Australia, etc.).</li> <li>• DOC and DOA collaborate on taro and tree crop production intensification, manpower, technical assistance &amp; marketing.</li> <li>• Involve DOA to undertake Fau tree removal and weed management project – Link to manpower training.</li> <li>• ASPA conduct or promote scientific hydrological research with suitable</li> </ul>

	<p>possibly due to sea level rising, climate and tsunami events.</p> <p>It is reported that the taste, shape, texture and quality of taro has changed in the last several years.</p> <p>Consider taro processing as baby food for children allergic to conventional baby food.</p> <p>Consider making taro chips, taro food basket for restaurants and hotels.</p>	<p>universities like water research center of UH on water changes</p> <ul style="list-style-type: none"> <li>• Conduct scientific research on taro via DOA, ASCC, UH College of Tropical Agriculture and Human Resources and similar institutions regarding taro disease, mutation and type.</li> <li>• DOC establishes access to commercial kitchen that can meet health standards for marketing and sale of taro, or possibly build one in Aunu'u.</li> </ul>
<p><b>2. Tilapia:</b> Tilapia was one of the main dishes for the Island people for the last fifty years. Tilapia can only be fish at the Red lake (vaisuatoto). Building a fish farm could be a significant idea of utilizing Tilapia for making money to support families and necessary measures for the benefit of the Island.</p>	<p>Tilapia cultivation can provide fish food for families and the surplus can be sold train interested people in fish farming.</p> <p>Remove open dump from the crater Study alternative waste disposal look at JAICA work in Palau.</p>	<ul style="list-style-type: none"> <li>• DOC consult with aquaculture specialist at ASCC and UH Manoa Aquaculture Coordinator for training and extension service support.</li> <li>* Involve ASPA &amp; EPA in alternative waste disposal project. Seek SPREP technical assistance.</li> </ul>
<p><b>3. Fine mat leaves (laufala):</b> Selling fine mats was one of the main source of income for the Island people for the last fifty years. A lot of fine mats are sold for church opening and guests house ceremony (faaulufalega). The major challenge is that not so many young women have the motivation to weave fine mats</p>	<p>Meet with Laufala expert and then reach out to survey under which condition additional women would expand production, determine availability of material to use, work places, storage</p>	<ul style="list-style-type: none"> <li>* Organize women in family team to produce Laufala fine mats DOC assist in storage, transportation and marketing and obtain agricultural inspections certificate to safe export to US and abroad.</li> </ul>

<p>these days. Also the fine mat leaves or (laufala) is slowly disappearing.</p>		
<p><b>4. Coconut, Mango, Orange (Samoan moli), Pineapple, banana, peas, cucumber, pumpkin:</b> Aunu'u has a lot of dry coconut that is not being develop for any productive activity of money making. The fruits and vegetables mentioned above are highly needed by Aunu'u farmers for their plantations.</p>		
<p><b>5. Beach Resort:</b> (conference)</p>		

Suggested Next Step: please present the above table to Aunu'u Village Council to refine content and establish priorities and select programs and projects to undertake



<b>• Development project</b>	<b>Equipment</b>	<b>Facility</b>	<b>Service</b>	<b>Infra structure</b>	<b>Agency</b>	<b>Status</b>
• Elementary School Van.	X					
• Passenger Vessel.	X					
• Health Clinic.		X	X			
• Cement Road Around the Whole Island.						
• Power House.						
• Sea Wall.				X		
• New Wharf.				X		
• Helicopter (emergency Landing pad)	X			X		
• Rescue Boat						
• Police and Fire Station			X			
• Library		X				
• Tele Comm. Antenna Repair		X	X			
• Public Bathroom at Aunu'u Wharf (for Visitors)				X		
• Gym and Play Ground.		X				
		X	X			

### **Comments: Value Added Crops**

Value Added Crops are those that are free from pesticide and GMO. What is the position of American Samoa on Genetically Modified Crops (GMO) and seeds? On one side GMO are a new kind of crop that attracts agricultural businesses in the Pacific Islands, on the other side they may endanger the perception of the pristine islands environment as producing no-pesticide, no-GMO edible value added products that command higher prices.

For example, Hawaii Island County and Kauai County in the State of Hawai'i signed respectively different bills designed to limit the future planting of genetically modified crops. The Hawaii County bill restricts the planting of genetically modified crops to enclosed structures like greenhouses. Farmers who already grow GMO crops would be exempted from the new ban. They rely on modified varieties that are resistant to the ringspot virus. In 2008, the Hawaii County adopted a more limited genetically modified organism bill that banned genetically modified coffee and taro. The Kauai County Council voted Nov. 16 to override a veto of a bill requiring large farms to disclose use of genetically modified crops.

Reference: Honolulu Star Advertiser December 5, 2013

### **Comments: Education Work Initiative**

The NGA Education Works initiative provides DOC economic team with the alignment pursued by the NGA which is very much supported by most of all the states. The alignment is between the DOE (Headstart-ECE to K-12), community colleges, 4-year colleges, trade and technical schools, Office of the Governor, Higher Education boards, and employers (industries) to ensure the graduates meet the "New Millennium" concept. The New Millennium concept is that high school diplomas will not suffice any longer to access the middle class. Therefore, the alignment through this NGA: Education Works is to ensure that all students are career and college prepared for the industries and prospective future industries of the jurisdiction. Currently DOC is underway to assist in this effort through a Workforce State Plan led by the Director. Because DOC has adopted the Anu'u Elementary School, some creative synergism, may evolve also for Anu'u.

**NATURAL & PHYSICAL**  
**Aunu'u Island Benthic Habitat**

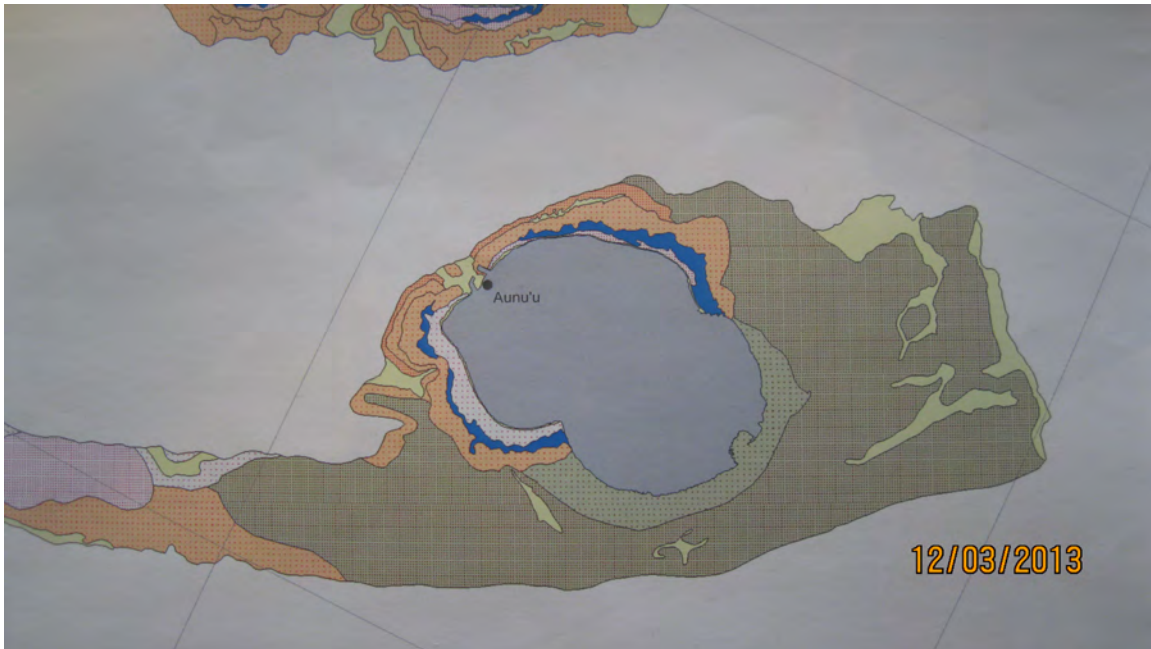


Fig. 12 Benthic Habitat Biological Cover

Aunu'u Island is characterized with the following Benthic Habitat from the island shoreline itself outward:

East Side: Turf 10%<50% a distinct band all around of 0.125 Km. Outward Seagrass 50%<90%, a large band all around 0.5 Km. Further outwards a smaller Uncolonized band.

North Side: Unknown narrow band all around the shoreline with outer band of Coral 10%<50% less than 0.125Km and a small layer of Coral 50%<90%.

East Side: The small port area is Uncolonized but just North and South of the small boat harbor the Coral band is 10%<50%. The South portion has a band of Coralline Algae all around the shoreline 10%<50% less than 0.125 Km. surrounded by an Unknown narrow band and with one pocket Uncolonized.

South Side: The South West side is similar to the South-South East side with Coralline Algae 10%<50% and Coral 10%<50% and the South East side is similar to the East side, with Turf 10%<50% and Outward Seagrass 50%<90%.

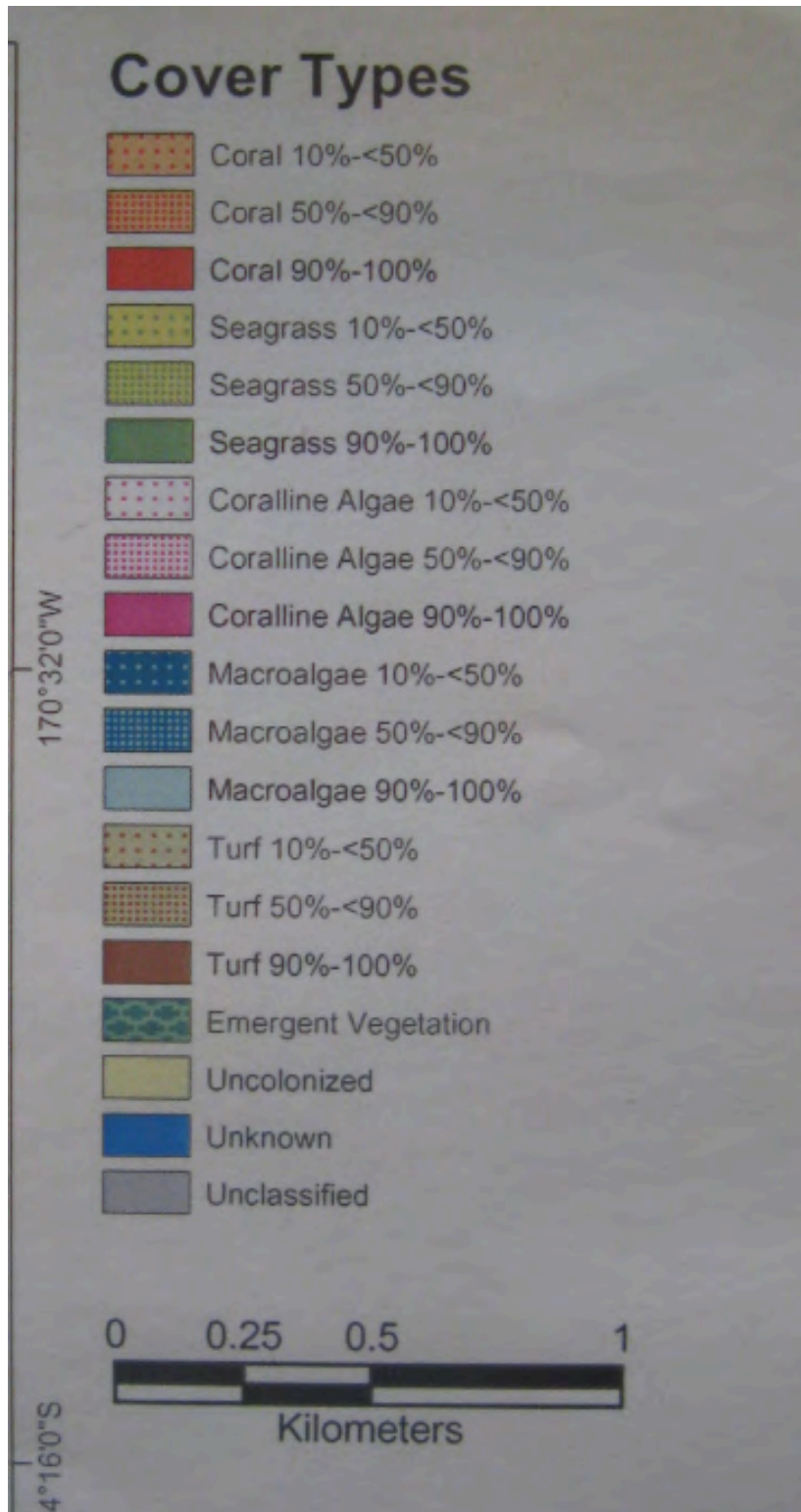


Fig. 13 Cover Types Benthic Habitat (Legend)

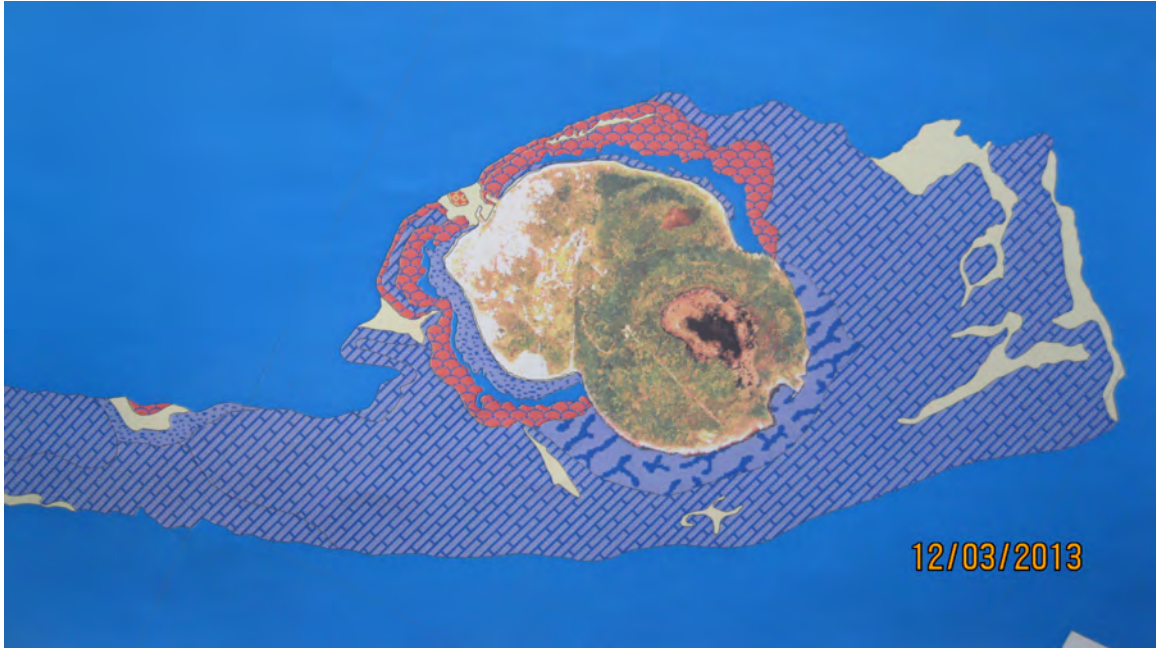


Fig 14 Structure Types

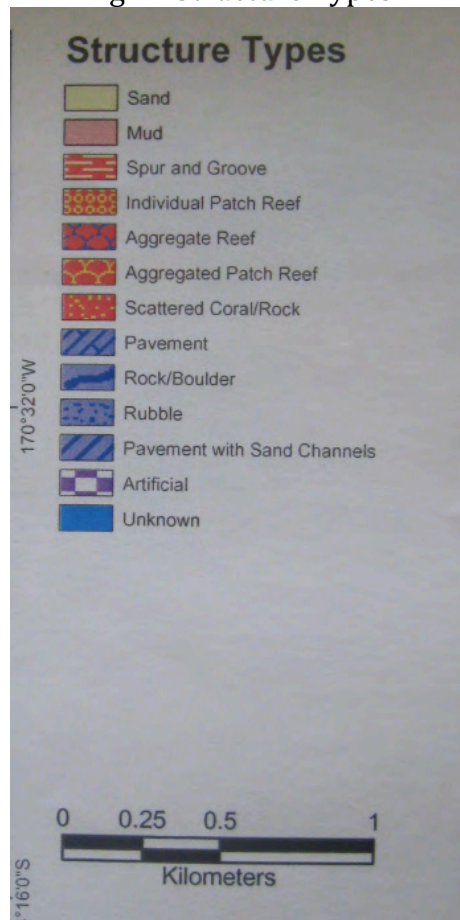


Fig. 15 Structure Type (Legend)

Aunu'u Island is characterized with the following Geomorphological Structure from the island shoreline itself outward:

East Side: All around a band of Rock/Boulder less than 0.25 Km. and outward a large band more than ½Km of Pavement.

North Side: after a narrow band all around of Unknown there is all around an Aggregate Patch Reef band of 0.25 Km.

West Side: there are two sites with sand, one is at the small boat harbor, otherwise all around there is a band of Rubble less than 0.125 Km., a narrow band of Unknown and then a band of Aggregate Reef.

South Side: The South West side is similar to the South-South East side with a band of Rubble, A band of Unknown and a band of Aggregate Reef and the South East side is similar to the East side, with a band of Rock Boulder and a large one of Pavement.

Pavement is flat, low relief, solid carbonate rock, Rock Boulder is solid carbonate block and /or boulders or volcanic rock; Aggregate Reef is high relief lacking sand channels of spur and groove; Patch Reef (Individual or Aggregate) is coral formations isolated from other coral reef formation by sand seagrass or other habitats and do not have organized structural axis relative to the contour of the shore or shelf edge. Reef Rubble is dead, unstable coral often colonized with coralline algae or other filamentous or other microalgae.

The above information and maps are useful to establish the spatial extent of each habitat and the pertinent major classes, and their proximity. They are used for monitoring tropical shallow water marine ecosystems and their biological communities and establish their importance. Scientists can use habitat maps as proxies in defining the distribution of species or groups that have specific habitat requirements. If time-series data are available the maps help in change detection. Planner can also use them to study potential impacts of projects as well as restoration activities on marine resources and for marine zoning and ecosystem protection. Recreational fisher and commercial interests for aquaculture can also use these maps.

References: US Department of Commerce. NOAA. National Ocean Service. National Center for Coastal Monitoring Assessment and Assessment. Biogeography Team. February 2005. Atlas of the Shallow-Water Benthic Habitats of American Samoa, Guam, and the Commonwealth of Northern Marianas Islands. Technical Memorandum NOS NCCOS 8.

## Aunu'u Island Coral Reef

A South Pacific Commission (SPC) survey conducted a stratified random REA sites at depths of 0-30m around Tutuila in 2010, four metrics were calculated: (A) Coral Reef (%) and (B) reef builder ratio; (reef accretors to non accretors), from benthic-image analyses and (C) total fish biomass and (D) fish generic richness from observation depicted by the size of the circle with the references given in the legends.

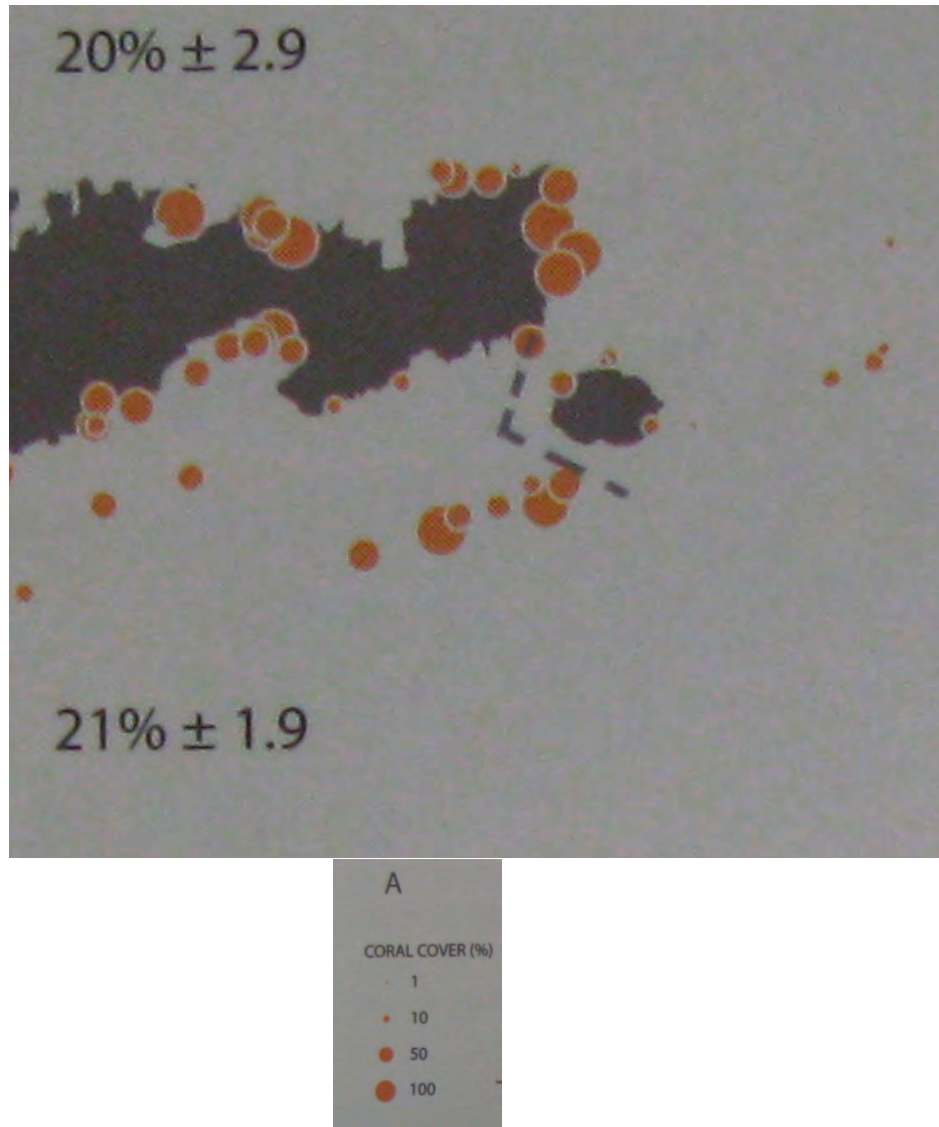


Fig. 16 Coral cover of Aunu'u Island is 50% on the North West Coast and in the West Coast side, and 10% in the North Coast but the island is located between two 100% coral cover on the North and south of it.

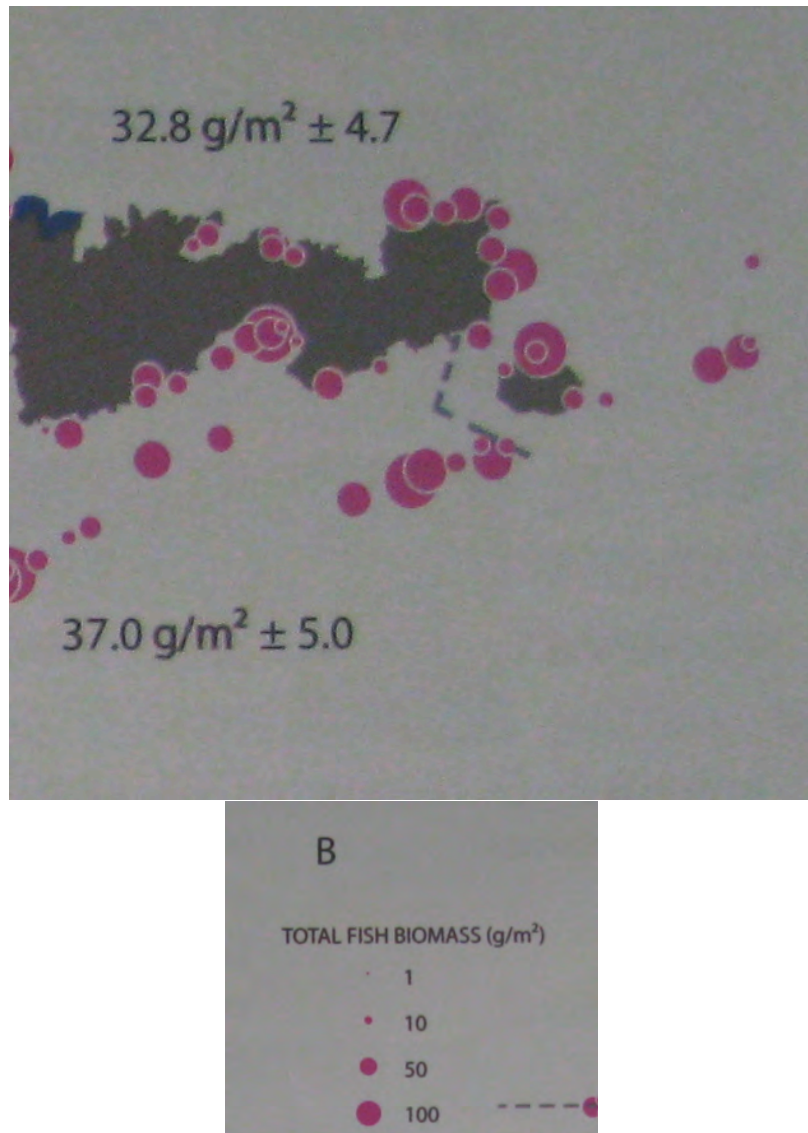


Fig. 17 Total Fish biomass in g/m<sup>2</sup> is 100% on the North Coast of Aunu'u Island and 50% on the West Coast but the island is located between 100% sites north and South West of it.



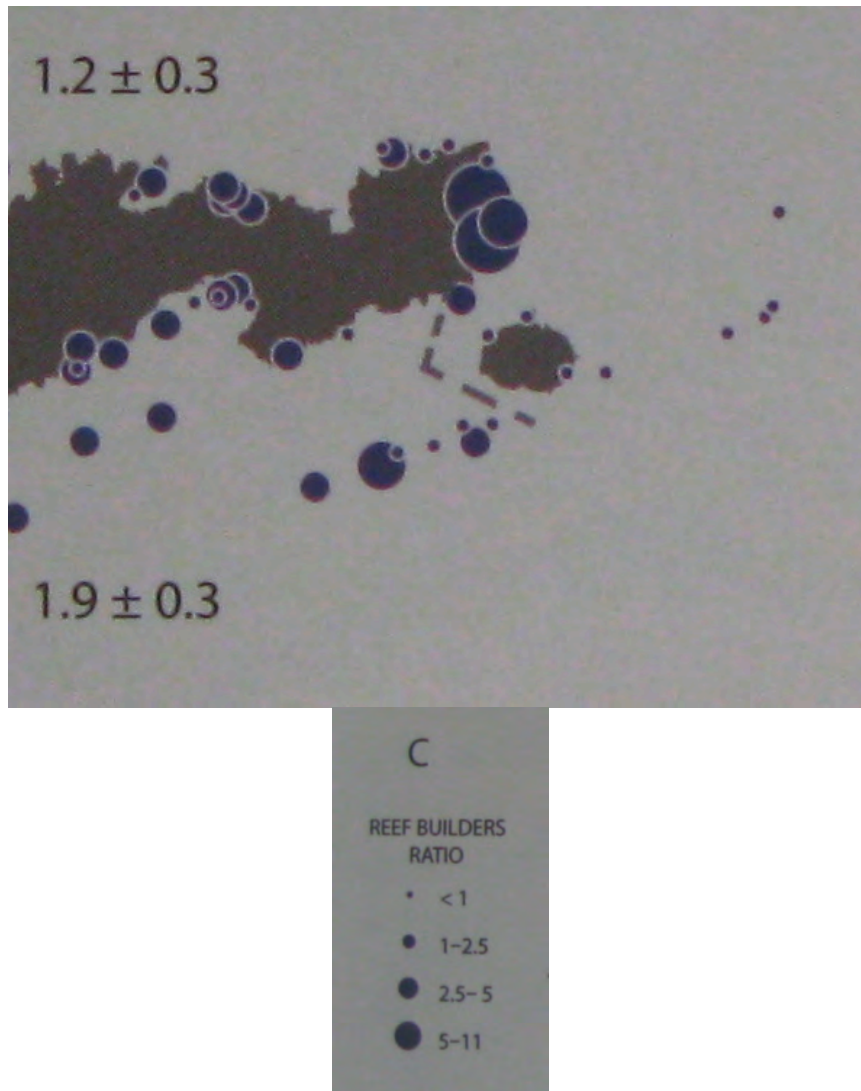


Fig. 18 Reef builder's ratio is 1-2.5 on three coastal sites West, North and East of Aunu'u Island.

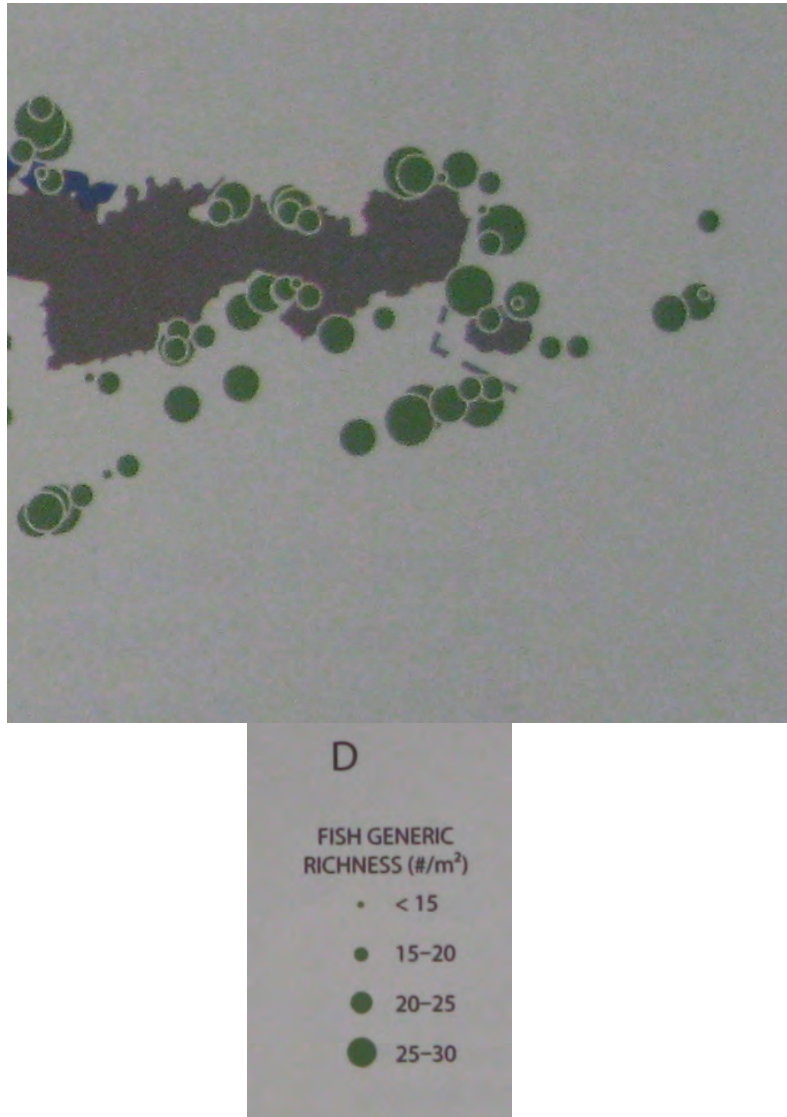


Fig. 19 Fish generic richness is in #/m<sup>2</sup> 25-30 in the North West Coast, the North Coast and 20-25 off of the East Coast of Aunu'u Island which is located to 25-30 ocean sites South West and North.

The information provided above shows that Aunu'u island is well endowment of the four metric resources and it is located within a coastal and underwater ocean regional system North and South West of the island where they are very abundant.

Reference: Pacific Islands Fisheries Science Center (2011) Coral Reef Ecosystem of American Samoa a 2002 2010 Overview. NOAA Fisheries. Special Publication, SP-11-12, 48-.

## Aunu'u Geographical Map Analysis

The topographic maps of the USGS shows the port of Aunu'u Island and the one of Au'asi where a 15 minutes boat ride serves people commuting back and forth.

It shows a reef off the North West and South West side of the island and none on the East side. It depicts the lakes and wetlands and show the individual housing unit of the village located on the East side of the island.



Fig. 20 Aunu'u USGS Topographic Map

The bathymetry map shows the 10 meters and 20 meters depth around the island and the underwater cable area reaching the island from the North West side. It shows the elevation in meters of the flat areas on the west side of the island where the village and plantation are located to vary from 1.1 meters to 4 meters. The highest point of the crater range from 46 to 95 meters on the South side of the rim.

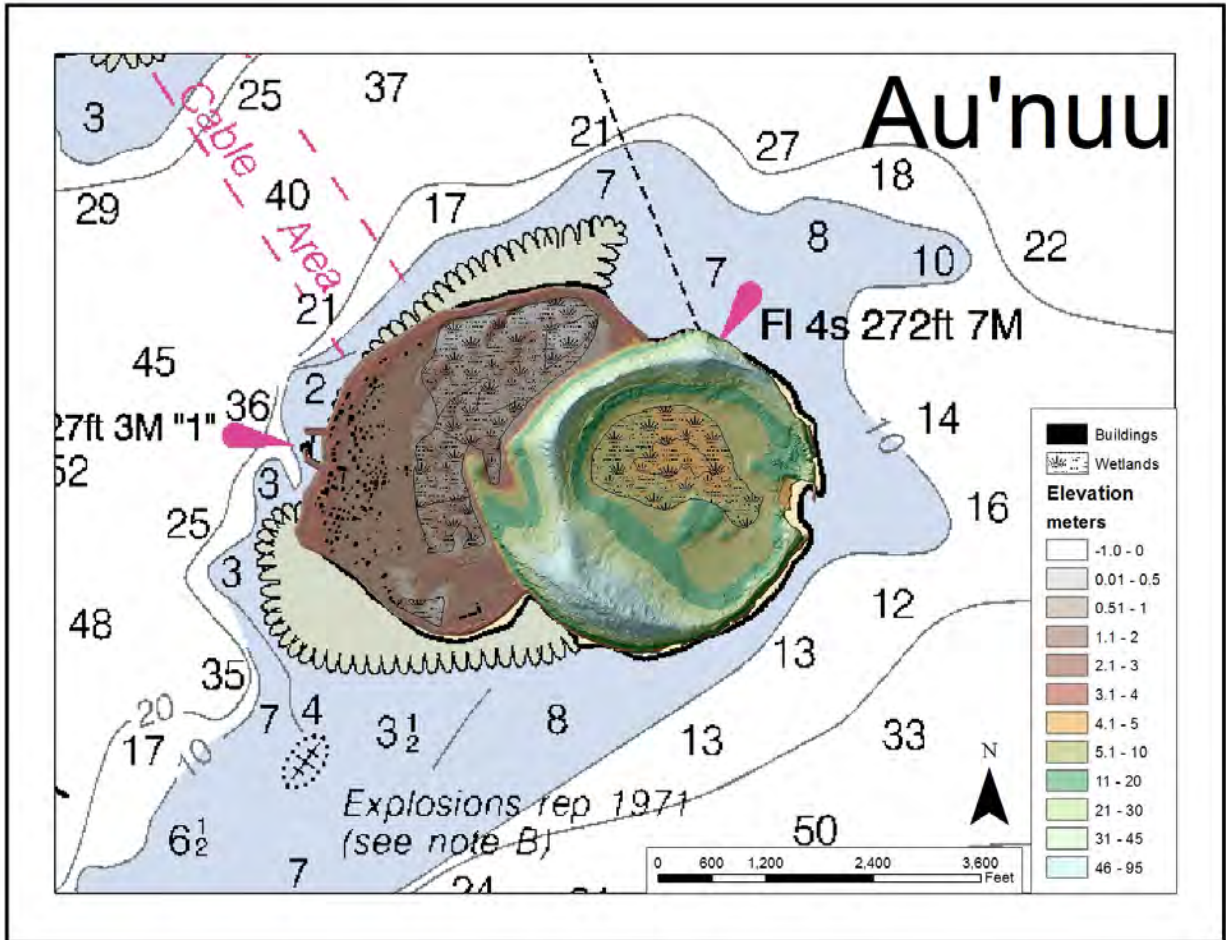


Fig. 21 Bathymetric Map



Fig. 22 Aunu'u GIS Map satellite view and 3 layers

GIS Map of Aunu'u Island depicting the village layers the cultivated wetland, the mangrove and lake areas and the crater of the volcano, as they are visible from satellite view. Additional layers depicts the building structures of the village, the roads circling the island and serving the village and the plantation, as well as the road over and around the crater rim and the Red Lake in the crater. The contour lines layers are 10 meters apart, indicating that the East side of the island where the village and the plantation are is flat.

Clearly this view of the island reveals a habitation zone where the village is located, the cultivated zone of the Taufu Fitele Marsh and a conservation zone with the Pala Lake and the slope and inside of the crater. These conservation three zones can be identified, delineated, protected and confined within their own footprint with zoning designation so as not to encroach on each others.

The map also clearly shows different stages of taro cultivation revealed by the change from green to brown color of the marsh. The North Side of the crater rim is called Pofala Hill and the South one Fogatia Hill. On the East coast of the crater there is the Ma'ama'a Cove.

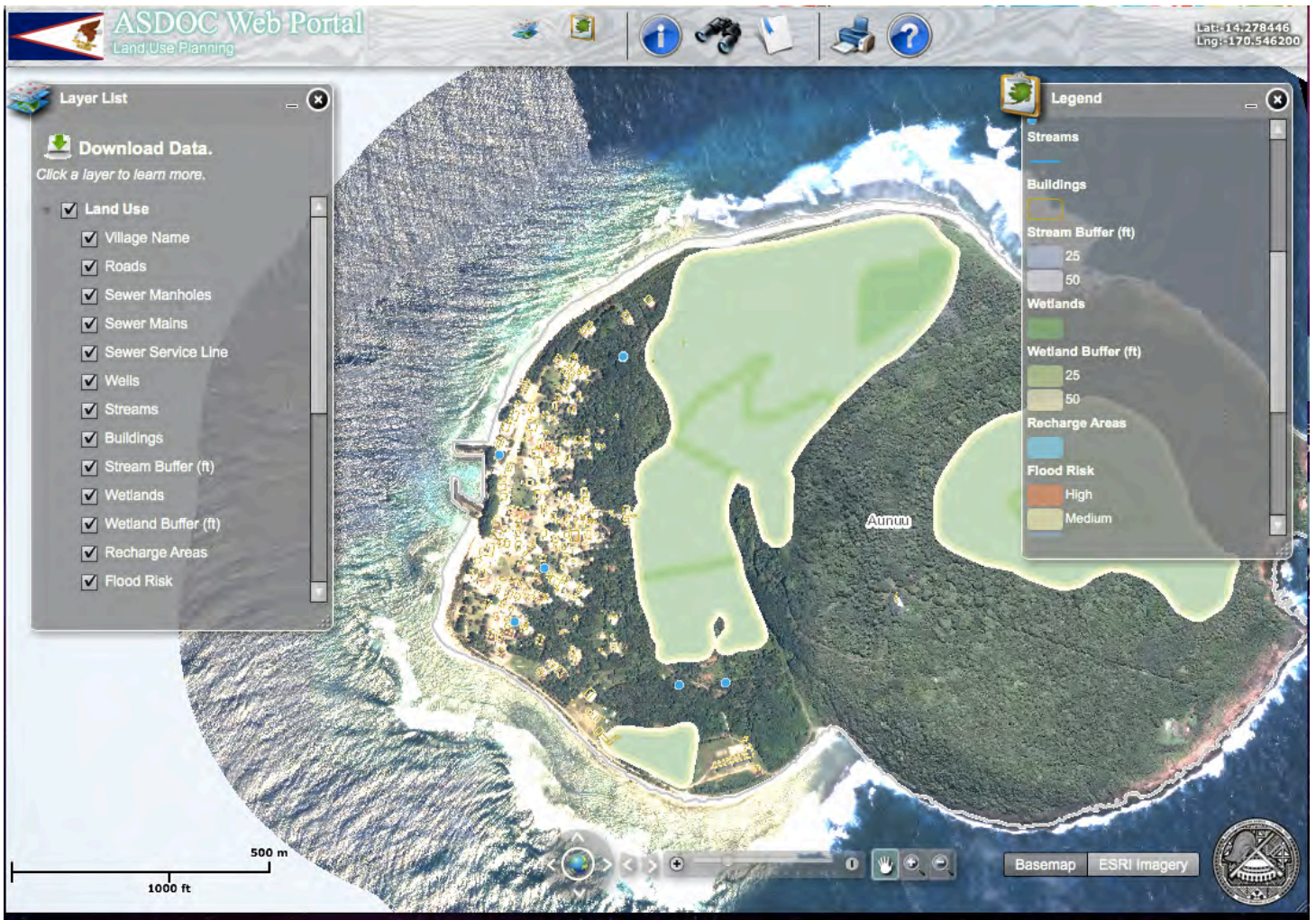


Fig. 23 Aunu'u GIS Map Multiple layers

Fig 23 depicts Aunu'u Island with the several layers that are essential to study the built environment (roads, sewer manholes, sewer service line, wells, buildings, and the natural environment (wetlands, stream-buffers, wetland-buffers, recharge areas and flood risk). However, it is better to analyze these different variables using their own individual single layer for better reading of the situation on the ground.

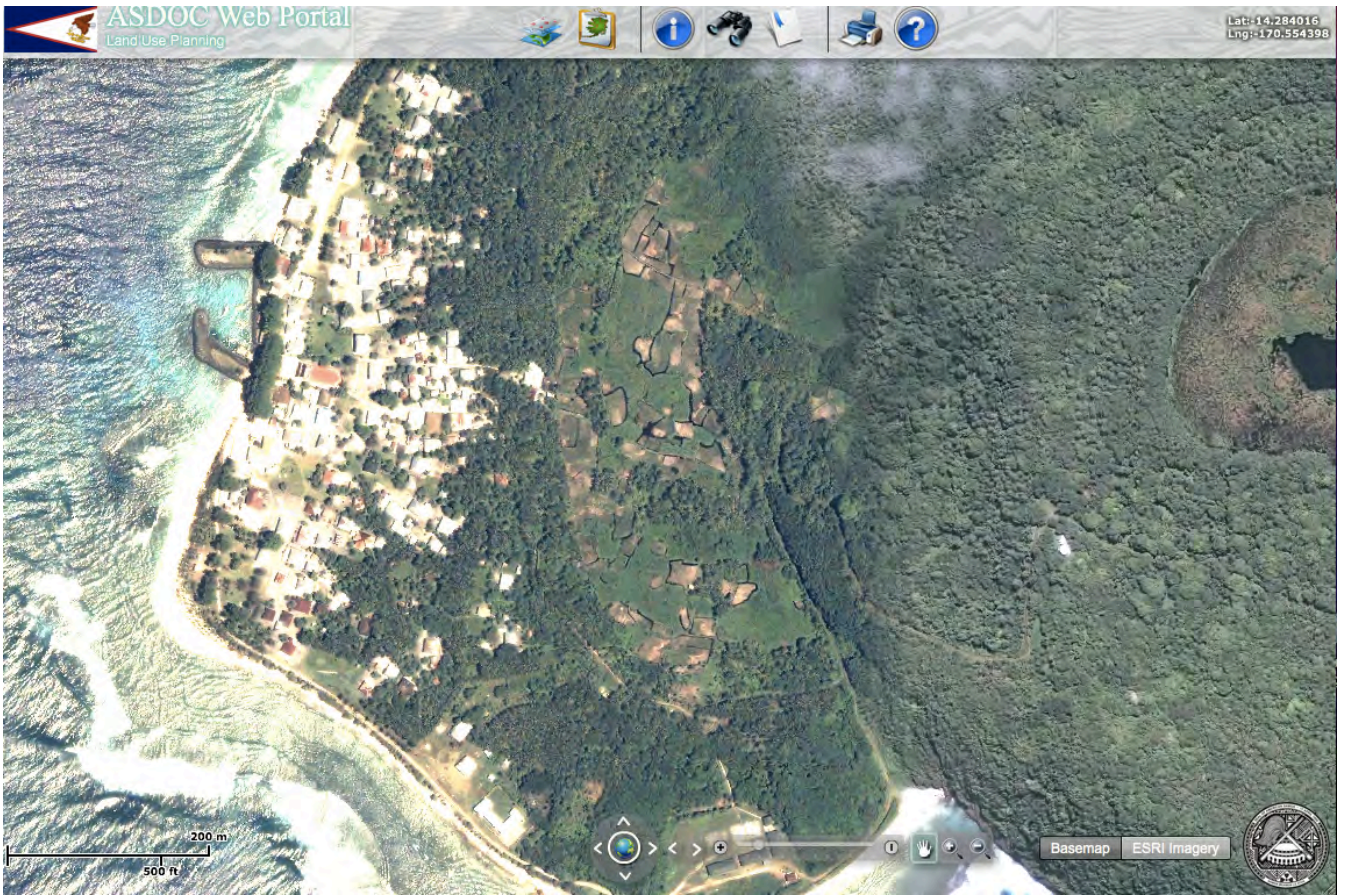


Fig. 24 Aunu'u GIS Village and cultivated are section.

Fig 24 is similar to Fig 22 but it is more detailed depicting the village of Aunu'u and the cultivated area in the marsh back of it. This map helps in analyzing the overall spatial pattern of the village and its structure and green and forested areas as well as the size, shape, and stage of cultivation of the agricultural patches. Two types of buffers can be considered between the settlement and the cultivation and between the cultivation and the conservation area for mutual protection.

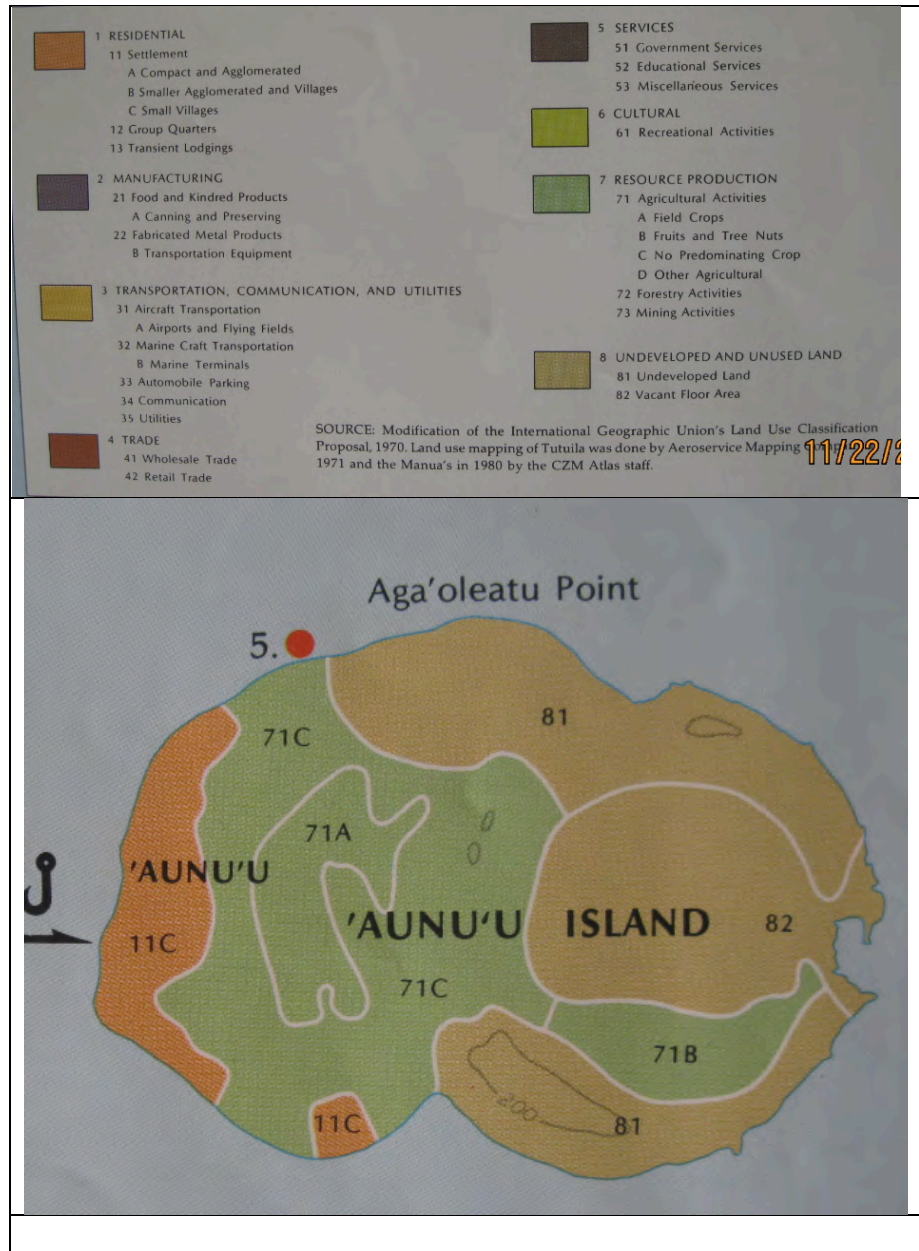


Fig. 25. Aunu'u Land Use Legend & Map (CZM Atlas of A. Samoa 1981)

Reference: Everett Wingert and Tini Lam Yuen. 1981. Coastal Zone Management Atlas of American Samoa. Honolulu: Geography Department and American Samoa Government Development Planning Office.



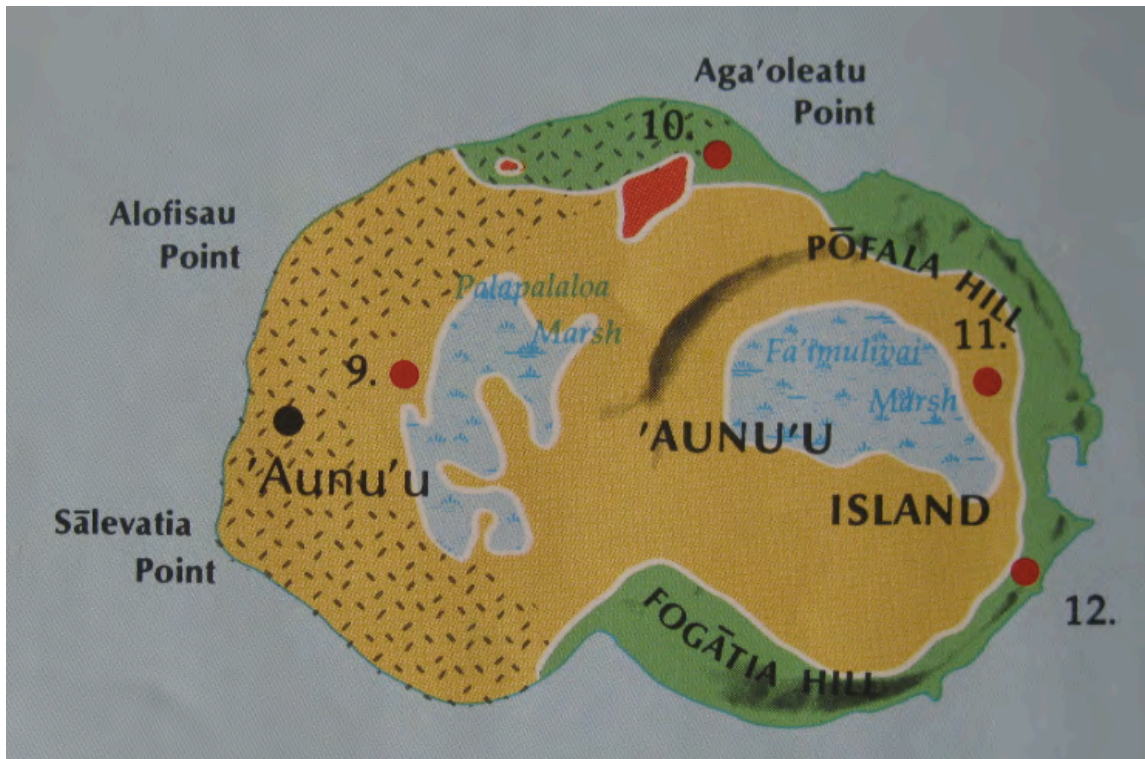
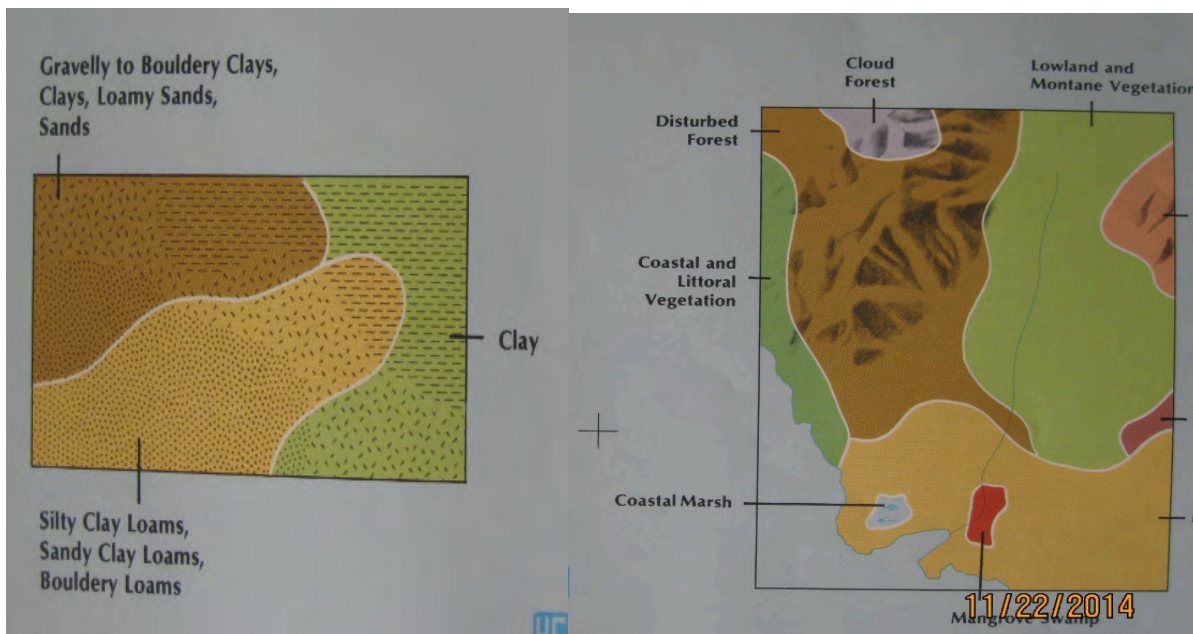
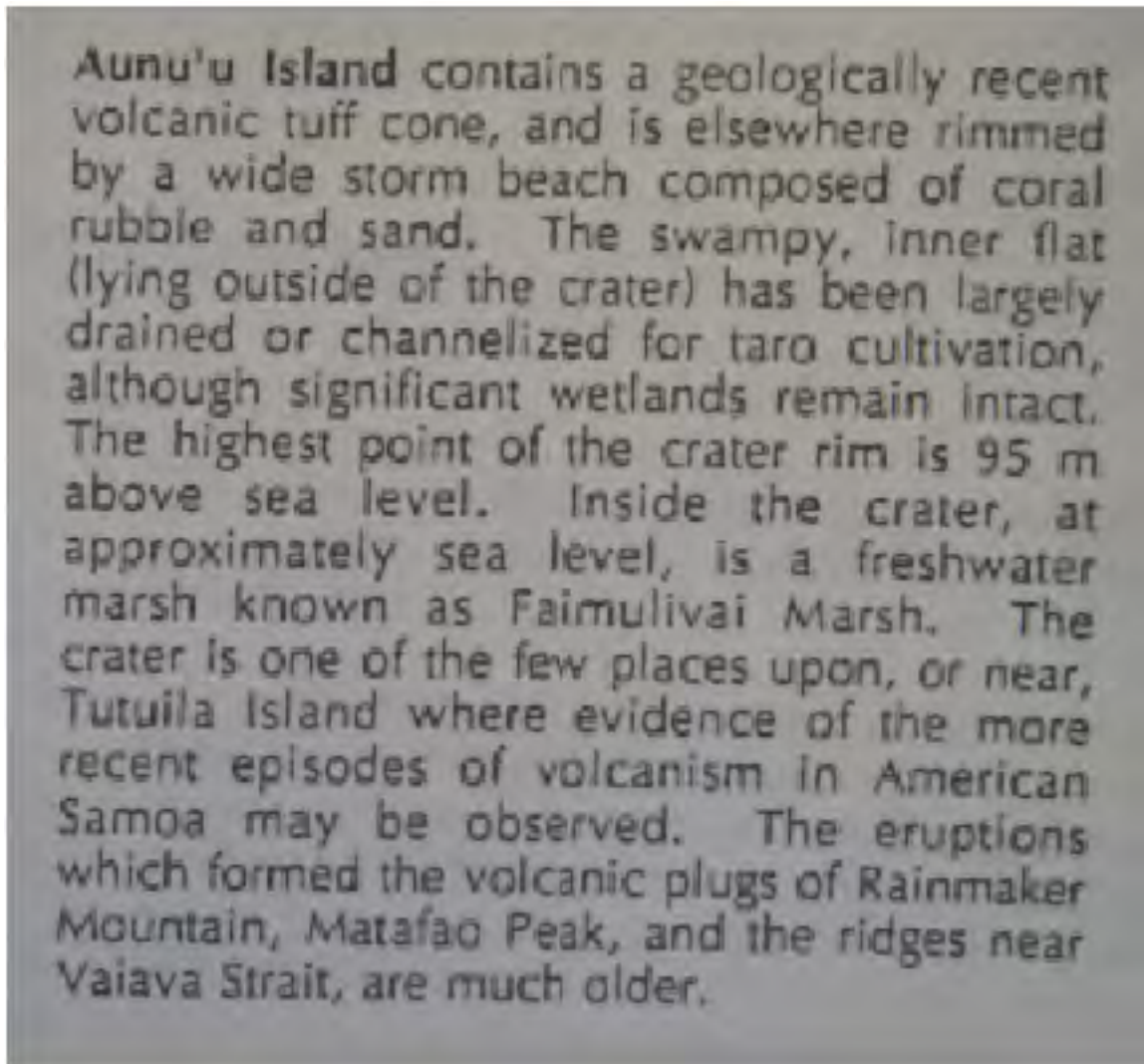


Fig. 26 Aunu'u Solid and Vegetation Map and Legend (CZM Atlas of A. Samoa, 1981)



## **'Aunu'u Natural and Cultural Resources Conservation Areas**

A study was done by Volk and Others (1992) identifying the natural and cultural resources of the American Samoa Territory including 'Aunu'u Island, that was described as follows



In addition to the above geological description the study provides one map (Fig. 27) depicting biological resources and one map (Fig. 28) cultural resources. These two maps were the basis to create another map (Fig. 29) depicting subareas on the island to be considered candidate for conservation. They include Coral Reef South of Harbor; potential turtle nesting beach; bat roost; mangrove swamp (2 acres) includes the rare Puzzlenut trees. In fact now 'Aunu'u Island is one of the American Samoa National Natural Landmarks. 'Aunu'u Island (Lonely Planet, 2003) is only 3 sq km (1.9 miles) in area and a road circle the West side of the island and the other path circle the crater rim reaching down to Ma'ama'a Cave in the

West.. The Pala Lake is on the North side of the island about 700 meters (2297 ft.) from the village. It is a quicksand lake. The habitat of grey ducks during the rainy season. The Red Lake in in the middle of the Fa'imulivai Marsh inside the crater and it is filled with eels and tilapia fish. Ma'ama'a Cove, the site of Sina ma Tigila'u (Sina and Tugila'u) the two lovers shipwrecked here. Pilaga Region, an Aitu, spirit place, is past the Orange Grove and the Water Tank and it summit is Fogatia Hill (99m).

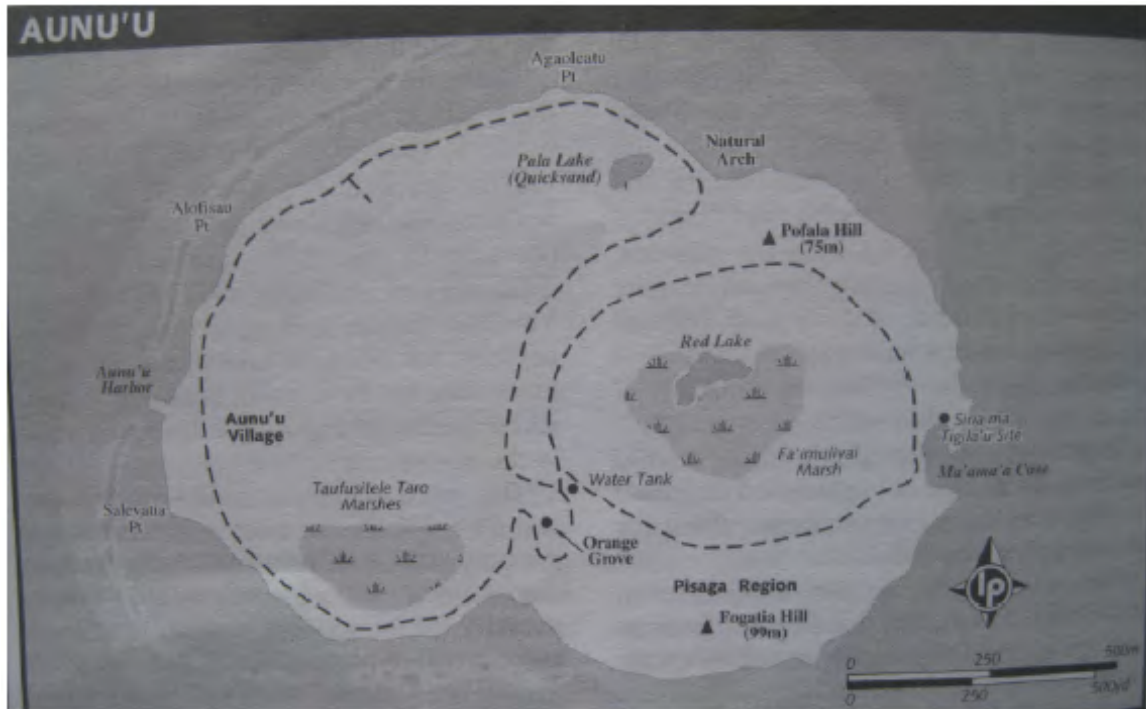
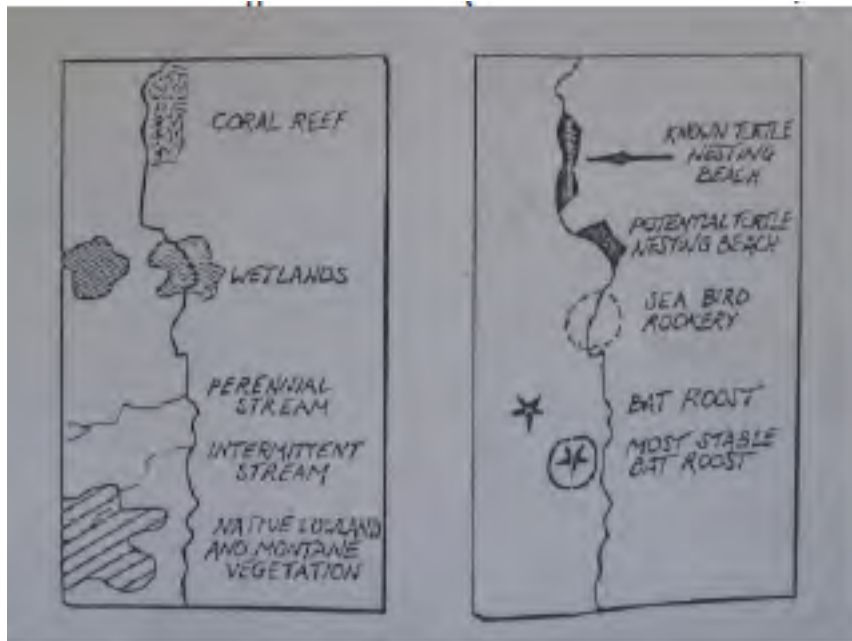


Fig. 27 'Aunu'u Island Name Place and Roads (Source Lonely Planet 2004)

The implication to utilize these studies for the planning of the Aunu'u village means that the human settlement should be contained so as not to encroach on this natural, biological asset, an additional consideration is obviously not to encroach also in the taro cultivated wetland area.



Fig. 28 'Aunu'u Island Biological Resources Map & Legend (Volk and Others, 1992)



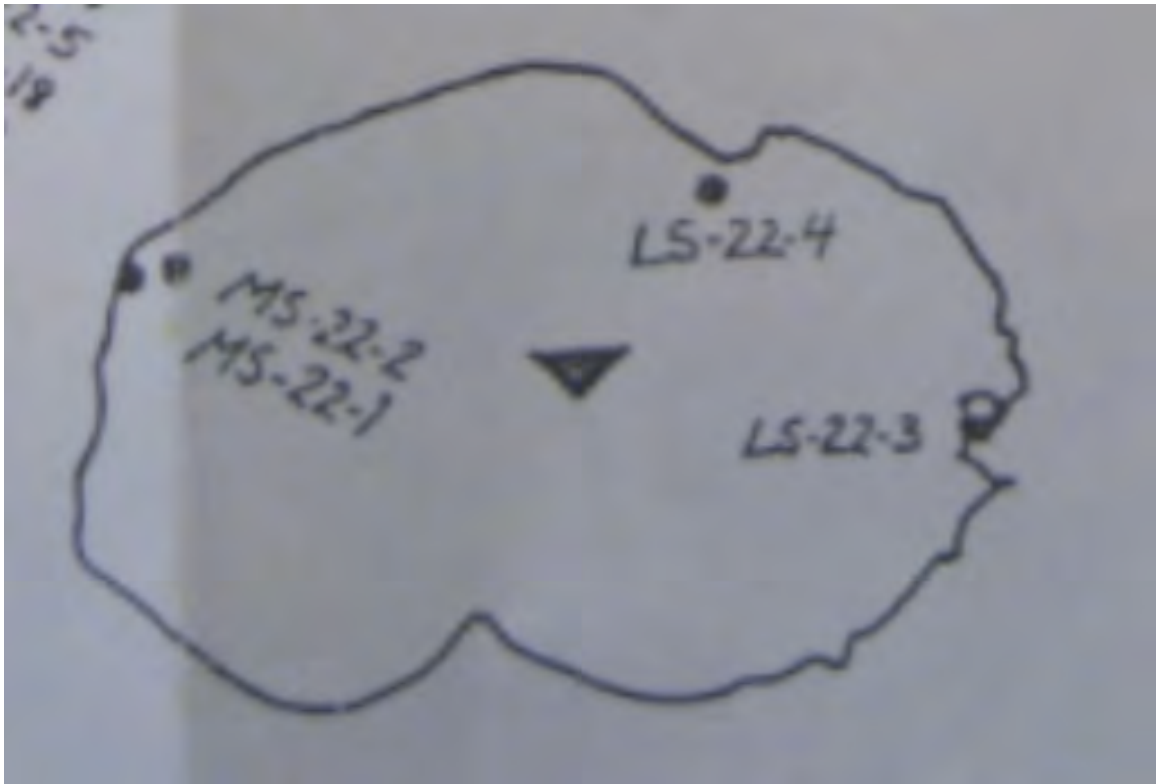


Fig. 29 'Aunu'u Cultural Resources Map & Legend (Source Volk and Others, 1992)

- LS - LEGENDARY SITE
- T - TERRACE
- P - PETROGLYPH
- PV - PREHISTORIC VILLAGE
- S - STAR MOUND
- W - WHETSTONE
- PF - PREHISTORIC FORTIFICATION
- Q - QUARRY
- M - PLATFORM MOUND
- MS - MISCELLANEOUS SITE
- USM - U.S. MILITARY SITE
- NRS - NATIONAL REGISTER SITE
- ▼ - NATIONAL NATURAL LANDMARK



Fig. 30 'Aunu'u Candidate Conservation Area (Source Volk and Others, 1992)  
'Aunu'u Village Reef, Coral Reef South of Harbor; Potential Turtle Nesting Beach; Bat  
Roost; Mangrove Swamp (2 acres) includes the rare Puzzlenut trees.

References: Volk, Richard, Knudsen Pamela, Kluge Karla, Herdrick, David. 1992.  
Toward a Territorial Conservation Strategy and the Establishment of a  
Conservation Areas System for American Samoa: A Report to the Natural  
Resource Commission, Pago Pago. Lonely Planet March 2003. Samoan  
Islands. Victoria: Lonely Planet Publ. 4<sup>th</sup> Edition

For the plants, mammals, reptiles, and amphibians, and birds indices and  
checklists are provided for Tutuila, by P. Craig 2002. Natural History to American  
Samoa. Pago Pago dept. of Marine and Wildlife Resources, as a reference because of  
the proximity of Aunu'u to Tutuila.

## Aunu'u Shoreline

USACE (September 2006) describes the shoreline of Aunu'u islands as follows: Aunu'u Island is located off the southeast coast of Tutuila Island separated by a 4000-foot wide channel. The island is a volcanic cone built on top of the submerged barrier reef that surrounds Tutuila Island. Aunu'u Island is roughly circular in shape, with an approximate diameter of one mile. The island can be divided into two distinct geological sectors: the basalt cliffs comprising the remnant of the cinder cone on the east side, and the low coastal plain on the west side. The dominant characteristics of the Aunu'u coastline are:

1. The basalt sea cliffs around the east half of the island.
2. The broad, shallow fringing reef off the west shoreline.
3. The exposure of the coast to the prevailing trade wind waves that refract around the almost circular island. Only the west shore is in the lee of these waves.
4. The long expanses of coral rubble and beach rock shoreline extending along the north and south coasts adjacent to the basalt sea cliffs. The absence of sand on these coasts is indicative of a predominant littoral drift toward the leeward side of the island, caused by the refracting trade wind waves.

The village of Aunu'u is located on the flat coastal plain on the western coast. The Aunu'u Small Boat Harbor was built in 1981 on the western shore, in front of the main village.

Reference: USACE. 09, 2006. American Samoa Shoreline Inventory Update. Honolulu: USACE



Fig. 31 Orthofoto of Aunu'u Island 09 November 2003

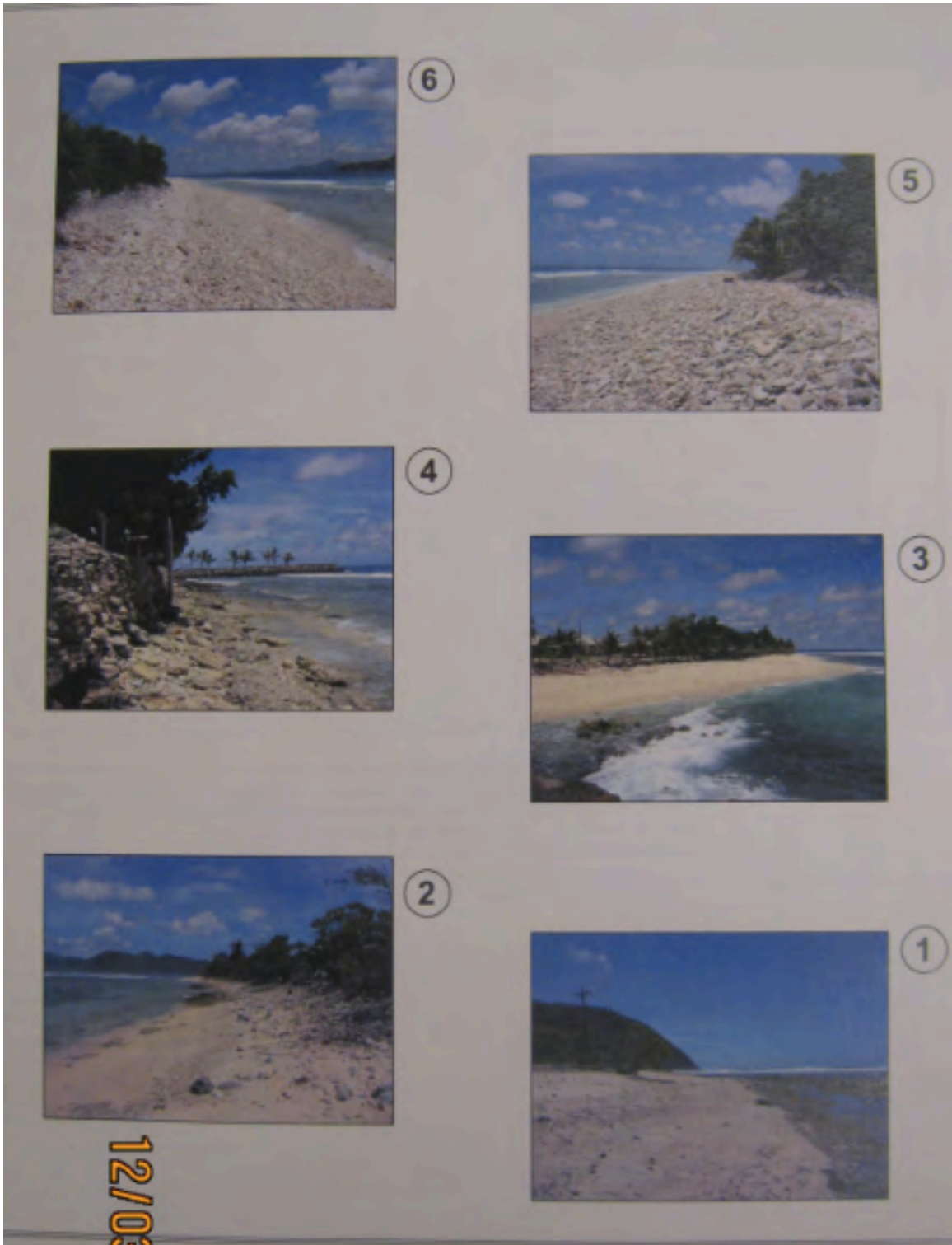


Fig. 32 Pictures of Aunu'u Coast sites described in the USACE report



## AUNU'U ISLAND (A)

### AUNU'U ISLAND (A-1)

Aunu'u Island is located off the southeast coast of Tutuila Island, separated by a 4000-foot wide channel. The island is a volcanic cone built on top of the submerged barrier reef that surrounds Tutuila Island. Aunu'u Island is roughly circular in shape, with an approximate diameter of one mile. The island can be divided into two distinct geological sectors: the basalt cliffs comprising the remnant of the cinder cone on the east side, and the low coastal plain on the west side.

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The village of Aunu'u is located on the flat coastal plain on the western coast. The Aunu'u Small Boat Harbor was built in 1981 on the western shore, in front of the main village.

Fig. 33 Description of Aunu'u Island Reach

### **REACH B: 1250 FEET, PHOTOS 3 AND 4**

- This reach consists of Aunu'u Small Boat Harbor and the adjacent shoreline. The Corps of Engineers completed the harbor in April 1981. It provides an entrance channel 175 feet long, 70 feet wide, and 14 feet deep; a turning area of 7500 square feet~ and 14 feet deep; a mooring area of 13500 square feet, 8 feet deep; a northern revetment mole 300 feet long; a wave absorber 200 feet long; a stub breakwater 90 feet long and a southern revetment mole 220 feet long.

- A vertical, grouted coral wall 3 to 5 feet high previously noted along 300 feet immediately south of the harbor was not located (Photo 3). For a 200-foot distance south of the grouted wall, concrete and coral rubble has been piled on the seaward side of the road for protection. There is no evidence of erosion, and there are some signs of accretion such as the approximately 8 ft berm elevation.

### **REACH C: 4250 FEET, PHOTOS 5 AND 6, PROFILE 2**

- A stable beach with a wide backshore consisting of a coral cobble berm and a vegetated zone of shrubs and coconut trees. As in reach A, the foreshore grades from predominantly fine to medium sand along the southern part, to steeply sloping coral pebbles and cobbles at the northeast end.

Fig. 34 & 35 Description of Aunu'u Island Reach

Fig 36 maps the important data of Shoreline Types, Shoreline Protection, and Shoreline Status for the West Coast of the island of Aunu'u:

- The North Coast (Section C) Shoreline Status is marked "Non-Critical", with Shoreline Type of "Pebble" and "Cobble and Sand".
- The West Coast (Section B), just above the small boat harbor, Shoreline Status is marked "Potentially Critical" with Shoreline Protection Type indicated with "Marginal Shore Protection". That is right on the Aunu'u village front.
- The South - West Coast (Section B), below the small boat harbor, Shoreline Status is marked "Non Critical" but with Shoreline Protection indicated with "Marginal Shore Protection". That also fronts the village.
- The South West Coast (Section A) Shoreline Status is mapped "Non-Critical" but has Shoreline Protection mapped "Marginal Shore Protection" in two sites. They front the new paved road to the school and some scattered structure across the street.
- The South Coast (Section A) Shoreline Status is marked Non-Critical.

The above information is essential for disaster prevention and mitigation analysis in case of hurricane, storm surge, tsunami, earthquakes, coastal erosion, flooding, and sea level rise and in village land use planning.

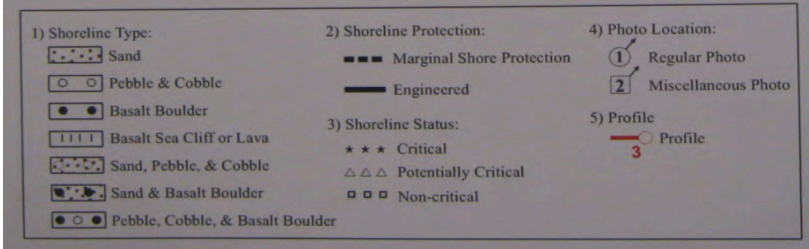
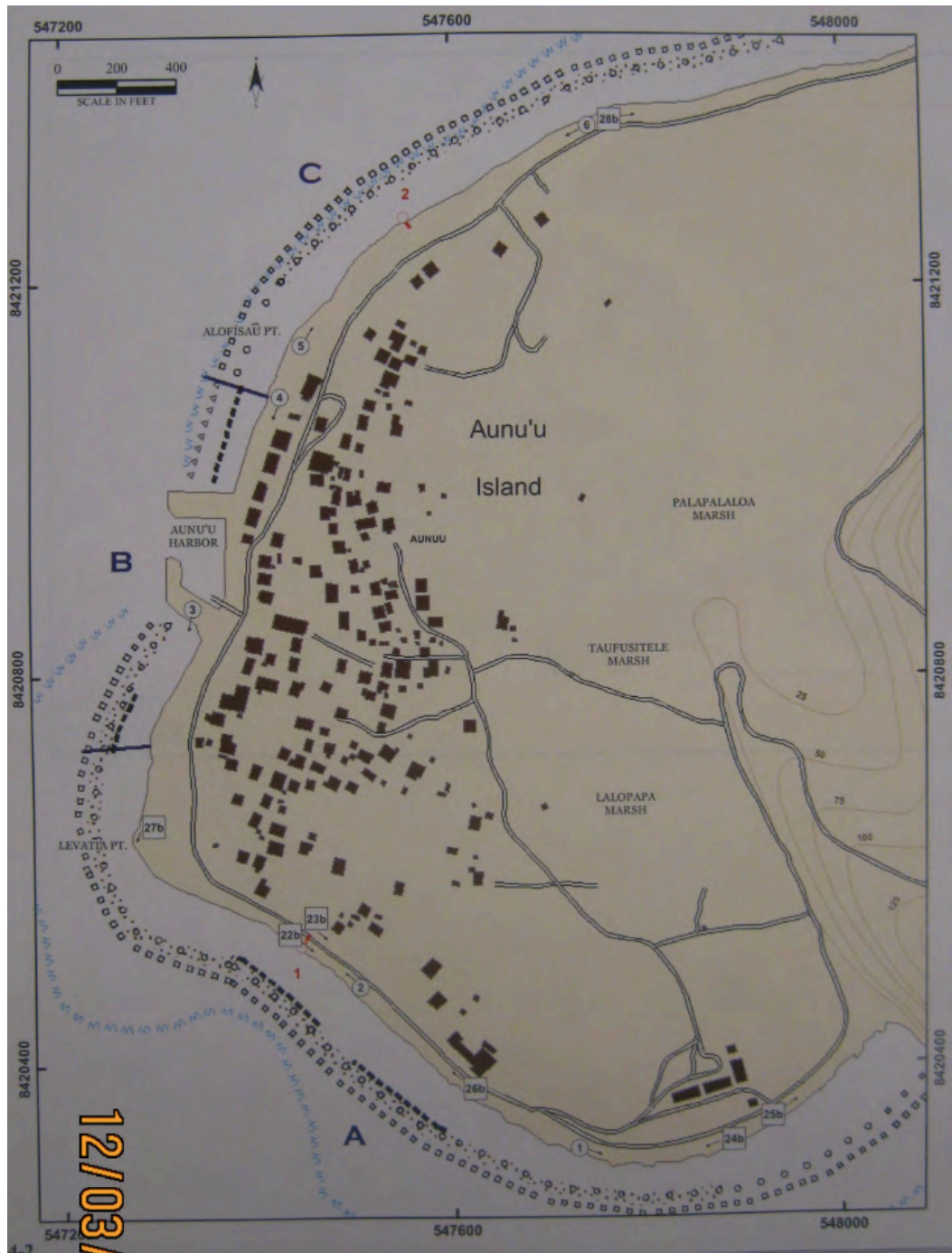
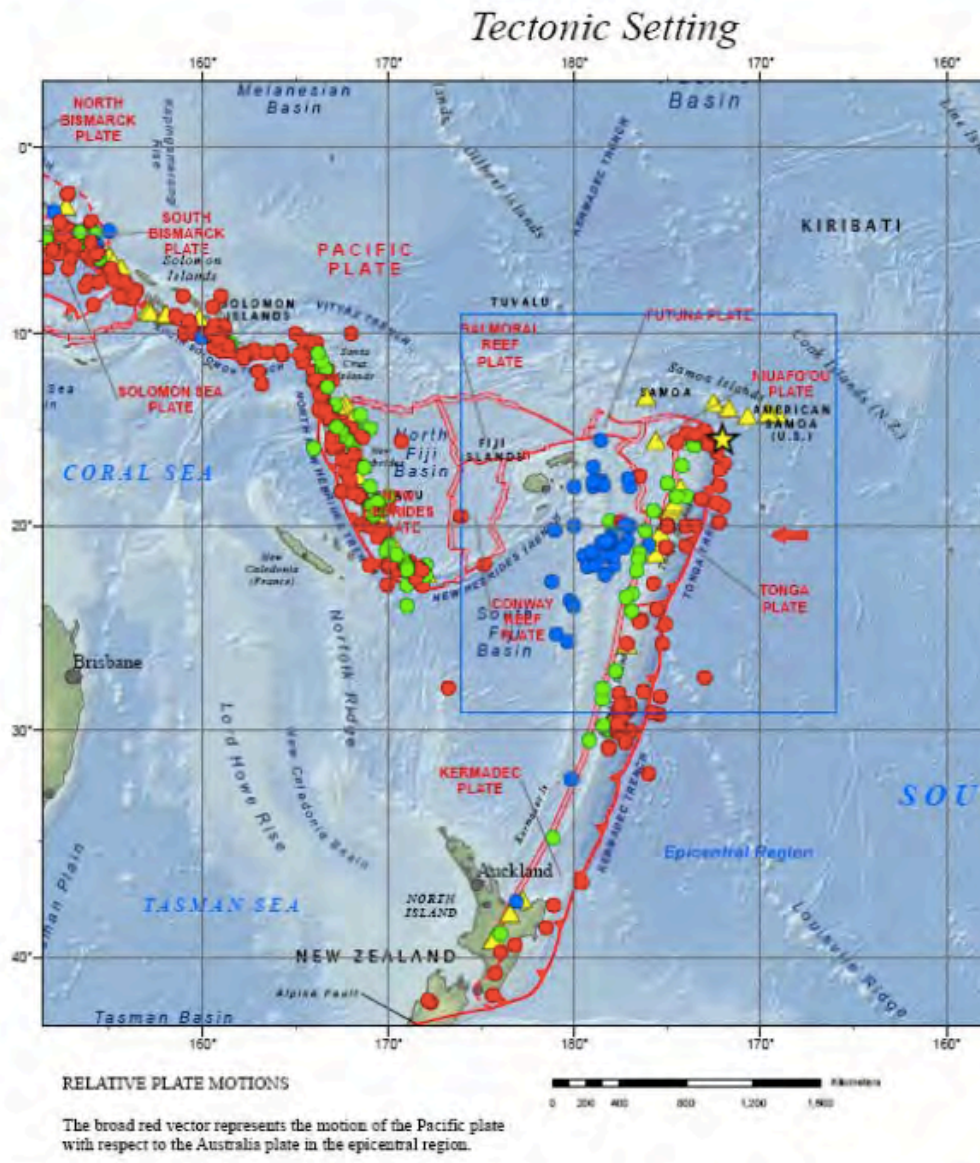
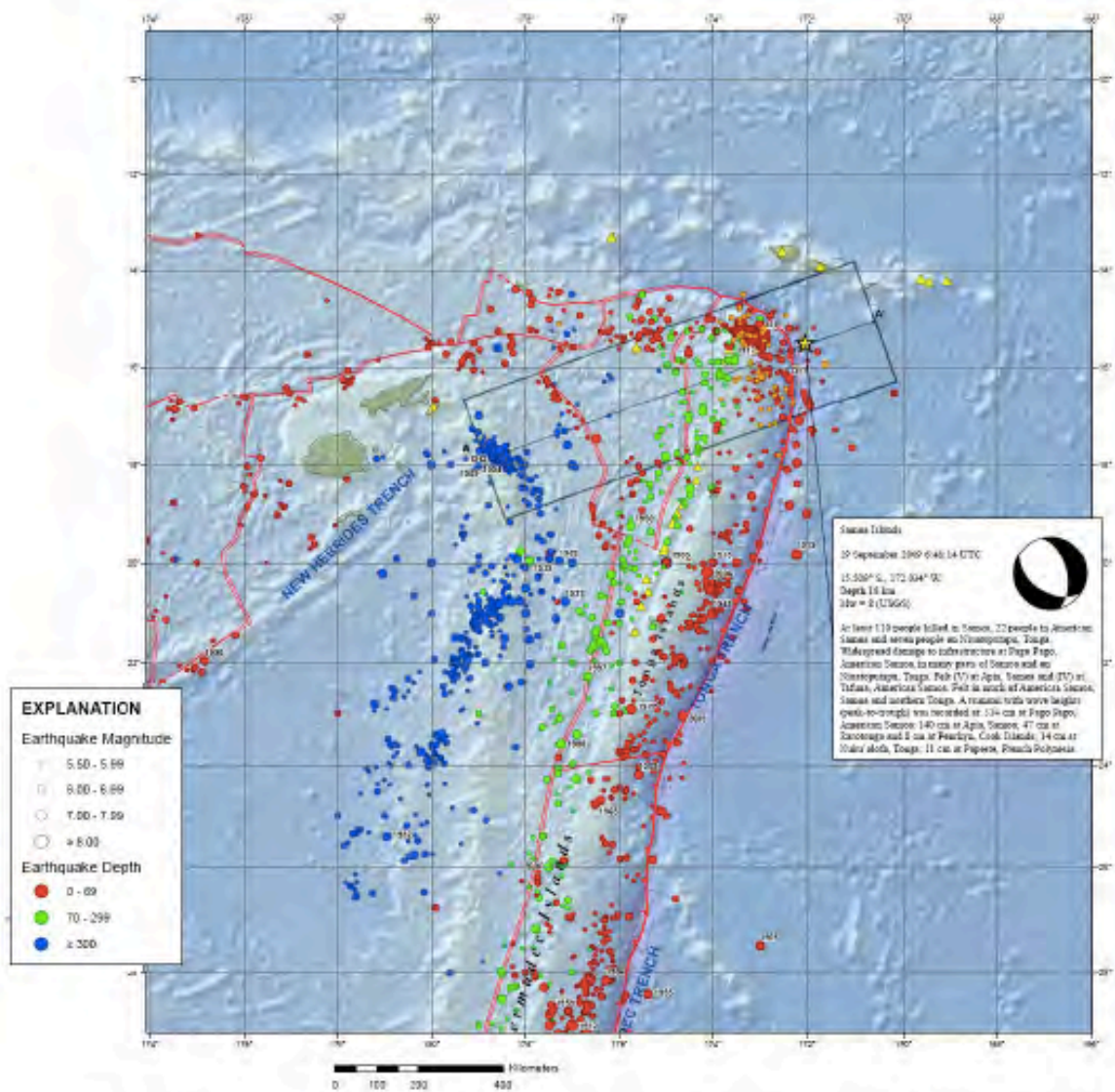


Fig. 36 Shoreline Types, Shoreline Protection and Shoreline Status Aunu'u  
 Reference: USACE. 09, 2006. American Samoa Shoreline Inventory Update.



**Figure 2. Tectonic Setting of the Samoa Islands Region (Courtesy U.S. GEO Earthquake Information Center, 2 October 2009)**

Fig. 37 Shows the Aunu'u Island is the tectonic region north East of the Tonga Plate and in volcanic region, so it is and remains under earthquake risks like all of Tutuila Island.



**Figure 3. Seismicity for 2009 for the Samoa Islands Region with Earthquake of 29 September 2009. (Courtesy U.S. GEOLOGICAL SURVEY Earthquake Information Center, 2 October 2009)**

Fig. 38 does not show seismicity directly for Aunu'u or Tutuila Islands, however tsunami waves may be generated in the seismic region to the South West that may affect in the future American Samoa.

The map below, depicting the tsunami simulation model for some reason cuts Aunu'u Island in two, however it is possible to see that the North Coast and the South Coast of the Aunu'u Island may have inundation waves of 5 to 10 meters. Perhaps DOC can obtain the map containing Aunu'u in its entirety.

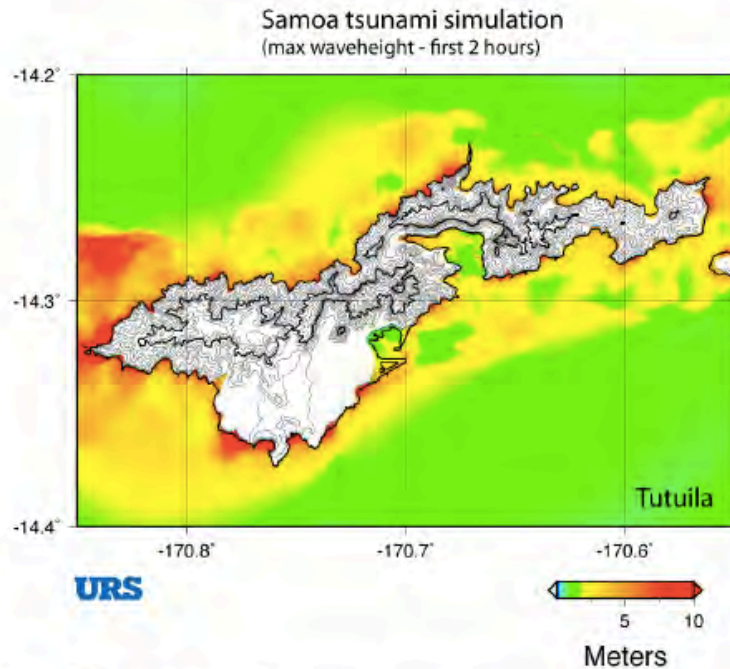


Figure 5. Detailed map of maximum wave heights in American Samoa (Tutuila)

Fig, 39 Samoa Tsunami Simulation

**References:**

Donahue, Jennifer, Project Engineer, Geosyntec Consultants Michael Olsen, Assistant Professor, Oregon State University Hong Kie Thio, URS Paul Somerville, URS. . October 2009.. [American Samoa Tsunami Reconnaissance Report September 29, 2009](#). GEER Association Report No. GEER-019

## INFRASTRUCTURES & FACILITIES

### Aunu'u Water

A provisional U.S. Geological Survey (USGS) report, published by USGS in 1991, correlated geological information, as well as rainfall and surface runoff data, to rate the capability of 110 drainage basins on the Islands of Tutuila and Aunu'u to support future water resource development. All basins were studied in terms of their recharge capacity, the potential to yield high quality water, and their accessibility for drilling. Basins that were believed to have a greater groundwater development potential were selected and a "groundwater index" was assigned to each basin. Basins with a larger index number were considered to have a greater potential for water resource development.

The overall plan of the American Samoa Power Authority, Water Division, first and foremost, is make clean, safe and potable drinking water to every resident of the territory at an affordable cost; construct new sewer lines to connect every household into the sewer system, if possible, or provide the appropriate on-site wastewater treatment system (septic system).

Additionally, improvements to the landfills are in the plans for Aunu'u.

To execute plans financial support is needed. Therefore, the ASPA shall diligently pursue and secure needed funds from federal agencies such as the U.S. Department of Interior, U.S. Environmental Protection Agency, U.S. Department of Commerce, Economic Development Administration, U.S. Department of Commerce, Housing and Urban Development, U.S. Department of Agriculture, Rural Utilities Service and other federal agencies that supports various programs in the territory. In addition, secure financing from donor agencies, banking and other financial institutions.

Lastly, the Solid Waste Division of the American Samoa Power Authority has expanded collection of trash to eastern and western parts of Tutuila. The Futiga Landfill has been expanded and reconstructed to meet local and federal requirements on solid waste disposal. Heavy equipment has been purchased to facilitate proper burial and covering of waste and to eliminate foul odor and fly infestation. New Landfills have been planned for the island of Aunu'u.

Reference: Regional Consultation Workshop on Water in Small Island Countries  
Sigatoka, Fiji, 29 July - 3 August 2002 Proceedings of the Pacific Regional  
Consultation on Water in Small Island Countries – American Samoa  
Briefing Paper – 18.

Ground-water and rainfall data for the period October 1987 through September 1997 from Tutuila and Aunu'u, American Samoa, are plotted in time-series graphs and summarized. The data include pumpage and chloride concentrations, including 3 production wells on Aunu'u. The three production wells on Aunu'u have been pumped at various rates less than 0.1 million gallons per day and had chloride concentrations usually in excess of 500 and often in excess of 1,000 milligrams per liter.

Reference: Scott Izuka. 1999. Summary of Ground-Water Data for Tutuila and Aunuu, American Samoa, for October 1987 Through September 1997. USGS Open-File Report: 99-252. U.S. Geological Survey. USGS Pacific Islands Water Science Center.



## **Aunu'u Infrastructures**

### Capital Improvement Program (CIP)/(FHA) \$ Budget Expenditures

What are the past, current and future CIP/FHA expenditures, type, amount and time frame for Aunu'u Island

Projects: FY

DPW: roads, etc.

ASPA:

### Aunu'u Infrastructures

What are the existing lines, distribution, storage and planned building hook-up for and where are located on a map in Aunu'u?

Electricity (solar, etc.)

Gas, gasoline, petrol, supply, storage capacity, disposal, recycling

Water

Telecommunication

Road & Trails

Is there plan for small-scale appropriate, alternative, off-grid technologies?

### Aunu'u Services and Facilities

Are there any projects in the works for these service area:

Boat landing & port

Water, water tank, water distribution, desalting technology

Garbage & waste collection, recycling and disposal

Telecommunication (infrastructure)

Fire and Police (infrastructure)

Health (infrastructure)

Schools (infrastructure)

### Best Management Practices, Low Impact Design, and Impervious Surface Reduction

Are there BMP for construction and operation that DOC planners should know that ASPA and PWD use?

Are there regulations for Low Impact Design (LID) and for Impervious Surfaces (IS) limitation that ASPA and PWD use?

### Notes

For Aunu'u Island the American Samoa Power Authority (ASPA) has maps, single line diagrams, location of wells, power lines, tank, wells, landfill, etc. ASPA is stepping up the maintenance of Aunu'u facilities.

There is no water pumped from Tutuila to Aunu'u, which has its own two shallow wells and a storage tank. The water is too brackish to drink so we provide drinking water through a Reverse Osmosis desalination system.

Power is generated on Aunu'u using two generating sets. Power used to be provided by underwater cable but it was damaged about ten years ago.

## **Meeting with American Samoa Power Authority (ASPA)**

Tuesday December 3, 2013

- \* ASPA is responsible for solid waste, water and power. These functions used to be with DPW.

### Water Tank in Aunu'u

- \* The new Water Tank in Aunu'u was put in 2010 cost about \$200,000, (capacity 70,000 gallons). Its hydraulic system control the pressure in the system and ASPA has put in also the pipelines to the village.

### Wells in Aunu'u

- \* There are 3 wells in Aunu'u one not operational, one stand buy, and one operational.
- \* The water in the well is not drinkable without treatment because of salinity.
- \* The EPA Safe Drinking water Act support drinkable water and guides standards and operations followed by ASPA.
- \* In addition to the Water wells managed by ASPA there are individual family water wells in Aunu'u.

### Wastewater in Aunu'u

- \* Wastewater requires a sewage system that it is in place, however the sewage system discharge directly into the ocean at two outfalls, there would be the need to treat the water (secondary treatment) before discharging. The outfall is in front of the Village of Aunu'u on next to the port and one in the south portion of the village just north of the Mormon Church.
- \* Plans must be submitted to EPA
- \* Drinking water Act is the guide
- \* There are problems with the sewage treatment, as there is no sewage system plant so on the priority list is to treat the sewage outflows before they are discharged into the ocean.
- \* There are two sewage outflows one is near the wharf.
- \* There do exist sewer lines

### Drinking Water

- \* There is water loss in the system in American Samoa a water recovery study has a consultant working for this Water Recovery Task Force.
- \* ASPA treats the drinking water monthly (since the last two years) and EPA checks and tests the quality of the water that has no contamination.
- \* The drinking water is bottled for free two 5 gallons containers per customer, Monday-Wednesday-Friday.

### Possible Water and Health Research

- \* EPA Director suggests that DOH is contacted and a study is done to check disease of patients with ASPA & EPA information so as to correlate to the quality and condition of water: sound a good fundable research project. This would also apply to the unexplained finding of Radon in the wells.

- \* EPA priority human health and water quality is a key factor in health.

#### Possible Cable Under the Ocean for Transmission of Water and Power

- The 1 mile submarine cable between Aunu'u and Au'asi is not anchored properly and it is not currently working; if repaired drinking water and electric power can be transmitted underwater cable to Aunu'u: this could be a project.

#### Power Generators

- \* There are 3 generators located before the school, there are going to be relocated. EPA approves one power plant.

#### Utility Maintenance

- \* ASPA maintain the water system and also the utility poles.
- \* Need a van for Aunu'u.

#### Alternative Energy

- \* Small grid and grid integration are issue.
- \* Solar generator does not adjust to differences in energy availability.
- \* 25Kilowatt for Aunu'u would be possible but there are issues on grid integration, cost of service, problem of load and capacity, and would be cheaper from Tutuila.
- \* There is wind-monitoring equipment on the phone tower.
- \* Wind study with monitoring equipment can check the feasibility of wind energy in Aunu'u.
- \* A contractor is exploring what sort of renewable energy combination is feasible for Aunu'u.
- \* Energy Action Plan adds clarify to next steps in energy planning.

#### Solid Waste Disposal System

- \* Waste disposal is an issue as there is an open dump with no liners no equipment to manage as a sanitary landfill in Aunu'u.
- \* Recycling of scrap metal requires shipping to NZ.
- \* A container for shipping recyclables is expensive, aluminum can is \$3-\$4/per container, rates per scrap metal is cheaper.

#### Utility Poles

- \* ASPA is replacing old utility poles.

#### Gasoline

- \* Retrofit existing units, ratio, diesel, storage, and shipping.

## **Meeting with Department of Public Work (DPW)**

Tuesday December 3, 2013

DPW main role is to maintain the roads with limited funds.

### Roads

- \* The route of Aunu'u is part of the Federal Highway Administration No. 20 of the Federal Highway System route designation. Tutuila is Route no. 1.
- \* The tsunami evacuation and escape routes have their pavement improved.
- \* The island road loop is unpaved and difficult to travel without four wheels drive vehicles. Since it is one single track needs several spots to allow vehicles to pass each other's and or back up and turn around.
- \* Only the road from the south end of the village to the elementary school is now paved in Aunu'u. There are no more funds currently for paving roads.

### Tsunami Evacuation Route

- \* The escape route is more inland and the Village did it

### Clinic

- \* There is no clinic yet for DOH on Aunu'u the building of DPW at the small boat harbor can be partially used as a clinic and dispensary to treat and immunize people by a nurse after some renovation and then DOE is in charge of maintenance. DPW can assist in the building structure and provide 1 room.

### Disability

- \* Disability access ramp to the small boat harbor would involve DPA.

### Road Work and Road Maintenance

- \* Accessibility provided by a paved road would be a consideration for tourism on the island, on the other side; a well maintained non-paved road could keep the place more pristine and attractive.
- \* Each territorial agency proposes to DPW what they need for roads.
- \* The Fono administers the Maintenance Funds
- \* CIP Priorities are for utilities, hospital, and education thus serving infrastructures and community facilities.
- \* The budget for all village roads in the Territory is \$380,000 from the Federal Highway Administration.
- \* Request to EDA are only for Manua and Tutuila no Aunu'u.
- \* Road must be put onto the Federal Highway System, after a request initiate by an agency
- \* There is no fund currently to pave the road of Aunu'u.

### Village Sidewalk

- \* The Village Improvement Fund of the Office of Samoan Affairs (SA) did village sidewalks.

\* Priority for roads is for the tourism and agriculture sectors to make those lands accessible.

Drainage

\* Drainage and flooding is addressed by DPW also to protect schools grounds.

E-Commerce

\* Connectivity e-commerce to be explored for Aunu'u and Manu'a



Fig. 40 The Four Planning Steps for Making a Village Plan



Fig. 41 Each Strategy is Evaluated with the SWOT Approach

**VILLAGE COUNCIL MEETING & SITE VISIT**  
**American Samoa Department of Commerce**  
**Aunu'u Island**  
**Scoping**

November 25, 2013

**PURPOSE:** Participatory approach to learn about (1) village economic development and employment needs, (2) family, private and public project collaborative initiatives, (3) building, and infrastructures requirements, and (4) sustainable land use design and village regulations, taking into account Samoan culture, lifestyle, environmental, climatic and ecological, factors and community resilience to natural disasters.

**OBJECTIVES:** Village Council and American Samoa Department of Commerce agree to participate in a pilot project toward creating a village plan document that translates a village vision for the future in doable program and projects for the island of Aunu'u.



AS DOC Participants: Keniseli Lafaale, Line Kruse, Kang Sevaio, Leifiloa Tanoi,  
Solialofi Tuamu and Luciano Minerbi

Planned Unit Development (PHD) Village Design and Ordinances  
Technical Assistance Project U.S. OIA  
**PROPOSED AGENDA:**

**MORNING:**

- \* Welcome and Pule
- \* Introduction of the Parties (DOC Staff and Village Leaders and Pulenu'u)
- \* Description of posted charts (planning process, community census profile, maps)
- \* Village Leaders and DOC Director share views

*Short Coffee Break*

- \* Small groups discussion by themes: (a) economy, (b) building & land use, (c) environment and posting of findings (concurrent session)
- \* Summary presentation by small groups

*Lunch Break*

**AFTERNOON:**

- \* Site Visit of village and island by identified issue areas
- \* Adjournment and Pule

(Note: the program was adapted so that site visit was conducted in a second visit

Field Trip to AUNU'U Nov 2013 Items to bring

THINGS TO BRING TO AUNU'U
FLIP CHART
COLORED MARKERS (to use on overlay tracing)
COLORED DOT STIKERS (to post on map)
TRACING PAPER
DIGITAL TAPE RECORDER
AUNU'U STATISTICS TABLES (Socio-Demo-Economic)
AUNU'U FLOOD INSURANCE MAP (JULY 1992 by Towill)
AUNU'U LAND USE MAP 1:24,000
AUNU'U VEGETATION AND SOIL MAP 1:24,000
AUNU'U BATHYMETRY MAP 1:24,000
AUNU'U
AUNU'U TOPO MAP 1:24,000
AUNU'U COUNTERS & ROAD FROM DOC/GIS
AUNU'U ESRI IMAGERY
AUNU'U LAND USE ALL LAYERS DOC/GIS Portal



FIELD TRIP TO AUNU'U ISLAND

MEETING WITH AUNU'U VILLAGE COUNCIL AND AUNU'U SCHOOL VICE PRINCIPAL

DOC Trip Participants: Kenisele Lafaele, Director DOC, Line Kruse, Acting Territorial Planner, Leifiloa Tanoi, DOC, Kang Sevaio DOC-GIS, and Luciano Minerbi UH-DURP

*Note: all what written below need to be checked for accuracy and sections need to be kindly added or completed where possible by other member of the DOC visit Team*

MEETING BY DOC WITH AUNU'U VILLAGE COUNCIL (Liné Kruse notes)

Director Lafaele spoke to the Audience:

- DOC is in Aunu'u to complete a report that will help Aunu'u Island and its people.
- This report will tell the Government on how to assist Aunu'u; help to explain how to use the land, what housing are needed, taro cultivation needs, or how much money is needed to do farms/homes projects.
- Use the information from this report to find grants and money for needed projects.
- Also give indications on how to look into Aunu'u taro production, processing and marketing and develop it further.
- Also want to see if Aunu'u can market its taro outside of American Samoa, maybe palagi's may want to buy it.
- Pacific Islanders that live outside of their home islands are a market to target that may want to buy this type of specialty crop.
- Also look at marketing Aunu'u taro to Apia (because they do not have this type of taro crop)
- There is need to find a way to improve the quality and life of the Aunu'u taro
- Aunu'u taro is such a specialty that it may be possible branding of Aunu'u alike it is done to the Alaskan salmon.
- If there's a way to package the Aunu'u taro like the Alaskan salmon, then the DOC is here to assist. The Aunu'u taro can become a specialty just from Aunu'u if its labeling is protected.
- Cocoa can be the same idea, it could be produced and processed.

Aunu'u Mayor response to Director Lafaele:

- Thankful to DOC Director to coming to Aunu'u to discuss these issues (marketing)
- Inaudible segments (speaker too far to hear from equipment)
- Something to do with the Marine Sanctuary?

Director Lafaele response to Aunu'u Mayor:

- Thankful for the questions. This report is not easy to do nor something to rush into.
- The Marine Sanctuary is held in Aunu'u, Manua, Futiga, etc. and that the Director and the Governor are looking into that, possibly decisions were rushed into concerning Sanctuary in Aunu'u.
- Also DBAS monies that will soon be available to fishermen and farmers in American Samoa (including tilapia).

Aunu'u Village Council questions to Director Lafaele:

- RE: DBAS, will these monies be used for some type of program (inaudible - rain)
- There will be 2 different uses of DBAS monies: One type is for loans and the second type is (inaudible - rain)
- Aunu'u is a special place, different from Tutuila. Workshops - Packaging for tourists
- What assistance will there be for farmers?
- There are serious issues post-tsunami in the land that has affected the Aunu'u taro. It is believed due to rising sea levels the taro has been affected and it's not the same anymore.

Director Lafaele response to Aunu'u village council:

- It's good to bring these issues to DOC with Dr. Luciano Minerbi. Dr. Minerbi has worked with watersheds in Hawai'i and has experience with tsunami work in American Samoa.
- Introduces Consultant/Professor Dr. Luciano Minerbi. Turns over the time to Dr. Minerbi to explain. Explains what kind of Professor Dr. Minerbi is.
- The purpose of DOC and with Dr. Minerbi is to make things move along in Aunu'u faster. DOC is coming to do the work to get from the stages of talking to the help you need – quicker. DOC wants to bring into Lutali Elementary math/statistics related subjects to better prepare the students for the longevity of academic careers (post secondary).
- In order to do this, DOC will need a space in Lutali Elementary to achieve these goals.

Aunu'u village council to Director Lafaele:

- Thankful to Director for the presentation.
- Food to follow presentation. Prayer for food.

Director Lafaale explaining to Dr. Luciano Minerbi the problems with Aunu'u taro:

- Taro disease (fungus?) also Aunu'u taro needs to grow in water. The swampy area is where the taro grows.
- The village council is glad for DOC and Dr. Minerbi to be here.

Dr. Luciano Minerbi presents framework for participatory collaboration to village council:

*Village participatory planning process*

Professor Luciano Minerbi spoke at the Aunu'u Council Meeting. He posted a flip chart describing the four steps of a participatory community planning process to come up with a village plan. He clarified that it would take several months to go through the steps (six month to one year), by engaging the community to study, reflect, and answer the four pertinent questions and generate the corresponding 4 written documents that would make up the village plan:

- (a) Community Profile - with socio-economic, land use, and environmental data
- (b) Trend Analysis – Probable Future Scenario: what happens without planning
- (c) A Desirable Vision for the Future of the Village- a plan for the future
- (d) A Village Action Plan – to use by the village and to give to government.

*Villagers prepare the village plan aided by facilitators*

After the Council agrees to engage in this village planning the next step is to assign a small planning team to lead and participate in the exercises. Staff of DOC (Soli Tuaumu) and NOAA (Fatima Sauafea) have participatory tools developed by the Participatory Learning and Action (PLA) Group that have been already used and work in the Samoan village communities. Then the Aumaga, Aualuma, the Church Groups, and the Local School can participate and execute projects with their respective area of interest and expertise, assisted by government agencies and NGOs were possible and needed.

*Use of the village plan by stakeholders*

To have a written plan goes a long way to establish the village's consensus about the future and to be in better position to secure partnership in public and private funding for needed projects because the synergy among projects merges and the projects are justified in their totality.

*Resource made available to the village Council by DOC*

Professor Minerbi left with the Council a copy of the Amouli Village Climate Resiliency Response and Action plan 2012-2015 done by the Amouli Resiliency Planning Committee, the American Samoa Coral Reef Advisory Group and the NOAA Fisheries Pacific Islands Regional Office, as an excellent example of a village participatory plan. He left with the Village Council a narrative description of the Aunu'u demographic profile from the US Census 2010 to illustrate the Aunu'u posted maps and as an example of what would go into the "population" chapter of

the Aunu'u Village Plan Document. Minerbi posted a flip chart with the suggested format for each village planning strategy to be described in terms of "What, Why, How, by Whom, When". This table should be filled in for each of the selected village strategy.

During the Council meeting Maps of Aunu'u Islands were displayed by the DOC Team as well as selected Statistical Tables from the US Census on the population characteristics in Aunu'u. These tables printed on a plastic banner were left with the Aunu'u Elementary School as useful data set for social / economic science study.

#### *The content of the Aunu'u Village Plan*

Minerbi clarified that the plan for Aunu'u should be broader to address, demographic, economic, social, environmental, land use, buildings, facilities, and infrastructure, so as to be comprehensive.

#### MEETING WITH AUNU'U PLANNING TEAM

After DOC director left the remaining members of the DOC team met with the Faipule and two other Members of the Aunu'u village Council. Some maps of Aunu'u were put on the table and used in the follow up discussion to address some of the concerns and suggestions made at the Village Council meeting. Some maps were left to the Aunu'u Council Members for their own use and return them at the next DOC Meeting with them.

#### FINDINGS AND SUGGESTED NEXT STEPS

The following findings and next steps emerge from a general scoping of issues in Aunu'u as well as those raised at the Aunu'u Council Meeting and the planning team meeting just after the council with the Failure and others.

*Comments or Next Steps: Kang, Theresa, Line' and Luciano to meet in a mapping exercise and produce a base map for Aunu'u locating problems, assets, and elements of a village activities, structures, and infrastructure to use at the next meeting with the Council Team working with DOC to fill in missing data.*

#### Community profile

##### Aunu'u Titles & Families

Fava, Saole, Tuisauma, Lemafa \*, Taufi \*, Taufolo, Talaimatai, Umi, Saau, Vaiaua, Sagatu, Mata'u, Lauvao \*, Sogale \*, Matila, Foromaitu\*, \* Vacant Title  
About 40 matai and 7 sa'o in Aunu'u (Source Theresa Lemalu)

##### Pulenu'u

Aunu'u Mayor Algea Nili (Waipuna)

*Comment or Next Steps: a map indicating the location of land parcels by family title for land use planning purpose would be useful to see which families would be involved in which desirable projects.*

## TRANSPORTATION

### Transportation Aunu'u -Tutuila

Daily Commuting for school and work is expensive

Round trip fare to Utulei \$8.00

Round trip to Tafuna \$10.00

Add lunch food the cost may be \$20/day

Charting the boat round trip for passage Tutuila-Aunu'u is \$50.00

### Staying Overnight in Tutuila

For the days of bad sea that boats cannot operate safely and serve the transportation needs of the island it would be good to find a family that can take care of traveller stranded overnight at Ampoule for those few days of bad weather, until service is restored. So perhaps finding a structure that can function for overnight stay, like a small motel.

The same need exist for people stranded at the airport in Tafuna when planes cannot take off because Aunu'u travelers may have no place to stay.

Document the need, describe and design the program, find willing family that can manage this small homestay-motel salutary accommodation.

(Source :Theresa Lemalu)

*Comments or Next Steps: May be some nearby religious college or school in Tafuna can provide dormitory room? Alternatively, some family may have extra room to adjust to temporary rooming as a modest and intermittent side income generating activity related to bad weather conditions.*

## COMMUNITY BASED ECONOMIC DEVELOPMENT

### Island Productivity Current and Potential

*Comments or Next Steps: Need to document island productivity existing and potential with taro, oranges, cocoa, mango, fishing, etc.*

*Document delineation of wetlands, cultivated land, cultivable land, settlement land, and conservation areas.*

### Taro Consumption

Taro is sold, not given; every family has some taro plot (usually two), for their own use. Taro was sold 10 years ago to the market. Not now. Taro is provided to the School Lunch Program (?) (Source Kang Seva)

*Comments & Next Steps: Family can be consulted if there is the interest and capacity to produce more for up sale, by producing, processing, packaging, branding, certifying non GMO, no pesticide, organic and selling it. Need to establish what would be the production volume total, minor subsistence and customary use. There are tools to calculate the amount of crop production for food security to feed a given village population based on human consumption need and food productivity of the land by*

*type of crop. Minerbi can provide such a calculation that was done by his students for the Village of Leone.*

### Taro Rot

The taro disease of the past that devastated the Aunu'u wetland was mentioned. *Comments or Next Steps: American Samoa Dept. of Agriculture, USDOA, and UH College of tropical Agriculture and Human Resources perhaps can help, there is a lot of technical research on taro health, infestation and water and fertilizers. These units could be contacted, for possible research and extension services.*

## COMMUNITY FACILITIES

### Church?

### Sport & Recreation?

### Clinic:

(Source: Aunu'u Representative and Leifiloa Tanoi)

*Comments: Need to learn the adequacy of facilities. Document the need to train midwife and first aid for a cadre of residents of Aunu'u to provide basic health care. Document the need for a clinic on the island the nearest one is in Amouli.*

### Stores

There are two stores in the island; they sell basic grocery with no frozen food that is bought on Tutuila. Everything cost \$1 more because of the transportation cost.

(Source Kang Seva)

### Schools

*Comments: The fact that DOC has adopted Aunu'u School provide an opportunity to collaborate in teaching and learning in addition to giving equipment or taking care of the grounds. An excellent approach is to orient the learning of basic reading, writing, math, and science subject to a place management approach. Fortunately there are examples of this in Hawai'i in the "Adopt an Ahupua'a" and on the Mainland USA, "Adopt a Watershed". Basically this approach provides a field study/research opportunity to apply academic topic that otherwise remain abstract. For example a school garden can be studied, the ecology of the island and of its part likes the cultivated sites, the wetland, the reef, etc. With kids involved, may be the parents get more involved too, it becomes an intergenerational learning opportunity. (Please See: Appendix A).*

## STRUCTURES

Find out the degree of hurricane resistance of building structures and to storm surge and tsunami damage

## INFRASTRUCTURES

### Public Work

*Comments or Next Steps: Need to know schedule public work projects for Aunu'u, maintenance and operation.*

*The road to the school is completed; it is being surveyed now for paying the contractor. Useful to assess the impact of the road and the access opportunity it provides.*

### Solid Waste and Landfill

The island shallow soil may be a problem for the landfill

(Source: Science teacher at the School)

*Comments: this is researchable topic, perhaps SPREP can assist JAICA has assisted the republic of Palau, perhaps there are useful research material on solid waste*

### Handicap Ramp

There is a need and desire to have constructed handicap ramp to access the boat at the peer.

### Bridge Linking Aunu'u to Au'asi

The possible construction of a bridge to link the island to avoid the commuting by boat was mentioned by the Representative (?)

*Comments or Next Steps: That is why bathymetric map may have been requested.*

*This would be extremely costly and with gigantic (and adverse) impacts on the people lifestyle and island ecology that a serious EIS scoping and community debates would be needed before even doing a full EIS.*

### Bathymetric Map

Aunu'u representative is interested in knowing the counter lines of the terrain around the island.

*Comments or Next Steps: DOC GIS can provide the representative with a bathymetric map that shows the isobaths.*

## ENERGY

### Renewable Energy

No renewable energy projects on the island?

### Gasoline Availability

Gasoline is brought and kept in gasoline barrels, tanks on the island (?)

*Describe how fuels is provided and managed in the island*

## WATER

### Water

There are 5 wells in the village one for each village sub-section.

What comes from wells on the island, and pipes from Tutuila, some houses collect rainwater, there are reverse osmosis water filter on the island (?).

(Source: Kang Seva)

*Comments: Document water quality, availability, quality and conditions water.*

## ENVIRONMENT

### Groundwater Conditions

Aunu'u Council member report that after the tsunami a drought come about that dried up the water basin of the wetland, adversely impacting the taro cultivation. People replaced the dry soil (?) Now it seems that the water is slowing coming backs.

*Comments or Next Steps: This is an interesting occurrence that scientists could study as it seems an interesting natural event that the tsunami actually drains the groundwater at least temporarily. In fact scientists are establishing that sea level rise does not only results in the flooding the coastal areas and in the receding inland of the coastline, but flood can occur inland because of the rise of the ground water. The UH Earth Science School is studying these matters for Honolulu. UH Manoa Prof. Fletcher, is also the one that conducted the tsunami simulation for Aunu'u Village, perhaps he can help to set up a research study to monitor the groundwater conditions in the taro area in Aunu'u. Also the UH Water Research Center has expertise in this, as well as in water for taro. Prof. Minerbi can contact these academic units if appropriate. The idea is to have funded research going on in Aunu'u, quite different enterprise than tourists, to which young residents can be exposed and participate.*

### Fishing

There is a need to stop Tutuila fisher from taking fish from Aunu'u

*Comment: subsistence or commercial or both?*

### Sanctuary Bottom Fish Fishing

*Comments or Next Steps: An issue is the ability of Aunu'u people to fish for bottom fish in the Marine Sanctuary, need to explore restriction, regulation and perpetuation of traditional fishing, distinguishing among Tutuila fishers and Aunu'u fishers and between subsistence fishing and commercial fishing. Protected subsistence fishing areas (Like Mo'omomi, Molokai, Hawai'i) is a way to protect the ecology but allowing residents of a locality to continue traditional subsistence fishing, one aspect of it is enforcement and possibility to train and deputize people of the place for regulation and enforcement.*

*May be Federal agencies may tend to apply a scientific continental approach to research that may not be so appropriate to small island ecosystems where man and nature coexisted in close proximity and symbiosis for 1000-3000 years.*

*Mainland scientists, in the vastness of the continent, like to re-establish total pristine ecological environment banning people from the area, like in wildlife habitats or by designating no fishing areas for baseline data collection, to use it as a control reference, but in small islands, in reality one could monitor instead different level of fishing intensity and practices and the concomitant condition of the ecosystem and fish in the sanctuary, and use that as the research and management focus. Could research on pristine conditions be done just in sanctuaries away from human habitation like on Rose and Swains atolls?*

### Aunu'u Sanctuary



According to NOAA The Aunu'u Island unit bears cultural resource significance due to a 19<sup>th</sup> century whaling vessel lost there. It also has a unique and vibrant patch reef system, and a coral shelf that provides a continuous habitat extending down to mesophotic reefs. The Aunu'u Island unit will be divided into two zones: A Multiple Use Zone (Zone A), where fishing would be allowed, and a Research Zone (Zone B), where all consumptive uses except trolling and surface fishing would be prohibited to provide a control area as a mechanism for research activities.

*Comments: In not yet done and practical, seek a project for underwater survey of the remains of the vessel (if still there) to augment the documentation of the history of the place already done by the Historic Preservation Office.*

#### NOAA Change to Fishing Restrictions at Aunu'u Unit, Zone B (Research Zone)

In the proposed rule (76 FR 65566), NOAA proposed to prohibit all forms of fishing in Zone B of the Aunu'u Unit in order to create an area devoted to scientific research on coral reef ecosystems. Many commenters pointed out that the area where Zone B is located was a highly sought-after area for recreational fishing of pelagic species, including for recreational fishing tournaments which bring in tourism benefits to the American Samoa economy.

NOAA's main goal for Zone B is to remove human impacts to the coral reef and its associated species for the purpose of research. Since surface fishing (including trolling) is not believed to have a strong impact on the coral reef and bottom-dwelling species of interest to NOAA, NOAA decided to allow such fishing in Zone B.

The depth of the area, the absence of spawning aggregation, and the absence of major topographic or oceanographic features indicate that there is likely to be enough vertical zoning that would allow for surface fishing to occur without having major impacts to the bottom reef ecosystem.

The intensity level of such fishing is unlikely to be significant, considering the small number of tournaments a year and low fishing pressure from the local population. The tournaments, while asserting small fishing pressure, provide valued tourism-based economic opportunities for the people of American Samoa.

Although a complete fishing prohibition would have been preferable for scientific research purposes alone, NOAA believes that allowing surface fishing is a more appropriate management scheme in Zone B to prevent inhibiting the small tourism benefits that fishing tournaments bring to American Samoa.

Fishing for bottom dwelling species, including trawling is prohibited. NOAA proposes prohibiting destructive gears and fishing practices, which will protect habitat and subsequently improve the overall ecosystem, while allowing traditional and other non-destructive fishing at all of the other units.

The multiple use zones at Aunu'u is an innovative technique suggested by the community that would incorporate traditional management intended to foster community stewardship while providing for compatible uses. If successful, NOAA could consider its use at other units and in other sanctuaries.

Other commenters felt that education was a better approach than asserting

federal control through regulations and fines to promote reef health. The sanctuary agrees with the value of education, but believes that education and outreach combined with a variety of management techniques, including enforcement of regulations, is the best approach

Source: Federal Register /Vol. 77, No. 144 /Thursday, July 26, 2012 /Rules and Regulations 43945

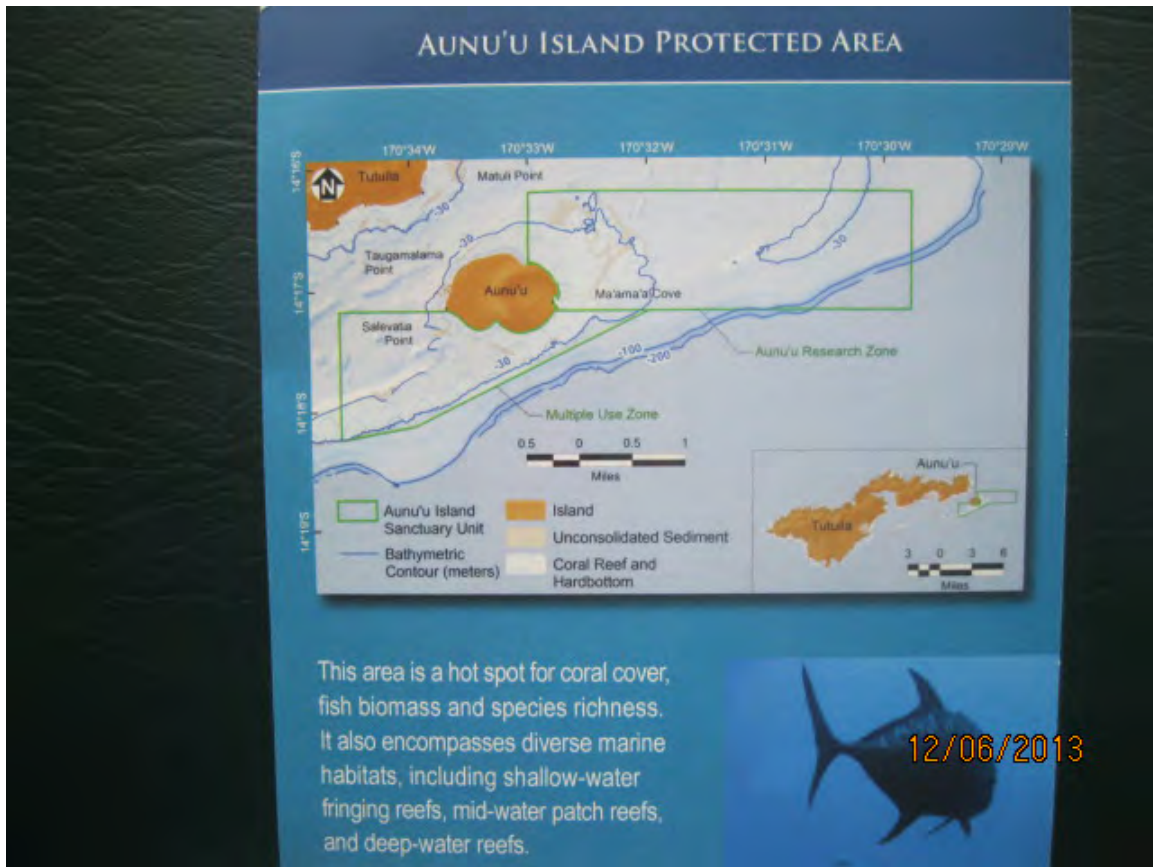


Fig. 42 NOAA Two Protected Area Near Aunu'u Island

**BACKGROUND**

Professor Marion Kelly of the Ethnic Studies Department, UHM developed the service-learning program, Mālama I Nā Ahupua‘a, in 1997-98, in collaboration with Professor Nelida Quenseil and Dr. Carl Heimer of KCC. The program was implemented in the fall of 1998 by Prof. Quenseil and Dr. Ulla Hasager under the guidance of Prof. Kelly. Activities are conducted in cooperation with our on-site community partners and community outreach coordinator, volunteer, Richard Uweolo Ribuca, who participate in all mandatory activities.

Living on islands gives a clear message to the need for responsible human interaction with the environment for anyone who dares to listen. Nevertheless, Hawai‘i’s environment and resources are in grave danger, not only because of large-scale mismanagement and development projects directed by motives of economic gain and political self-advancement, but also because of everyday use and lack of concern and knowledge. The rate at which the environment is being destroyed makes it urgent to educate the peoples of Hawai‘i to take responsibility and action to preserve what is left. We must create options for a sustainable use of the remaining resources.

The Mālama i nā Ahupua‘a service-learning program addresses these issues. We aim to develop a “sense of place” and environmental responsibility by creating a fund of knowledge and practical experience. An ahupua‘a is a traditional division of land, typically extending from the mountains out into the ocean to the reef. Within the ahupua‘a, the inhabitants traditionally had access to all the ecological zones of the islands and could get almost all they needed for survival. The ahupua‘a were self-sufficient and probably constituted political entities in early history.

The organization of the Mālama i nā Ahupua‘a service-learning pathway varies from most other options for service learning because of our emphasis on establishing a shared base of knowledge through common meetings and activities (“training”), usually taking up about half of the required service-learning hours. On this ground of common knowledge, the students build their own experience from the activities in which they participate, sometimes working in small groups.

The participating students come from a variety of levels and disciplines, such as botany, biology, sociology, anthropology, history, economics, political science, ethnic studies, and geography. Furthermore, our common projects often involve both younger and older age groups – and participants regularly bring children or other family members and friends. This is part of our efforts to reach out to the P-12 levels and to create a culturally appropriate, life-long learning experience, recognizing the importance of both families and hands-on learning in a Pacific Island context. This mix of age groups gives younger students, also the high school and intermediate students, good role models and creates confidence in a future transition into higher education.

We cover a wide spectrum of activities from hard manual labor to collection of oral histories. All activities, however, focus on the involvement of human beings with various aspects of the environment. The experiences and efforts of the students continue to contribute to building a fund of knowledge about the ahupua‘a of our islands.

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For detailed information about activities, updated scheduling (including same-day changes), and logistics, see MINA CALENDAR: <http://www2.hawaii.edu/~csssl/pages/ahupuaacal.html>

For information about the MINA Program and individual activities, forms, etc., see <http://www2.hawaii.edu/~csssl/>

Other helpful references and links: <http://www2.hawaii.edu/~csssl/> <http://apdl.kcc.hawaii.edu/~ahupuaa/botany/>

**MĀLAMA I NĀ AHUPUA‘A**  
**SERVICE-LEARNING PROGRAM**  
**FALL 2011**



Are you curious about the unique ecology and ethnobotany of our islands?  
Are you committed to sustainable use of the environment?  
Do you want to learn about the ecosystems of Hawai‘i and the interactions of organisms with their environment?  
Do you want to understand why knowing about traditional Hawai‘ian land and water use is important today?  
Do you want to understand the values of native species conservation and alien species eradication?  
Do you want to learn about changes in land use over time and how they affect the environment?  
Do you want to help take care of our environment?  
Do you want to work with local caretakers and stewards, as well as students and faculty from other disciplines and institutions?

... join us in the  
Mālama I Nā Ahupua‘a (MINA)  
service-learning program and Sustainability Initiative.

Fig. 43. Adopt a Watershed “Malama I Na Ahupua‘a” to Teach Students via Place Base Management Makes Learning Easier and Meaningful

## VILLAGE PARTICIPATORY PLANNING FORMS

**AUNUU SITE VISIT Dates:** \_\_\_\_\_

### Physical Planning and Land Use Reconnaissance FIELD NOTES

TOPIC	FINDINGS	NEXT STEPS
<p><b>Village Settlement</b></p> <ul style="list-style-type: none"> <li>* Walk Transect north south and</li> <li>* Walk Transect east-west</li> <li>* Depict built up area, activities &amp; land uses</li> <li>* Delimit perimeter of built up village area</li> </ul>		
<p><b>Open Space</b></p> <ul style="list-style-type: none"> <li>* Wetland: delimit perimeter of wetland</li> <li>* Taro cultivation: determine perimeter of cultivated area (the taro patches)</li> <li>* Locate potential expansion of cultivated areas (taro, fruit trees, other coco)</li> <li>* Locate perimeter of open space conservation areas</li> </ul>		
<p><b>Public Works</b></p> <ul style="list-style-type: none"> <li>* Locate water well</li> <li>* Locate garbage dumps sites</li> <li>* Locate infrastructures</li> <li>* Locate community facilities, evacuation safe center</li> <li>Locate storage tanks, pipelines, etc.</li> </ul>		

**AUNU'U SITE VISIT- DATE:** \_\_\_\_\_

**Physical Planning and Land Use Reconnaissance ---Suggested Tasks**

**Village**

Village settlement: walk transect north south and east-west to depict built up area and uses

Village settlement delimit perimeter of built up village area

**Open Space**

Wetland: delimit perimeter of wetland

Taro cultivation: determine perimeter of cultivated area (the taro patches)

Locate potential expansion of cultivated areas (taro, fruit trees, other coco)

Locate perimeter of open space conservation areas

**Public Works**

Locate water well

Locate garbage dumps sites

Locate infrastructures

Locate community facilities, evacuation safe center

Locate storage tanks, pipelines, etc.

**Zonation**

Determine buffers between

settlement - cultivated areas;

cultivated areas –conservation areas

settlement-conservation areas

residential –community facilities

**Risk Areas**

Determine areas or sites at risk from natural and man made disasters

**Escort DPW & ASPA staff in their well test etc.**

Learn from DPW & ASPA about their projects

**Talk Story Session with Villages**

Where are we?

Where are we going?

Where do we want to go?

How do we get there?

**Issue Map (participatory mapping)**

Map “what work” and “what does not work” for people and places in the island

### **Obtaining Data from the Community**

For the village plan of Aunu'u to progress local and indigenous knowledge must be mobilized and utilized to produce concrete deliverables that can be compensated by the OIA technical assistance or other grants because they generates essential commitments and data for program planning and business plan feasibility. This may involve a \$ allocation to obtain such deliverables:

1. Communal Land Tenure Map of Aunu'u Island: encourage the village council matai to produce a map with the names of the aiga landowners of the different village land sand plantation lands. To be used for settlement planning and economic development feasibility initiatives.

2. Current Cropping and Cultivated Areas by landowner families, coconut groves, fruit trees, laufala, taro, and vegetables.

3. Labor Force Availability Survey conduct a survey of who would and could engage in income producing activities, in fishing, farming, gardening, e-trade, handicrafts (fine mats etc.), etc.

4. Competition for Business or program Plans.

Encourage people in Aunu'u to submit project and business plan for income producing enterprises.

**Aunu'u Island Desirable GIS layers**

**A) Aunu'u and Salevatia Villages Settlement Physical Structure**

\*\* Buildings footprint & boundary of the urbanized village area

**B) Aunu'u Islandwide Island Infrastructures & Utilities**

- \* Paved road, unpaved roads
- \* Paved footpath and trails
- \* Tsunami escape routes
- \* Electrical lines and power distribution
- \* Water wells and water distribution system, water tank, and desalting plant
- \* Drainage system and sewage system
- \* Telephone & communication
- Landfill, and garbage dumping sites like those along the marsh
- \* Gasoline Deposit

\* Note: most GIS layers of all the above already exist-- Items marked "\*" should hopefully be obtainable from ASPA & DPW.

\*\* Note: See Map below probably done with CAD by ASPA depicting structures & utilities.



Fig 44 & Fig 45 Aunu'u Village building structures and infrastructures CAD Maps  
(like for road, power & water and sewage.

**C) Aunu'u Islandwide CZ Environmental Resources**

Boundary of the Wetlands where taro is cultivated (1) Palapalalooa, (2) Taufusilele Lolopapa Marsh (please include also the marsh near the school)

Boundary of the Faimulivai marsh (with inside the Red Lake) and Boundary of Pala Lake (Quicksand)

**Aunu'u Island Desirable GPS Field Survey**

D) GPS field-work and GIS Mapping of the Agricultural Areas Survey within the Taro wetland above the current cultivated taro field, the fallow fields and the old taro field UN-cultivated and covered by grass. The purpose is to estimate the acreage of potential expansion in crop cultivation See Map in Fig. 46.

Survey of the boundary of (a) tree crops (old coconut plantation and orange plantation). Survey only of the major vegetable garden area

The map of Fig 46 delineates the boundary of the settlement and the boundary of the wetland taro cultivation and the sub-boundary of the Cultivated and Uncultivated areas within the wetland that can be made precise with a GPS survey on the ground.

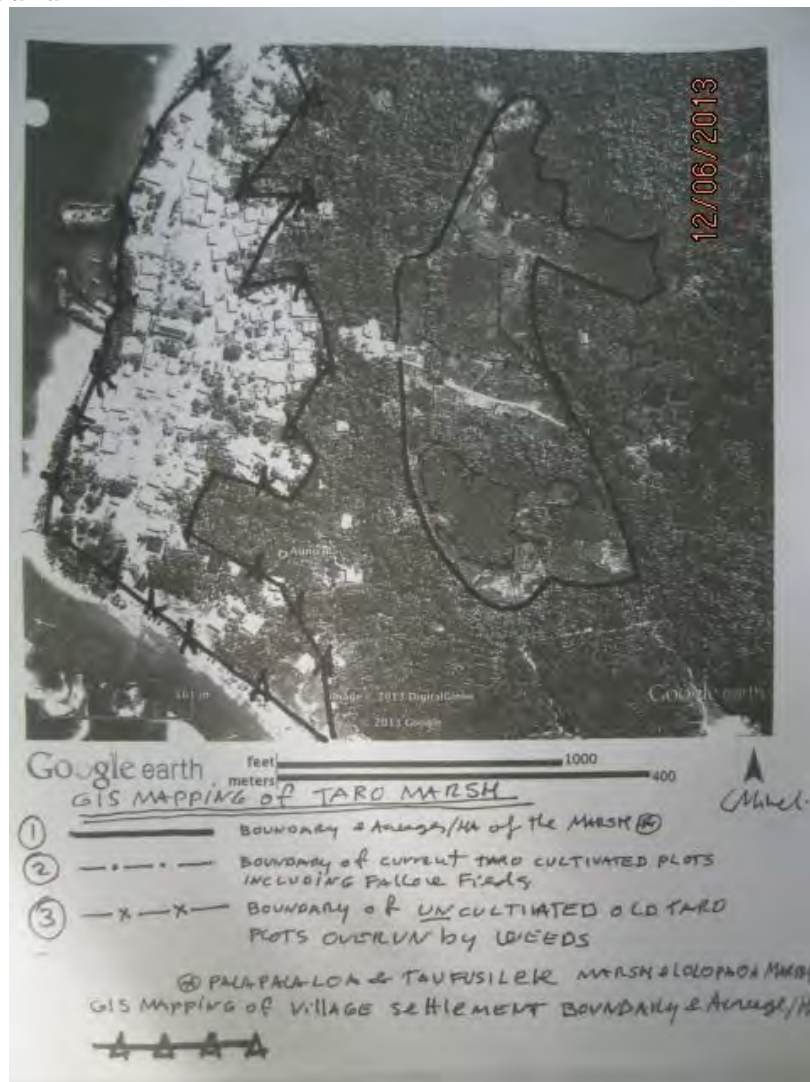


Fig. 46 Boundary delineation of the settlement and taro cultivated marsh



The Map of Fig. 47 shows how task C) Environmental Resources helps to derive a Land Utilization Map to be used for small scale economic development feasibility study for Aunu'u based on its resource endowment potential. Note the buffer zone between the settlement and farming are cultivated with wet taro.

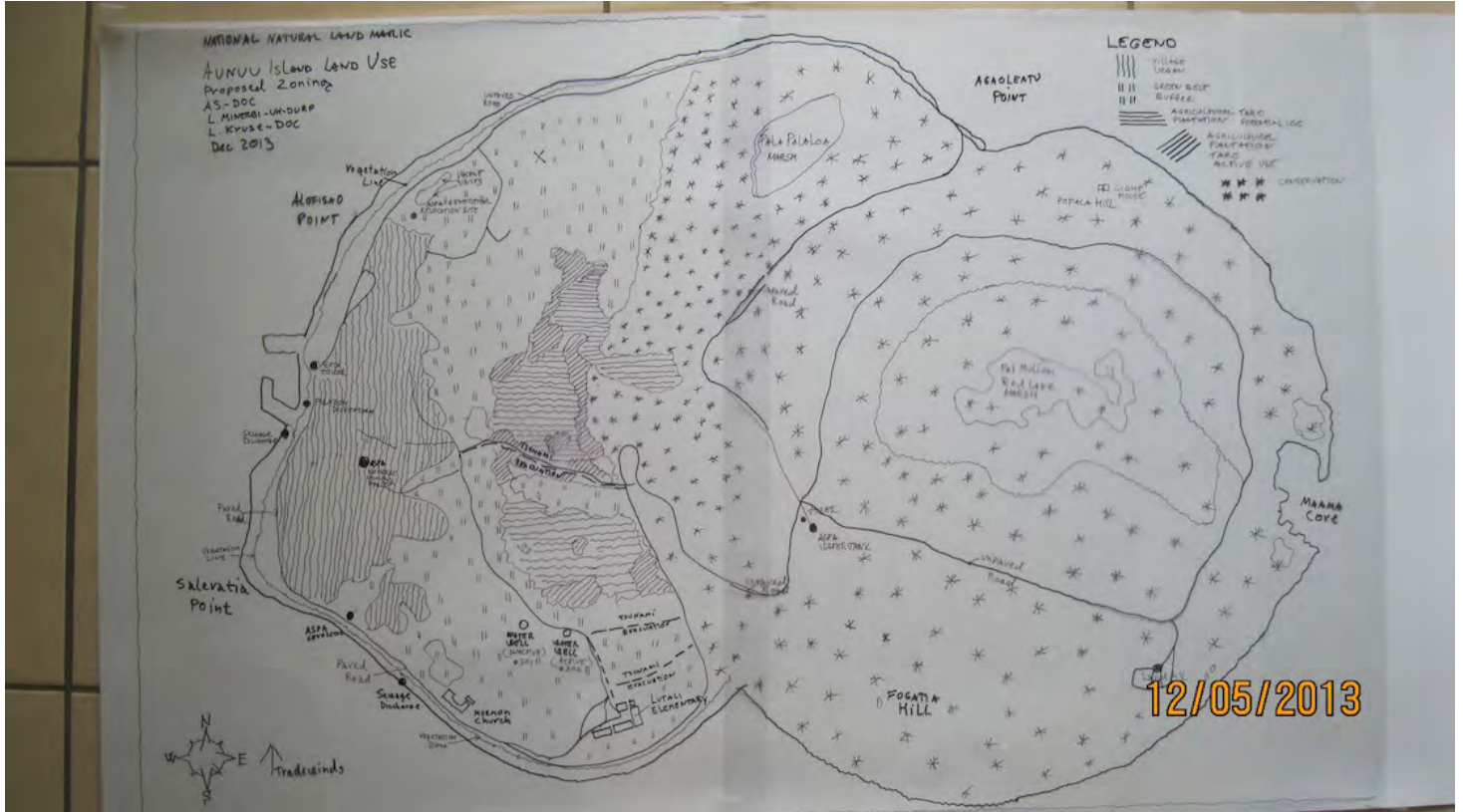


Fig 47 Aunu'u Island Land Utilization and Proposed Zonation Map (discussion only)

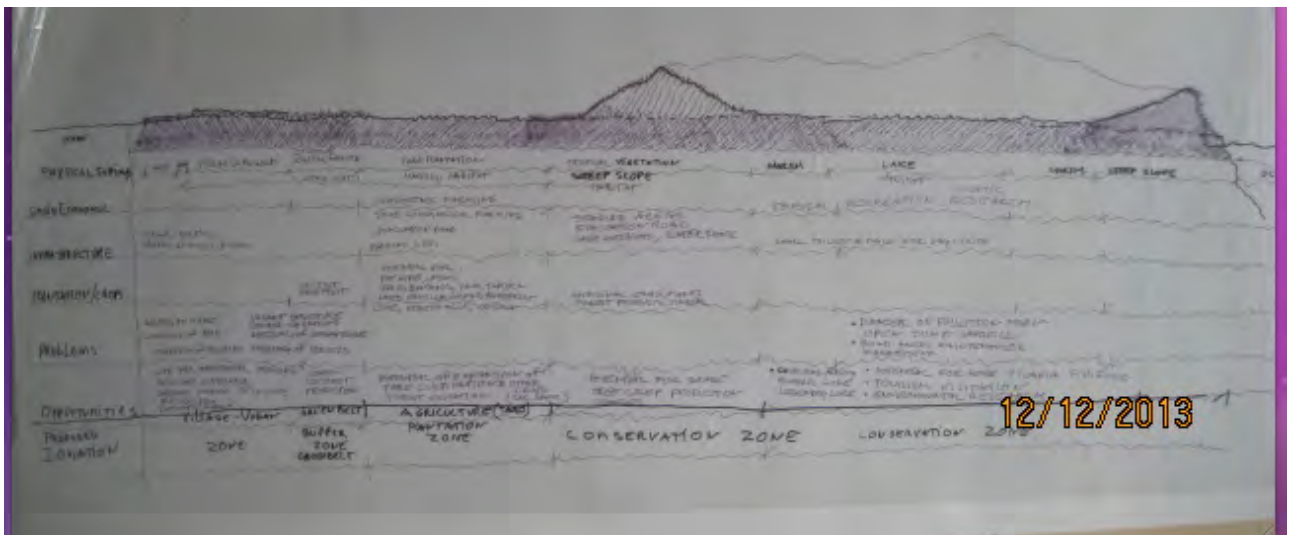


Fig. 48 Section West-East Transect from the Small Boat Harbor to the Maama Cove

## **Aunu'u Proposed Land Use Map Legend (for discussion only)**

### LEGEND

#### VILLAGE URBAN ZONE

The Village Urban includes the existing village area with building structures, both occupied and vacant structures, facilities, infrastructures --- the conventional urban uses, the port, and it envelope vacant or not utilized land that can accommodate additional structures if needed.

#### GREEN BELT BUFFER ZONE

The Green Belt Buffer is a section of land between the Village Urban and the Agricultural Taro Plantation (both active use and potential use), it is open space occupied by natural vegetation (coastal and littoral vegetation), trees, including coconuts. It gives breathing room and protection reciprocally to the settlement, the cultivated are and the conservation area. Some existing and scattered building structures already exists in this zone. Future structures here should be discouraged.

#### AGRICULTURAL PLANTATION ZONE

The Agricultural Plantation zone includes the past and current taro plantation field, it coincide with the wetland that allows the wet taro cultivation. An analysis of the GIS map would help to estimate the potential for additional cultivation by identifying the fallow fields now occupied by weeds.

#### CONSERVATION ZONE

The Conservation zone protects the dense tropical vegetation including the rare puzzonat tree. It includes all the land West of the Plantation zone and West of the Green Belt Buffer zone.

Specifically the Conservation zone includes the whole Palapalaloa, the quicksand mangrove swam, coastal swamp, the crater, the Fa'i Muliwai Marsh and mangrove swamp, coastal marsh (the Red Lake), and the whole Central-West side of the island the scenic Agoleatu Point with its natural arch, on the North Side, and the Maama Cove on the East,. These are storied site of the Aitu in the Pisaga region below the Fogatia Hill (99m.), of the legendary Samoan two lovers Sina Ma and Tigila'u at Maama Cove, and the two demigods and two sisters who were changed into stone at the Popala Hill (75m.). The old orange cultivation grove is within this zone to be grandfathered in and allowed to continue even with additional planting of other tree fruits. The Conservation zone does already contain some structures the Light House at Popala Hill, the Tower, the Water Tank, and the evacuation grounds at mid elevation below Fogatia. There are few simple wood structures with roof and poles that can be grandfathered in as they serve as disaster evacuation shelters and weekend outing and rest stations for some families. This zone also contains an open landfill that should be addressed to meet sanitary regulation, and possibly done away with it, because of the possible leaching into the soil and eventually into the Fa'ai Muliwai Marsh. .



Fig. 50 Aunu'u Names of the Wetlands.

### GIS and CAD Map Layers

GIS/IT, has created an online [google doc spreadsheet](#) outlining each of the layers from Minerbi's document and how we can go about obtaining/creating them. Many of these layers will require ASPA/DPW assistance. Others can be develop in house using the 2012 Imagery and LiDAR, some will require GPS surveys.

**Building Footprints/Paved roads:** GIS/IT can created and update both of these layers with the 2012 LiDAR and imagery. Both can be done in house and will perhaps will require a site visit to confirm. Creation of these layers (updated to 2012) would take approximately 3-5 full days for production.

**Utilities** (sewage, telephone, water wells, etc.): These layers will have to come from ASPA, ASTCA and DPW. These layers are in CAD format, hopefully they can be converted to GIS if those agencies have software for the conversion.

**Wetlands/Taro Survey:** What resolution do the taro fields and wetlands need to be mapped because this will greatly influence the methodologies and hence the turnaround time. Currently the wetlands for Aunu'u are very outdated (10-15 years). Does the project require the layers to be updated to 2012? If so, a couple questions:

- Are they areas going to be used to produce spatial analysis, calculation, modeling?
- Is there interest in the vertical component (elevation)?

-Our GPS and the LiDAR/Imagery will produce delineations that at the very least have a +/- 1 meters error, will that suffice for these delineations?

Aunu'u Island GIS Layers

File Edit View Search Format Data Tools Help View only

1 other viewer Comments

A	B	C	D
Task	Comments	GPS/Field Verification	GPS/Field Verification
<b>SECTION A</b>			
Building Footprint & boundary of the urbanized village area	2012 Layer can be derived from Imagery/LiDAR	NO	Bob
<b>SECTION B</b>			
Paved and unpaved Roads	Layer can be derived from Imagery/LiDAR	YES	Bob
Tsunami Escape Route	Layer exists on databank	NO	
Electrical lines and power distribution	Consult with ASPA, layer does not exist on DOC databank	YES	
Water wells and water distribution system, water tank and desalting system	Consult with ASPA/DPW, layer does not exist on DOC databank	YES	
Drainage system and sewage system	Consult with ASPA/DPW, layer does not exist on DOC databank	YES	
Telephone and communication	Consult with ASTCA, layer does not exist on DOC databank	NO	
Landfill, and garbage dumping sites	Layer potentially can be derived from Imagery/LiDAR	YES	
<b>SECTION C - Wetlands boundary - Taro mapping</b>			
Palapalaoa	Combination of LiDAR, Imagery and field surveys	YES	Kang
Taufusilele	Combination of LiDAR, Imagery and field surveys	YES	Kang
Lolopapa Marsh	Combination of LiDAR, Imagery and field surveys	YES	Kang
Faimulivai marsh	Combination of LiDAR, Imagery and field surveys	YES	Kang
Pala lake boundary	Combination of LiDAR, Imagery and field surveys	YES	Kang

Source: communications: Robert Kock to Luciano, Sandra, Line, Leifiloa, Solalofi, Kang, and Junior

**AUNU’U RESIENCY PLAN FOR DISASTER PREPAREDNESS  
 INFORMATION TO BE FILLED BY THE VILLAGE  
 VULNERABLE GROUPS FORM  
 FOR (1) WARNING, (2) RESCUE & (3) EVACUATION, (4) FIRST AID**

<b>Name</b>	<b>Household</b>	<b>Comments</b>
Pregnant Women		
Widow /Single Women Head of Households		
Disabled /Aged /Sick		
Residents in risk Prone Housing or Near Ocean		

Reference: Saanapu Village Management Plan, 2009.

### AUNU'U VULNERABILITY MITIGATION FORM

Main Hazards	Vulnerable Condition	Causes	Solution Possible	Options
1. Cyclone 2. Flooding 3. Earthquake 4. Tsunami 5. Drought 6. Waterspout 7. Storm Surge	1. Vulnerable location of buildings	Homes located Near sea	Relocate inland?  Build Seawall?	Relocate and Request assistance To move Government infrastructure Inland (roads, electricity, water supply etc.)
	2. Emergency Shelter		Assess adequacy of emergency shelter outside Hazard zone	
	3. Taro Plantation	Need to expand production Need to diversify crops Need to monitor ground water		
	4. Wetland Mangrove	Solid waste dumping	Clean up projects  Alternative collection sites	
	5. Sanitary Landfill			

Reference: Saanapu Village Management Plan, 2009.

**AUNU’U MITIGATION ACTION PLAN FORM**  
*To Be completed By Aunu’u Village Council and DOC*

<b>Item</b>	<b>Options</b>	<b>Activities to be Implemented</b>	<b>Resources Required</b>	<b>Responsibility</b>	<b>Timeframe / Date of Implementation</b>
Training Education					
Equipments Supplies					
Structures					
Infrastructures					
Etc.					
Etc.					

Reference: Saanapu Village Management Plan, 2009.

**AUNU’U RESILIENCY PLAN  
SELECTED STRATEGY FORM**

TOPIC

OBJECTIVE

RESPONSE & ACTION

LEAD PERSON AND GROUP

SUPPORTING PARTNERS

Reference: Amouli Village Climate Resiliency Response and Actions 2012-2015



**AUNU'U HISTORICAL PROFILE & TIMELINE FORM**

EVENTS/THREATS	1960-69	1970-1979	1980-1989	1990-1999	2000-Present
TROPICAL STORM & SURGE					
FLOODING					
DROUGHTS					
SOIL EROSION / LANDSLIDE					
EARTHQUAKE					
TSUNAMI					
FACILITIES & INFRASTRUCTURES					
TRANSPORTATION & UTILITIES					

**VILLAGE OF AUNU’U  
TRAINING NEEDS FOR ‘AUMĀGA AUALUMA FORM**

NEEDS & TEAMS	RESOURCES AVAILABLE	REQUIREMENTS
Warning		
Rescue & Evacuation		
Shelter Management		
Security		
Sanitation		
First Aid		
Rehabilitation		
Counseling		

**Village Contingency Fund**

Process	When	Responsible Person
Fundraising Contribution by Families Financial Reporting		

**Drill Plan**

Hazards	When	Responsible Person
Cyclone Flooding Earthquake Tsunami Droughts Waterspout Storm Surge		

Reference: Saanapu Village Management Plan, 2009.

# DOC spearheads 1st ever assessment of Aunu'u's economic development needs

by Samoa News staff

The Commerce Department is leading the government initiative to assess the economic development needs for Aunu'u, the first known type of economic development assessment for the island-village, whose economic base is dependent mostly on taro plantations.

According to a DOC news release, the move comes amid the success of the governor's Adopt-A-School initiative which not only forged partnerships between ASG agencies and the Department of Education but has also brought together ASG agencies to determine sustainable economic development opportunities in Aunu'u.

Hand in hand with the Aunu'u village council, DOC is leading the project to "assess the needs for planned use development and economic village based initiatives" which engages all stakeholders with the ASG agencies to provide meaningful actionable plans in Aunu'u.

"This model of collaboration will be replicated in Ta'u, inclusive in their development plan," said DOC, whose Adopt-A-School is A.P. Lutali Elementary School on Aunu'u.

"Aunu'u and Manu'a islands present different challenges and assessment of needs that require dialogue and commitment not just by the ASG agencies but also in partnership with the villages and village councils," said DOC director Keniseli Lafaele.

Acting territorial planner Liné-Noue Kruse authored several Department of Interior grant proposals that were awarded to ASG, and one grant is now funding the work that is being done in Aunu'u, and will be implemented in Manu'a.

Lafaele said the work in Aunu'u is in progress and there is much to be done, but a great deal has already been accomplished with the partnerships in Aunu'u and amongst ASG agencies.

"Sustainable economic development projects must be pursued with the village council in order to solve these challenges," he said. "This ASG partnership with the Aunu'u village focusing on economic and land development has quickly materialized into realistic yet constructive dialogue of what is possible in Aunu'u."

Lafaele and his staff, along with Tafuna Industrial Park manager Misipati Salanoa, Liné-Noue Kruse, University of Hawai'i professor of planning and architect Dr. Luciano Minerbi, project lead Leifiloa Carol, and GIS technician Kang Sevaio (Aunu'u resident) have met with Aunu'u Rep. Talaimatai Elisara Su'a, Aunu'u mayor Aleaga Nili, and the village council "to solidify this partnership, expected outputs, and goals of this work in Aunu'u which has already produced a

report from the village council to DOC on the needs and economic opportunities in Aunu'u.

Director of Education Vaitinasa Dr. Salu Hunkin-Finau authorized a space at the A.P. Lutali Elementary for the DOC to work closely with the Adopt-A-School program and to coordinate and implement economic initiatives in Aunu'u.

"It is the intention of the DOC to engage administrators, teachers and students of A.P. Lutali Elementary in shaping the outcome of the economic development of their community," said Lafaele.

DOC said it sought out ASG intra-agency collaboration on what implementation framework will be needed to address economic opportunities in Manu'a as well as address economic initiatives in Aunu'u to further the project.

ASPA Executive Director Utu Abe Malae, ASEPA director Ameko Pato, DPW director Faleosina Voigt, and ASHPO director David Herdrich are collaborators on the project to assess economic and land opportunities in Aunu'u.

ASG's team that was present during a site visit last Wednesday with Rep. Talaimatai included Pato, ASEPA Deputy Director Fa'amao Asalele, water specialist Casuallen Fale, ASPA water division manager Taylor Savusa, and water chief operator Danielle Meleah.

The site visit explored what challenges and opportunities exist to develop any desired sector by the village council in coordination with DOC.

Historically, said DOC, the two main sources of economic activity for the Aunu'u people for the last fifty years are taro and making "faausi", a Samoan food item, which is made of taro (or tapioka).

(Samoa News should point out that not mentioned in the media release is the "special" taro Aunu'u is historical known for — a dark purplish taro, grown in Aunu'u's swamp area — which many "old timers" describe as having the smooth texture when eaten of "pulukamu" or "bubble gum", while still tasting like taro or tapioca.)

DOC said the Aunu'u village council submitted to them their economic development challenges, identifying agriculture as a challenging sector to advance. "The two main challenges identified is the declining motivation for young men and women to work the taro plantation and the fau tree invasion on the taro plantation," said DOC.

Adding to the challenges of agricultural production is the belief that there is a disease affecting the taro plantations and possible leaching of lead from the scrap metal in the landfill that is hurting the

tilapia.

The identified prioritized needs for the island are an elementary school van, passenger vessel, health clinic, cement road around the entire island connected to their evacuation routes, and fortified sea wall from the wharf to the A.P. Lutali Elementary school.

DOC said it has already moved on the agricultural segment of economic opportunity by developing zoning maps by Kruse and Minerbi to recommend zonation that will demarcate the existing urban area from the areas of conservation and agriculture to ensure longevity to any agriculture intensification program.

Coastal zone manager Sandra Lutu is sending GIS technicians Kang Sevaio and Robert Koch to conduct GPS mapping of the agricultural lands and urban areas to survey how much lands are actually being farmed for agricultural purposes and what lands are then left for possible intensification of taro, mango, moli, pineapple, banana, peas, cucumber, and pumpkin.

The GPS mapping will assist the village, DOC, and other ASG agencies to understand what is currently being farmed and used for family consumption, thereby ensuring food security for the island and what lands are available for intensification of commercial export.

The existing taro cultivation is currently being done on communal lands which the communities must identify human resources that exist on island to commit to agricultural intensification programs.



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Naumati Room, Tradewinds Hotel

David Robinson, current Chairman, will be Reviewing our 2013 highlights.

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If you wish to be on the ballot, require proxy forms, or need other information, please contact:  
Laua'i Fanene at 770-5086, or  
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