

**NOAA Technical Memorandum CRCP 24**

**National Coral Reef Monitoring Program  
Socioeconomic Monitoring Component**

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**Summary Findings for American Samoa, 2014**



NOAA Coral Reef Conservation Program

Silver Spring, MD

**March 2016**



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United States Department of  
Commerce

Penny S. Pritzker  
Secretary

National Oceanic and  
Atmospheric Administration

Dr. Kathryn Sullivan  
Administrator

National Ocean Service

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# National Coral Reef Monitoring Program Socioeconomic Monitoring Component Summary Findings for American Samoa, 2014

A. Levine, M. Dillard, J. Loerzel and P. Edwards  
National Oceanic and Atmospheric Administration

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## About this document

The mission of the National Oceanic and Atmospheric Administration (NOAA) is to understand and predict changes in the Earth's environment and to conserve and manage coastal and oceanic marine resources and habitats to help meet our Nation's economic, social, and environmental needs. As a branch of NOAA, the National Ocean Service (NOS) conducts or sponsors research and monitoring programs to improve the scientific basis for conservation and management decisions. The NOS strives to make information about the purpose, methods, and results of its scientific studies widely available.

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A **NOAA Technical Memorandum NOS** may be cited using the following format:

A. Levine, M. Dillard, J. Loerzel and P. Edwards. 2016. National Coral Reef Monitoring Program Socioeconomic Monitoring Component. Summary Findings for American Samoa, 2014. U.S. Dep. Commerce., NOAA Technical Memorandum CRCP 24, 80 p. + Appendices. doi:10.7289/V5FB50Z1

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## **Acknowledgements**

The project investigators would like to extend our appreciation to many individuals and groups that made this work possible. They include: Stacey Kilarski, who coordinated field data collection and assisted with preliminary data analysis, Fatima Sauafea-Le'au, who helped coordinate with the office of Samoan Affairs and mayors in the survey villages, the many members of the Coral Reef Advisory Group, who provided input to refine the survey, and the capable team of household interviewers in American Samoa. We would also like to thank our reviewers Angela Orthmeyer, Stewart Allen and Fatima Sauafea-Le'au for their valuable comments. Finally, the NCRMP Social Science Team wishes to extend our appreciation to all of the colleagues we have worked with along the way for their support, ideas, and efforts toward the greater goal of long term socioeconomic monitoring of our nation's coral reef states and territories.

## **Executive Summary**

The Socioeconomic Component of the National Coral Reef Monitoring Program (NCRMP) is currently in the process of monitoring socioeconomic indicators across all U.S. coral reef territories and jurisdictions. These indicators include the demographics of these areas, human use of coral reef resources, as well as knowledge, attitudes, and perceptions of coral reefs and coral reef management. The overall goal of this endeavor is to track relevant information regarding each jurisdiction's population, social and economic structure, society's interactions with coral reef resources, and the responses of local communities to coral management. NOAA's Coral Reef Conservation Program (CRCP) will use the information for research, to assess the socioeconomic outcomes of management activities, and to improve the results of programs designed to protect coral reef resources.

This report outlines human dimensions information relevant to coral reef resources in American Samoa. The findings here are derived from a combination of data gathered through household surveys conducted in February 2014, and additional secondary sources of socioeconomic information for the jurisdiction. Surveys demonstrated that participation in recreational coral reef related activities such as SCUBA diving and snorkeling is relatively uncommon in American Samoa, with the exception of swimming and beach recreation. However, over half of residents participate in fishing or gathering of marine resources. Residents of urban areas perceived coral reef ecosystem health to be in worse condition than residents of rural areas. Additionally, surveys revealed that American Samoans generally support current marine management policies and regulations, regardless of their reliance on marine resources, and are generally trusting of the government as a source of information.

Like several coral reef jurisdictions, the population of American Samoa declined between 2000 and 2010. The jurisdiction faces a number of social challenges. GDP has declined in American Samoa in recent years, and over half of the population has incomes below the poverty line. Infrastructure, particularly for the treatment of sewage and water, remains limited.

There were a few lessons learned from this first NCRMP socioeconomic data collection in American Samoa. As similar surveys are implemented across other U.S. coral reef jurisdictions, the NCRMP team will be making adjustments to the data collection effort to improve on the type of information being generated. These findings can be considered as a starting point to develop more detailed research questions for future work.

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## List of Acronyms

|       |   |
|-------|---|
| BEA   | Bureau of Economic Analysis                     |
| CRCP  | Coral Reef Conservation Program                 |
| GDP   | Gross Domestic Product                          |
| GED   | General Education Development                   |
| KAP   | Knowledge, Attitudes, and Perceptions           |
| MEA   | Millennium Ecosystem Assessment                 |
| MLF   | Municipal Land Fill                             |
| MMA   | Marine Managed Area                             |
| MPA   | Marine Protected Area                           |
| NCCOS | National Centers for Coastal Ocean Science      |
| NCRMP | National Coral Reef Monitoring Program          |
| NOAA  | National Oceanic and Atmospheric Administration |
| NOS   | National Ocean Service                          |
| OEI   | Office of Environmental Information             |
| OMB   | Office of Management and Budget                 |
| SCUBA | Self-Contained Underwater Breathing Apparatus   |
| US    | United States                                   |
| USEPA | United States Environmental Protection Agency   |
| WHO   | World Health Organization                       |
| WWTF  | Wastewater Treatment Facility                   |

## **Introduction**

In 2007, the NOAA Coral Reef Conservation Program (CRCP) underwent an external review by an expert panel to provide an independent assessment of the CRCP's effectiveness in meeting its mandates and to suggest recommendations for future improvement. One of the major recommendations of the external review was to increase the CRCP's social science portfolio and use social science strategically to improve coral reef management by engaging local communities and by better assessing the social and economic consequences of management policies, interventions and activities on local communities. In 2010, the CRCP added a socioeconomic monitoring component to the National Coral Reef Monitoring Program (NCRMP) to improve its ability to track social science information in coral reef jurisdictions. NCRMP is an integrated long-term program designed to monitor the condition of coral reefs and coral reef ecosystems. The program now conducts sustained observations of biological, climatic, and socioeconomic indicators in U.S. states and territories where coral reefs are present. The main purpose of the Socioeconomic Component of NCRMP is to answer the following questions: What is the status of human knowledge, attitudes, and perceptions regarding coral reefs? And, how are human uses of, interactions with, and dependence on coral reefs changing over time?

The *CRCP Social Science Strategy* (Loper et al. 2010) recommended three priority activities: developing of a set of national-level social science indicators, collecting these indicators via regular and repeated jurisdictional surveys, and increasing social science capacity within the coral reef conservation program. The socioeconomic component of NCRMP addresses the first two priorities. The inclusion of socioeconomic indicators in the NCRMP represents a strong step forward for the CRCP, which has recognized the need to integrate socioeconomic information with biophysical indicators relevant to the conservation of coral reef resources. Integration of socioeconomic information will strengthen national coral reef monitoring and improve the Program's ability to explain how people interact with coral reef resources, as well as how coral reef ecosystems and coral reef management strategies are perceived by the public -- issues of utmost interest to our partners, resource managers, and policy makers.

## **Purpose of this Report**

This technical memo presents the findings from the initial American Samoa NCRMP socioeconomic data collection. The report presents preliminary social indicators and provides examples of how they can be analyzed over the long term. It should be noted that this report presents information that, in many instances, is being collected for the first time. In all instances, the information represents baseline socioeconomic data for the NCRMP. Some of the variables presented in this report identify gaps in information, and we provide suggestions on how these

can be addressed in the future. The main objective is to lay the groundwork for combining and comparing socioeconomic variables with a goal of developing meaningful indicators that can be used to examine trends in human dimensions of coral reef resources and better understand human influences on effective coral reef conservation.

## **Overall Approach of the Socioeconomic Component of NCRMP**

The socioeconomic component of NCRMP gathers and monitors a collection of socioeconomic variables, including demographics in coral reef areas, human use of and their interactions (over time) with coral reef resources, as well as knowledge, attitudes, and perceptions (KAP) of coral reefs and coral reef management. The overall goal is to track relevant information regarding each jurisdiction's population, social and economic structure, society's interactions with coral reef resources, and the responses of local communities to coral management actions. The Coral Reef Conservation Program will use the information for research, to assess and monitor socioeconomic status and change over time, to assess the socioeconomic outcomes of management activities, and to improve programs designed to protect coral reefs within each jurisdiction. Ultimately, in consultation with stakeholders, partners and other scientists, the information collected will inform the development of indicators. Each indicator will be created using data from surveys of residents in the US coral reef jurisdictions and from existing socioeconomic data collected from secondary sources such as the US Census and local government agencies. These indicators will include information about the population, the social and economic structure, the impacts of society on coral reefs, and the contributions of healthy corals to nearby residents. The indicators can also be used to track the status of human knowledge, attitudes, and perceptions regarding coral reefs and management activities related to coral reef resources. The indicators and the rationale for selection are provided below in Table 1.

### ***Primary Data Collection***

Primary data for the socioeconomic component of NCRMP is collected via a survey administered to individuals reporting on behalf of their households. The survey instrument is composed of one set of questions that is the same for all U.S. coral reef jurisdictions, as well as a sub-set of jurisdiction specific questions relevant to local management needs. NCRMP socioeconomic data are collected using a variety of modes as appropriate to the context in each jurisdiction. For example, in American Samoa, in-person household surveys in Samoan and English were employed. For all jurisdictions, the aim is a representative sample of the population that meets a 95% confidence level. The survey methodology generally follows Dillman's Total Design Method (Dillman 2007). It should be noted that the survey was developed by utilizing questions from a "bank" of over 120 questions. These questions were also approved for use by the Office of Management and Budget which is responsible for administering the Paper Work

Reduction Act (1995), the main purpose being to ensure that the public is not unduly burdened (time) and confidentiality is assured. Surveys are planned to be repeated in each U.S. coral reef jurisdiction after the completion of a full monitoring cycle, approximately once every seven years.



**Primary Data Collection (Stacey Kilarski)**

## ***Secondary Data Collection***

The use of secondary data is ideal for the development of a sustainable, cost effective, and long term socioeconomic monitoring plan. Secondary data collection involves compiling data that was collected by other organizations from multiple sources and across US coral reef jurisdictional geographies into a centralized database. The use of data sources that are collected in a standardized way over time (such as census data) can help facilitate the integration of social, economic, and biophysical data collected under NCRMP.

It should be noted that the data presented in this report represent the current status of the collection, ultimately intended to contribute to the development of indicators. Once developed, these indicators will be used to assess all US coral reef jurisdictions at the conclusion of the first full monitoring cycle. The primary and secondary data presented in this report serve as a snapshot of the collection and analysis of the NCRMP socioeconomic monitoring component for American Samoa in 2014.

## ***Indicator Development***

The indicators identified in Table 1 will be developed by combining data from primary and secondary sources. The assessment of all US coral reef jurisdictions will draw on composite indicators that may be comprised of multiple distinct measures getting at the same higher level concepts such as ‘Attitudes towards coral reef management strategies’. For example, indicators for the well-being of populations living in US coral reef jurisdictions will be developed using the NCCOS framework and methodology developed by Dillard, Goedeke, Lovelace, and Orthmeyer (2013), which established a methodology for creating composite indicators of well-being in coastal communities. The development of composite indicators is currently underway. Box 1 provides a description the conceptual framework for developing the community well-being indicator, as an example of the multiple measures that go into developing a single composite indicator.

## BOX 1 Composite Indicator: Community Well-being

Well-being is a concept used to assess the status of people, either individually or collectively, at different scales (e.g., individual, community and national; Costanza *et al.* 2007). Well-being assessment can be used to determine how people are doing in relation to an optimum standard of life experience (Doyal and Gough 1991) and are generally used by decision-makers to inform policies and programs focused on improving the societal conditions. It provides a means of tracking the relationship between communities and the environment, and a better means of understanding the ecosystem as a whole. When the environment is providing ecosystem services that communities need and desire, well-being has positive gains. Conversely, if there is decline or disruption in ecosystem services, we may expect a decline in well-being, particularly with increased dependence on these services (Butler and Oluoch-Kosura 2006; Costanza *et al.* 1997; MEA 2005). Being able to predict the consequence to humans, both positive and negative, associated with changes in ecosystem states is critical to informed management.

Eight composite indicators that can ultimately be tracked alongside coral reef ecosystem condition will be employed. The composite indicators are shown in the figure below. Each composite indicator is conceptually complex. At the conclusion of the first monitoring cycle, the coral reef jurisdictions like American Samoa will be scored on each indicator of well-being. These scores will then be used in statistical analyses with indicators of environmental condition to analyze the dynamic relationship between the ecosystem services that people regularly enjoy and community well-being.

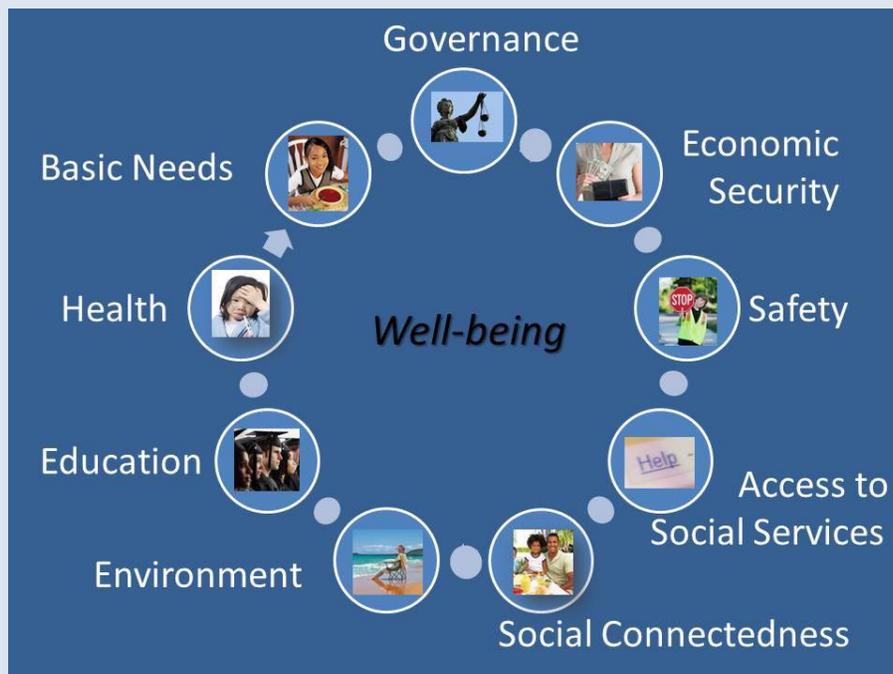


Figure 1 Framework of composite indicators for well-being and ecosystem condition, adapted from Dillard *et al.* 2013

**Table 1 NCRMP Socioeconomic Indicators**

|    | <b>Indicators</b>   | <b>Rationale</b>   |
|----|---|--|
| 1  | Participation in coral reef activities (including snorkeling, diving, fishing, harvesting)                        | Participation in coral reef activities enhances understanding of the economic and recreational importance of coral reefs to local residents as well as the level of extractive and non-extractive pressures on reefs         |
| 2  | Perceived resource condition  | Assessment of perceived conditions is an excellent complement to biophysical information and key to understanding support for various management strategies  |
| 3  | Attitudes towards coral reef management strategies  | Monitoring this information over time will be valuable to decision makers  |
| 4  | Awareness and knowledge of coral reefs  | Monitoring this information over time is key to tracking whether CRCP constituents understand threats to coral reefs and will help inform management strategies (and education/outreach efforts)                             |
| 5  | Human population trends (change) near coral reefs   | Monitoring human population trends is important for increasing pressure on coral reefs, as well as reef-adjacent populations   |
| 6  | Economic impact of coral reef fishing to jurisdiction   | Tracking the economic contributions of coral reefs can help justify funds allocated for coral reef protection  |
| 7  | Economic impact of dive/snorkel tourism to jurisdiction   | Tracking the economic contributions of coral reefs can help justify funds allocated for coral reef protection  |
| 8  | Community well-being  | Tracking changes in health, basic needs, and economic security enhances understanding of linkages between social conditions and coral reefs  |
| 9  | Cultural importance of coral reefs  | Measuring cultural importance improves understanding of traditional and cultural significance of coral reefs to jurisdictional residents and whether this is changing over time  |
| 10 | Participation in behaviors that may improve coral reef health (e.g., beach cleanups, sustainable seafood choices) | Measuring participation improves understanding of positive impacts to coral reefs as well as negative impacts  |
| 11 | Physical Infrastructure   | Assessment of coastal development footprint, physical access to coastal resources, waste management and water supply infrastructure provides general understanding of human impact on the coast                              |
| 12 | Knowledge of coral reef rules and regulations   | Tracking this information over time at the jurisdictional/national level will inform investment in education and outreach  |
| 13 | Governance  | Measurement of governance provides information on the current status of local institutions involved in coral reef conservation, number of functioning management strategies and percent area of coral reefs under protection |

## Geographic Scope

Overall, the NCRMP focuses on the Coral Reef Conservation Program’s geographic priority areas; however, as some of those areas are uninhabited, the socioeconomic variables are collected from only the inhabited areas. Geographic sampling units for the socioeconomic component of NCRMP are presented in Table 2. When feasible, indicators formulated at the sub-jurisdictional scale will be reported alongside biological indicators collected at the same scale. Efforts will be made to ensure sufficiently robust sample size to allow for reporting of socioeconomic indicators at appropriate sub-jurisdictional scales.

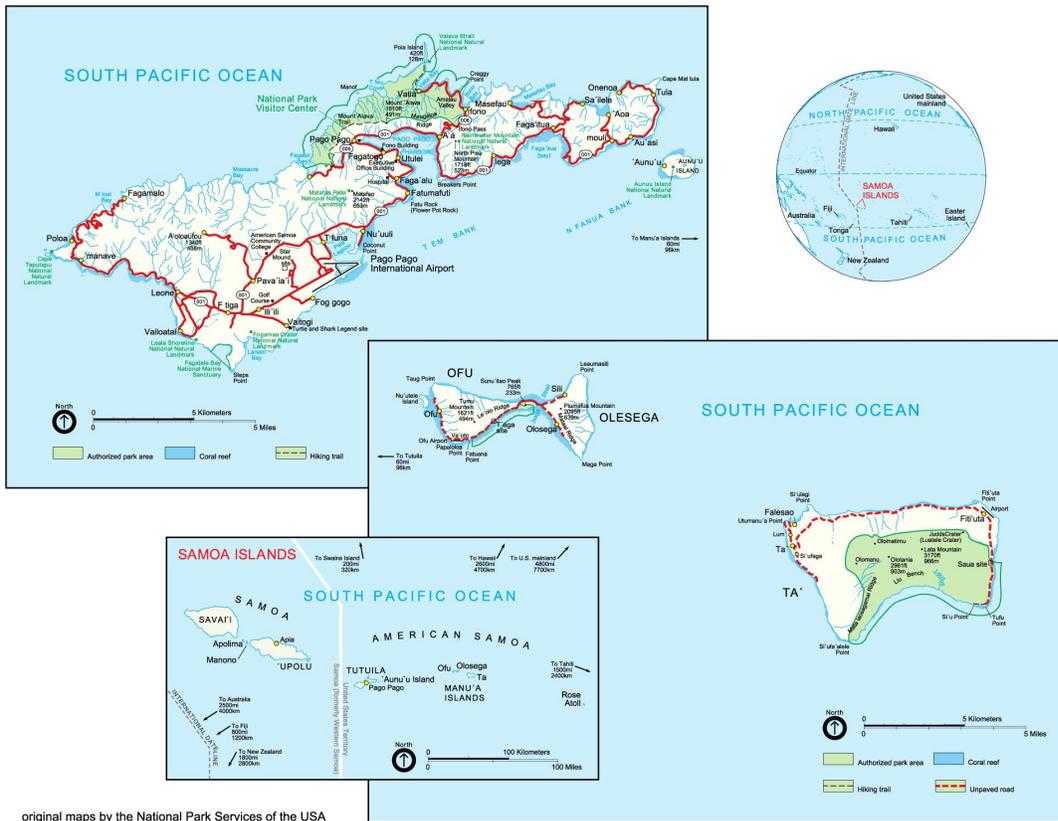
**Table 2 Geographic scope of NCRMP Socioeconomic Monitoring**

| <b>Location</b>                                     | <b>Sampling Units</b>  |
|---|--|
| <b>American Samoa</b>                               | Island of Tutuila*   |
| <b>Commonwealth of the Northern Mariana Islands</b> | Islands of Saipan, Tinian and Rota only                      |
| <b>Guam</b>   | Entire island of Guam  |
| <b>Hawai’i</b>                                      | Islands of Oahu, Maui, Hawaii, Kauai, Molokai, Lanai         |
| <b>Florida</b>                                      | Martin, Palm Beach, Broward, Miami-Dade, and Monroe Counties |
| <b>Puerto Rico</b>                                  | Puerto Rico, Vieques, Culebra Islands                        |
| <b>United States Virgin Islands</b>                 | St. Croix, St. Thomas, and St. John                          |

Note: \*The Manu’a islands will be added in the future but were not included in this round of surveys

## Jurisdiction Description

American Samoa is an unincorporated territory of the United States and is the country’s southernmost jurisdiction. American Samoa is located 14 degrees south of the equator in the Pacific Ocean, about 2300 miles south-southwest of Hawaii (Figure 2). American Samoa lies just east of the international dateline and is part of the Samoa Archipelago. It is made up of seven islands: Tutuila, Aunu’u, the Manu’a group (about 100 km east of Tutuila, consisting of Ta’u, Olosega, and Ofu), Rose Island, and Swains Island (Figure 1). The largest island of Tutuila covers an area of 143 km<sup>2</sup>, accounting for 72% of the total land area (Central Intelligence Agency 2008), and approximately 97% of the territory’s population (2010 Census).



**Figure 2** Map of American Samoa

Note: Map image from [www.mapsof.net](http://www.mapsof.net)

American Samoa's climate is classified as tropical marine and is moderated by the southeast trade winds. The average temperature for the island territory is ~82°F with little seasonal deviation from this norm. The rainy season extends from November to April; the typhoon season is usually experienced from December through March.

American Samoans maintain a strong cultural heritage. Based on our household survey, 93% of the population was found to be of Samoan ethnicity (as compared to 91% - U.S. 2010 Census), and maintaining *fa'a Samoa* or "the Samoan way" was considered a priority under the territorial constitution. Samoan is the predominant language, although English is often spoken in school and business settings. The Samoan hierarchical social structure remains intact in most villages, with *matai* (family leaders) comprising the village administrative group or village council (*pulega fa'alenu'u*). According to the revised 1967 American Samoa Constitution (2011), the *pulega fa'alenu'u* structure is reproduced at the jurisdictional scale, and individuals are required to have the *matai* title in order to serve in the American Samoan territorial legislature (*fono*).

American Samoa receives significant economic support from the US government, which supplies the majority of the island territory's operating budget (BEA 2014).

# Methodology

## *2014 NCRMP Survey*

Resident surveys took place in American Samoa on the island of Tutuila in 2014, and will be repeated (approximately) every 7 years. The sample frame for this study was adults, eighteen years or older, who live on the island of Tutuila, American Samoa.

The American Samoa survey data collection was focused on the following indicators:

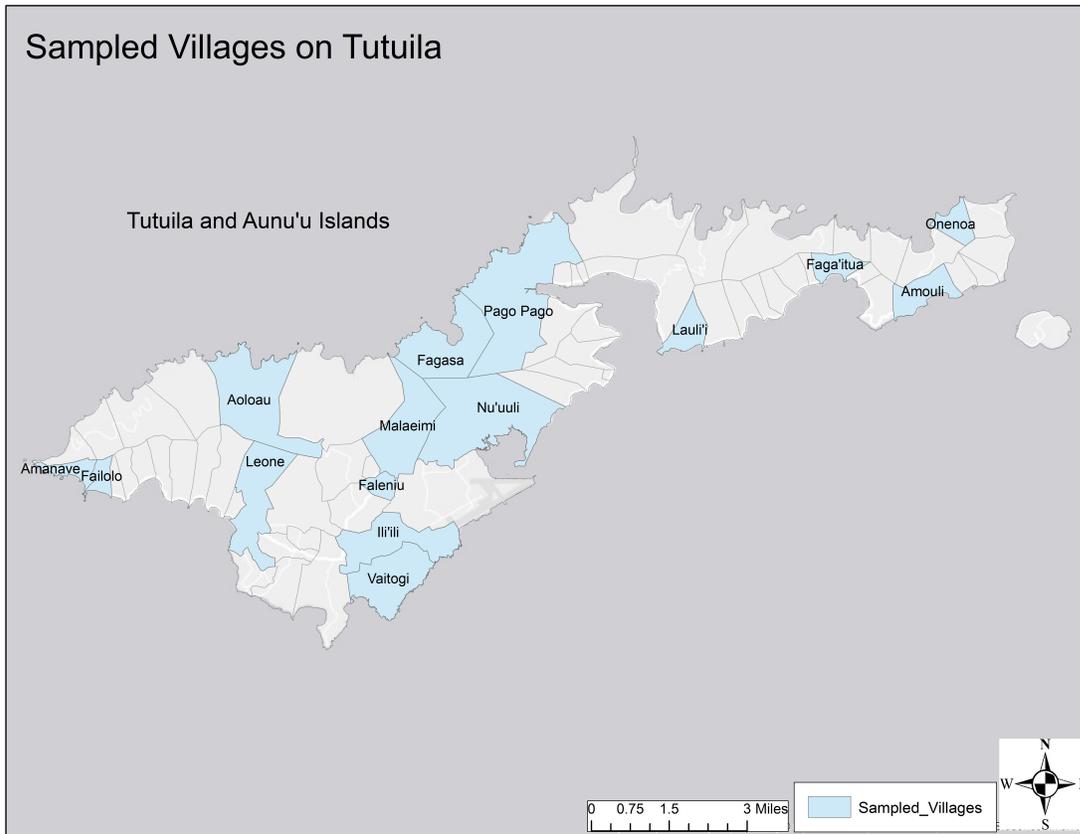
- Participation in reef activities (including snorkeling, diving, fishing, harvesting);
- Perceived resource condition;
- Attitudes toward coral reef management strategies and enforcement;
- Awareness and knowledge of coral reefs;
- Cultural importance of reefs; and
- Participation in behaviors that may improve coral reef health.

These variables will fulfill national level indicator development needs while providing locally relevant information (e.g., attitudes towards local management strategies). More information on the general survey methods applied can be found on the NCRMP socioeconomic CORIS site: [http://www.coris.noaa.gov/activities/projects/ncrmp\\_socio/documents/faqs\\_ncrmp\\_social\\_survey.pdf](http://www.coris.noaa.gov/activities/projects/ncrmp_socio/documents/faqs_ncrmp_social_survey.pdf). Details of the American Samoa survey effort are provided below.

Surveys were conducted on Tutuila Island during February 2014. To obtain a stratified sample of respondents, villages in American Samoa were categorized by degree of urbanization (urban, semi-urban, and rural) and location on Tutuila Island (east, west, northeast, or northwest). The census uses only East and West districts in their categorizations, but additional sub-divisions differentiating the northern villages were added to ensure representative inclusion of these remote (and potentially more reef-dependent) communities. Villages were randomly selected from each category, and the percent population of the sample villages in each category approximated the percent of the total island population in that category. Residents were sampled proportionate to the total population in each village. Sampled villages included: Amanave, Amouli, Aoloau, Faga'itua, Fagasa, Failolo, Faleniu, Ili'ili, Lauli'i, Leone, Malaeimi, Nu'uuli, Onenoa, Pago Pago, and Vaitogi (Figure 3). In total, 448 residents were surveyed, yielding a confidence level of 95% and a confidence interval of 4.6% for the island-wide results<sup>1</sup>.

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<sup>1</sup> Results are considered statistically significant at the island level, but not at the level of individual villages.



**Figure 3** Location of sampled villages on Tutuila

Prior to surveying, information regarding the monitoring effort was presented to the Office of Samoan Affairs as well as to mayors of the villages included in the target sample. A local survey team was trained in survey administration and protocol. Survey questions were carefully translated to capture the meaning of each question in the English version. A Samoan word can have several meanings, so multiple Samoan-speaking project team members reviewed and revised the translation to ensure consistency with the English version of the survey. This team conducted surveys in-person in each of the selected villages on weekday afternoons and early evenings, as well as on Saturdays. Residents were sampled opportunistically due to the difficulty of pre-selecting random households (e.g., no street addresses for homes, large numbers of unoccupied structures), and the challenges of using a random sampling approach in the field (e.g., vicious dogs). The survey team made an effort to survey different regions of each village and, to the extent possible, to target respondents from different demographic categories. Respondents were offered the choice to conduct the survey in either English or Samoan, based on their own language preference. Eighty-one percent of surveys were conducted in Samoan and 19% conducted in English. A copy of both the English and the Samoan version of the survey

instrument may be found in Appendix 2. No names or personally identifiable information were collected during the surveys.

This report presents a summary of select indicators collected via the survey instrument. A presentation on all survey data can be found at <http://www.coris.noaa.gov/monitoring/socioeconomic.html>.

## ***Secondary Data Collection***

Additional socioeconomic data was compiled for American Samoa from secondary data sources such as the US Census Bureau, Environmental Protection Agency, US Department of Health and Human Services, National Weather Service, and local government agencies. These data were collected and analyzed at the jurisdiction level, though smaller geographies may be included in future analyses. Secondary data collection includes cleaning and transforming data prior to analyses, maintaining documentation from original sources, evaluating data for errors, and other data proofing procedures.

The secondary data collection for American Samoa was focused on the following indicators:

- Human population change near coral reefs;
- Community well-being; and
- Physical infrastructure.

All secondary data presented in this report are taken from the NCRMP socioeconomic project collection as described above. Original sources for all data presented in the report can be found in the data sources table (Appendix 3). Data items that are cited were not included in the long term project collection because they are unique to the jurisdiction or are not available in a standardized format over time.

The following indicators will be developed through using a combination of survey (primary) and secondary data:

- Economic impact of coral reef fishing to jurisdiction;
- Economic impact of dive/snorkel tourism to jurisdiction;
- Awareness of coral reef rules and regulations;
- Governance; and
- Community well-being.

## ***Data Analysis***

Data analysis of both survey and secondary data includes descriptive analyses (e.g., measures of central tendency, examination of distribution), as well as examinations of relationships between variables (e.g., cross tabulations, correlation, regression analyses). Additionally, geospatial analyses are used to examine the extent of governance and specifically, the amount of coral reef

area under a protected status. Some of the key findings will be discussed in the following sections of this report.

## ***Findings***

The results below were obtained from either primary data collection, secondary sources, or a combination of the two, and are organized according to one or more of the thirteen socioeconomic indicators presented in Table 1.

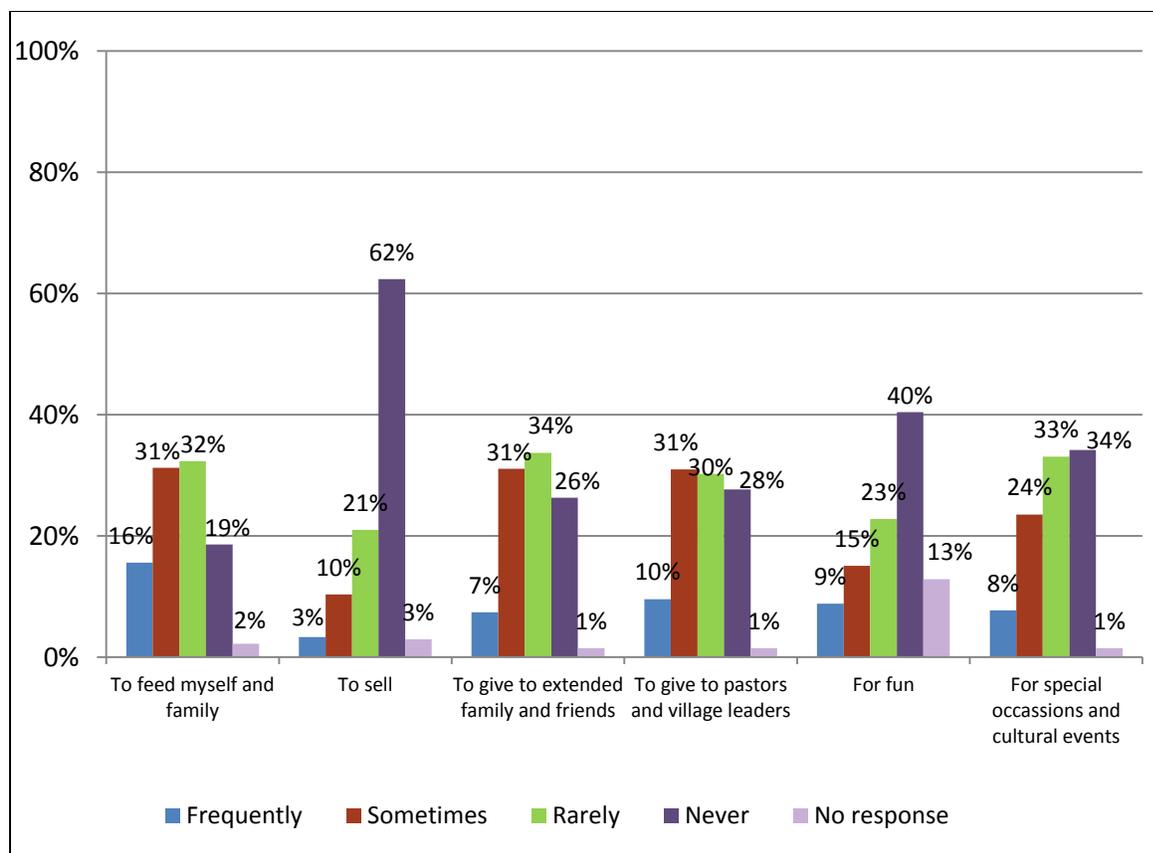
### **Participation in coral reef activities**

Participation in coral reef activities was prioritized as the top indicator of interest among the NCRMP priority socioeconomic indicators. This indicator is broadly divided into recreational non-extractive activities (e.g., swimming, beach activities etc.) and extractive activities (e.g. subsistence or commercial gathering and harvesting).

Participation in recreational reef activities is relatively uncommon in American Samoa, with the exception of beach swimming and beach recreation. Fishing and gathering of marine resources is more common, with just over half of respondents stating that they fish, and 15% fishing once a week or more. Table 3, below, outlines the percent rates for respondents' self-reported frequency of participation in coral reef related activities.

**Table 3 Frequency of participation in various extractive and non-extractive reef activities**

|                         | Non-extractive activities |            |                        |                          |                  |         |                          |         | Extractive Activities |                               |
|-------------------------|---------------------------|------------|------------------------|--------------------------|------------------|---------|--------------------------|---------|-----------------------|-------------------------------|
| Frequency               | Swimming                  | Snorkeling | Diving (SCUBA or free) | Waterside/ beach camping | Beach recreation | Boating | Outrigger canoe /Fautasi | Surfing | Fishing               | Gathering of marine resources |
| Never                   | 20%                       | 70%        | 93%                    | 55%                      | 39%              | 75%     | 82%                      | 86%     | 47%                   | 56%                           |
| Once a month or less    | 32%                       | 14%        | 3%                     | 29%                      | 29%              | 13%     | 7%                       | 5%      | 21%                   | 23%                           |
| 2-3 times a month       | 20%                       | 7%         | 2%                     | 10%                      | 16%              | 5%      | 3%                       | 2%      | 16%                   | 7%                            |
| 4 times a month or more | 23%                       | 5%         | 2%                     | 5%                       | 13%              | 5%      | 3%                       | 3%      | 15%                   | 6%                            |
| No response             | 4%                        | 3%         | 1%                     | 1%                       | 2%               | 3%      | 5%                       | 4%      | 1%                    | 7%                            |



**Figure 4** Frequency of fishing for various purposes in American Samoa

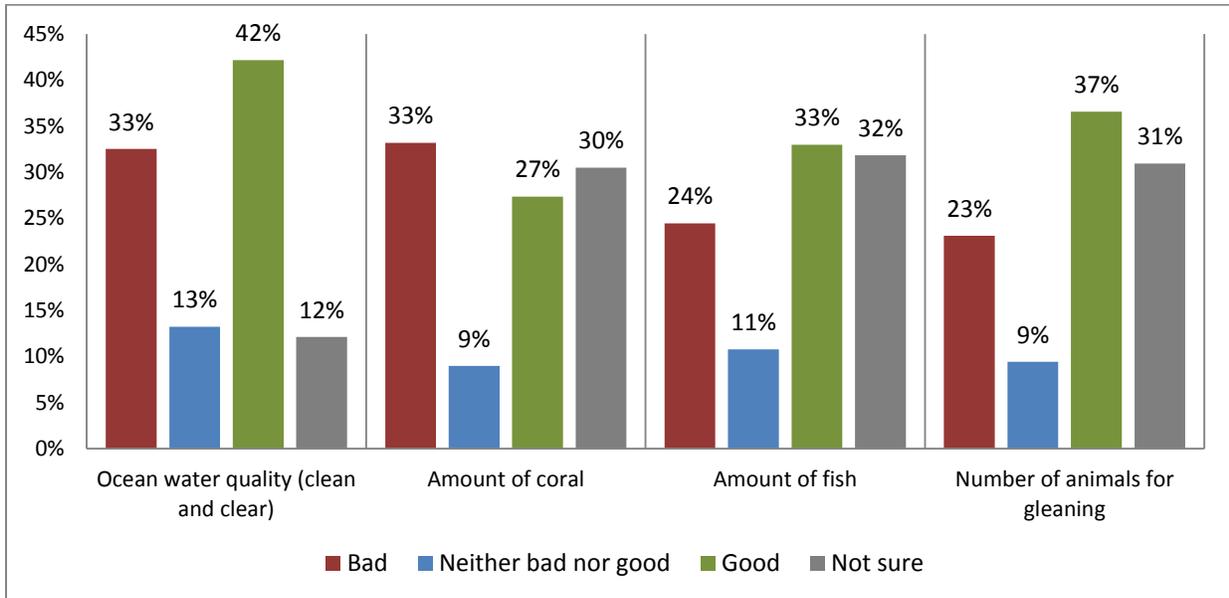
For those who fish in American Samoa, Figure 4 shows their stated reasons for fishing and frequency of fishing for those reasons. Commercial fishing is very uncommon in American Samoa; only 3% of those who fish stated that they frequently fished to sell their catch, and 62% of those who fish never sell their catch. More commonly, people fish to feed themselves and their family, or to give to extended friends, family, pastors, and village leaders.

### *Frequency of seafood consumption*

American Samoans consume seafood frequently, with 78% of respondents stating that they eat fish or seafood once a week or more. Most American Samoans purchase seafood from stores or restaurants, with 65% of survey respondents listing this as their first or second choice for obtaining seafood. Markets and roadside vendors (45%) and fish caught by household members (37%) are also a common means for obtaining fish.

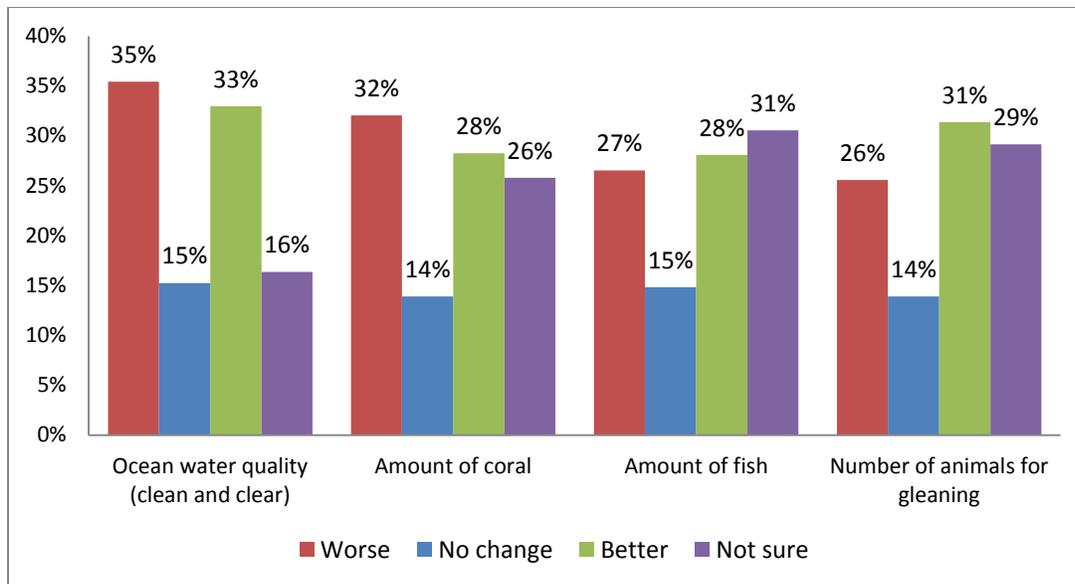
## Perceived resource condition

Figure 5 illustrates residents' perceptions of resource conditions in American Samoa. While ocean water quality is generally perceived to be good or very good (42%), there was low level of consensus regarding the amount of coral, fish, or of animals for gleaning (with approximately one third of residents stating that they were uncertain of the condition of these resources).



**Figure 5 Resident opinions regarding current conditions of marine resources**

Figure 6 shows residents' perceptions of how the conditions of marine resources have changed over the past 10 years. There is a fairly equal distribution between residents thinking conditions have worsened and improved for ocean water quality, amount of fish, amount of coral and number of animals for gleaning.



**Figure 6 Resident opinions on change in condition of marine resources over past 10 years**

When asked how the conditions of marine resources will change in the next 10 years, roughly equal numbers of respondents think conditions will get worse (31%) vs. improve (30%), while the remainder believe marine resource conditions will stay the same (21%) or are not sure (17%).

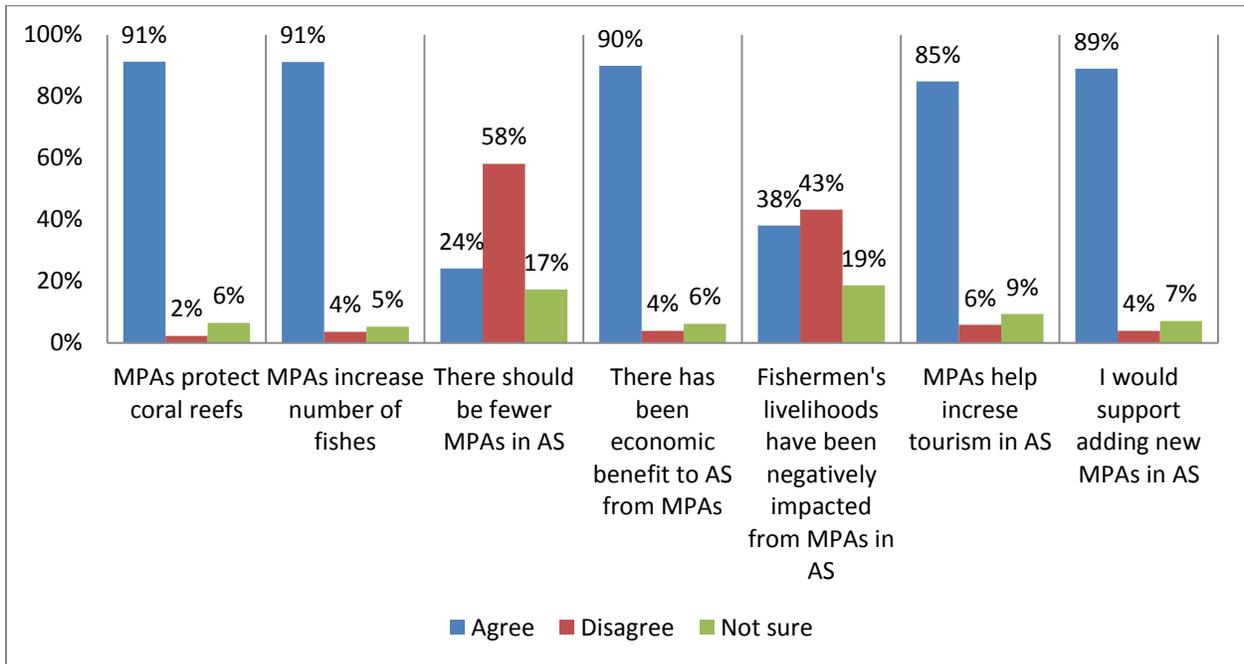
### **Participation in behaviors that improve coral reef health**

Despite some ambiguity surrounding the perception of marine resource conditions, as demonstrated by Figures 5 and 6, many respondents in American Samoa stated that they participate in behaviors that may improve coral health. These activities include, for example, beach or village clean ups and volunteering with an organization that is taking actions to protect the environment (such as church and youth groups). Forty-eight percent of respondents reported participating in these types of activities several times a year or more while 47% reported participating once a year or less.

### **Attitudes towards coral reef management strategies**

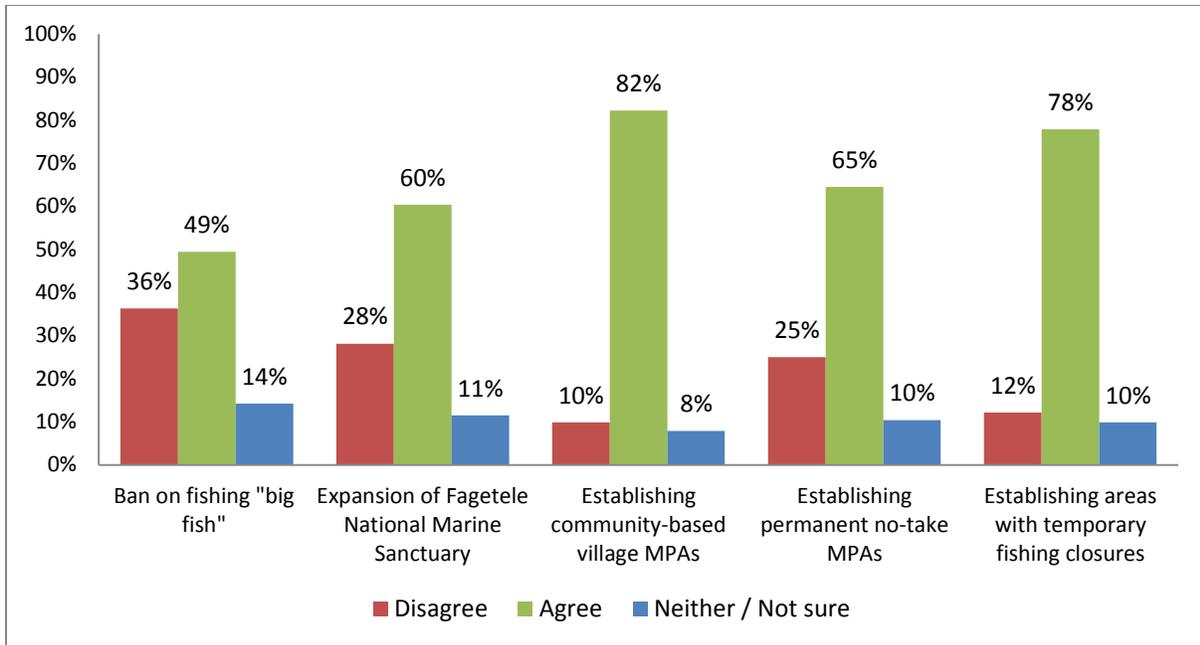
Residents were asked a number of questions regarding their awareness of and attitudes towards marine management policies. Figure 7 shows that over half (51%) of those surveyed stated that they were either familiar or very familiar with marine protected areas (MPAs). Overall, respondents agreed that MPAs provide benefits (Figure 7). Ninety percent or more of respondents agreed or strongly agreed that MPAs protect coral reefs, increase number of fishes, and that there has been economic benefit to American Samoa from MPAs. The vast majority of

respondents also supported adding new MPAs in American Samoa (89%) and that MPAs help increase tourism in American Samoa (85%). Only 24% of respondents stated that there should be fewer MPAs in American Samoa (with the majority of respondents disagreeing with this statement). There was less certainty regarding whether or not fishermen’s livelihoods have been negatively impacted by MPAs, with 42% disagreeing with this statement, and 38% agreeing.



**Figure 7 Resident opinions regarding marine protected areas in American Samoa**

Figure 8 below illustrates residents’ support for management policies in place (or proposed) in American Samoa. Residents were generally supportive of current marine management policies. There was extremely high support for community-based village MPAs (82%) and temporary fishing closures (78%). The village of Fagamalo, for example, has established two marine protected sites, a MPA with temporary take and a No-take MPA as part of the Community-based Fisheries Management (designation sign shown in the photo). The ban on fishing “big fish” species (e.g., humphead wrasse, bumphead parrotfish, and giant grouper) was the only management measure not supported by a majority of residents (with 49% agreeing with this policy).



**Figure 8** Resident opinions regarding management policies in American Samoa



**Community-based fisheries management area of Fagamalo village (A. Levine)**

## Awareness and Knowledge of coral reefs

When asked about important services provided by reef resources, most survey respondents agreed that coral reefs protect American Samoa from erosion and natural disasters (75%), that coral reefs attract tourists (75%), and that coral reefs are important to American Samoan culture (89%). The majority of respondents disagreed with the statement that coral reefs are only important to fishermen, divers, and snorkelers (54%).

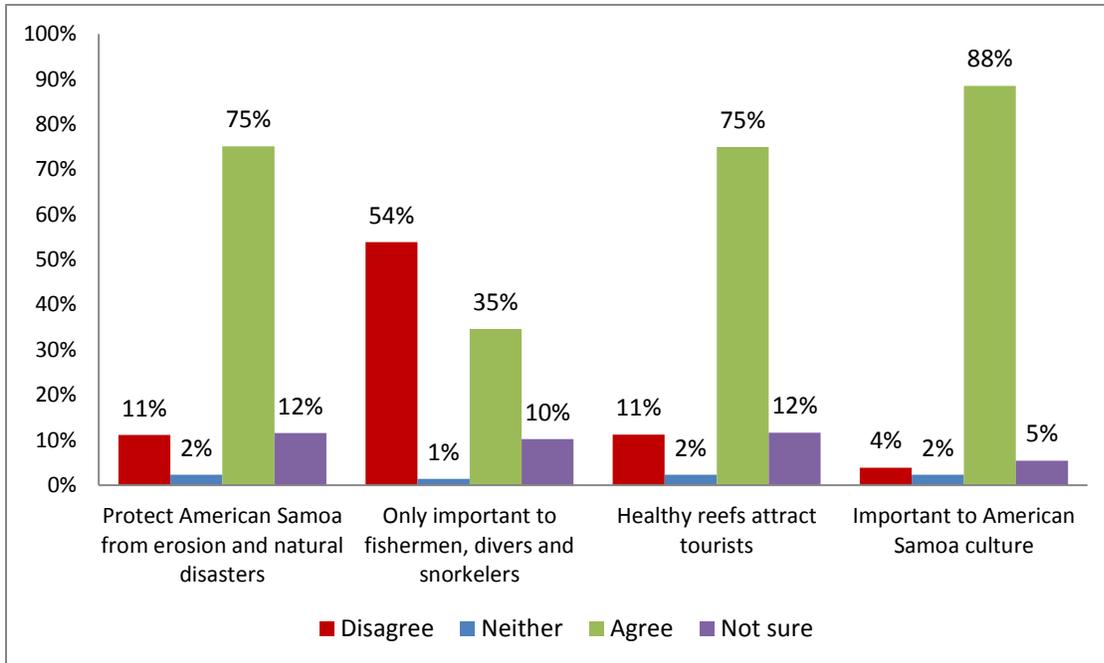
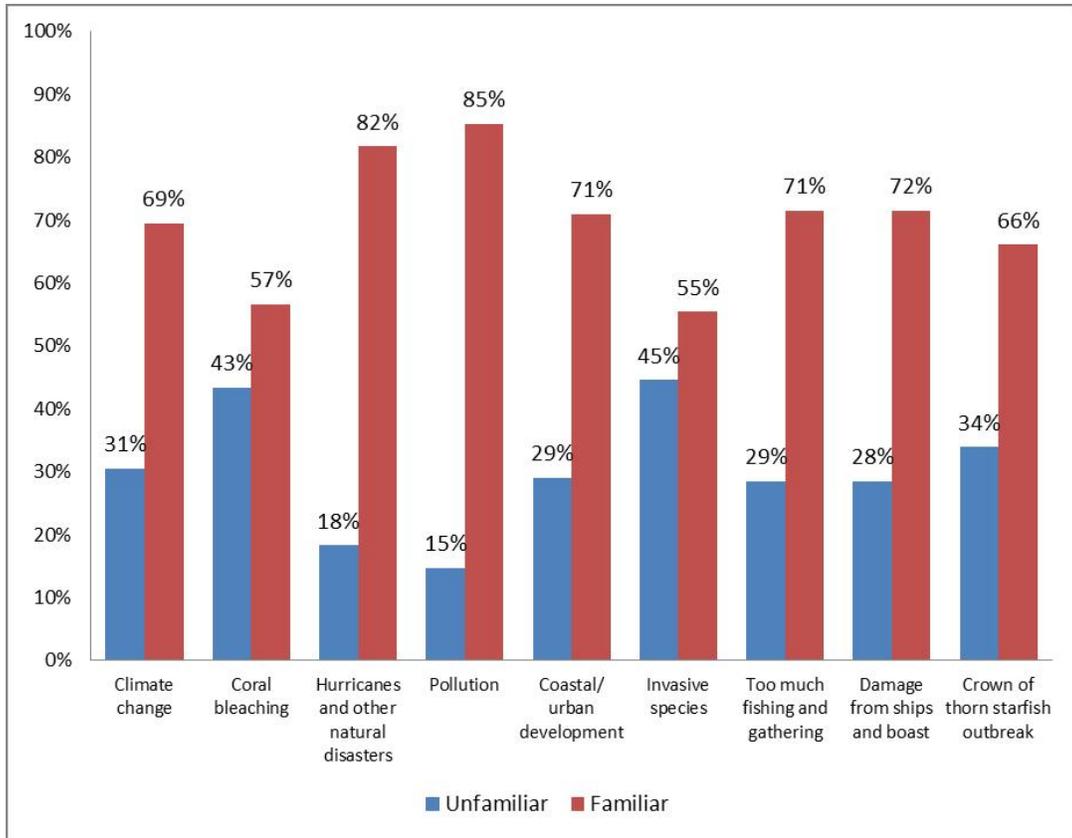


Figure 9 Resident perceptions regarding coral reef services

### *Familiarity with threats*

In general, residents were familiar with potential threats facing coral reefs in American Samoa, with well over half of respondents stating they were familiar or very familiar with each potential threat listed in Figure 10.

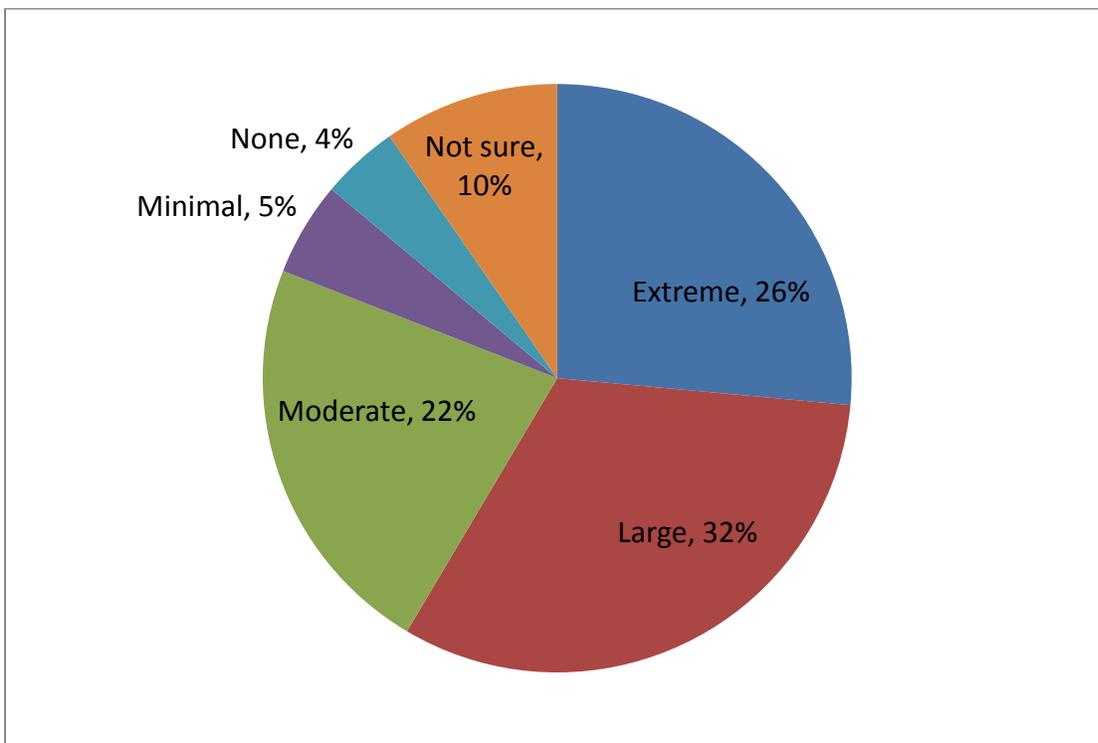
Of these potential threats, respondents were least familiar with climate change, coral bleaching, invasive species and crown of thorn starfish outbreaks. They stated that they were extremely familiar with threats from pollution and hurricanes or other natural disasters.



**Figure 10 Residents' familiarity with threats to coral reefs**

### *Level of threats to coral reefs*

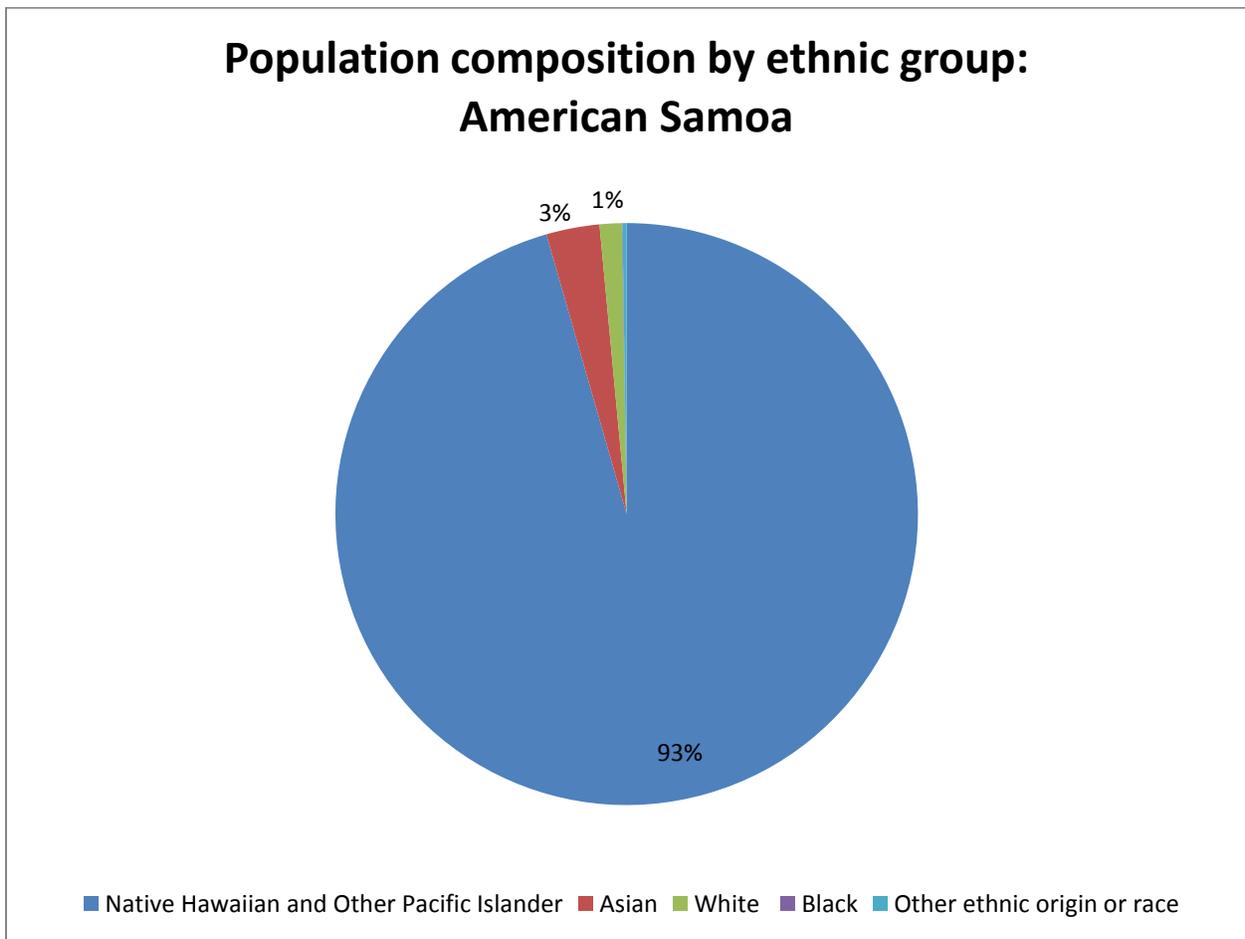
Residents were generally concerned about threats to coral reefs in American Samoa (Figure 11). Twenty-six percent of survey respondents stated that they thought threats are extreme and 32% thought threats are large. A small percentage (5%) stated that threats are minimal and an even smaller percentage (4%) did not perceive that there are any threats. This is perhaps surprising given the mixed perceptions regarding changes in coral reef resources over the past 10 years (Figure 6) and the fact that only 31% of respondents stated that they believe that the condition of coral reef resources will get worse in the next 10 years. This may indicate confidence that many of these threats are being sufficiently addressed.



**Figure 11** Residents' perceptions of the severity of threats to coral reefs

## Human population composition and trends (change) near coral reefs

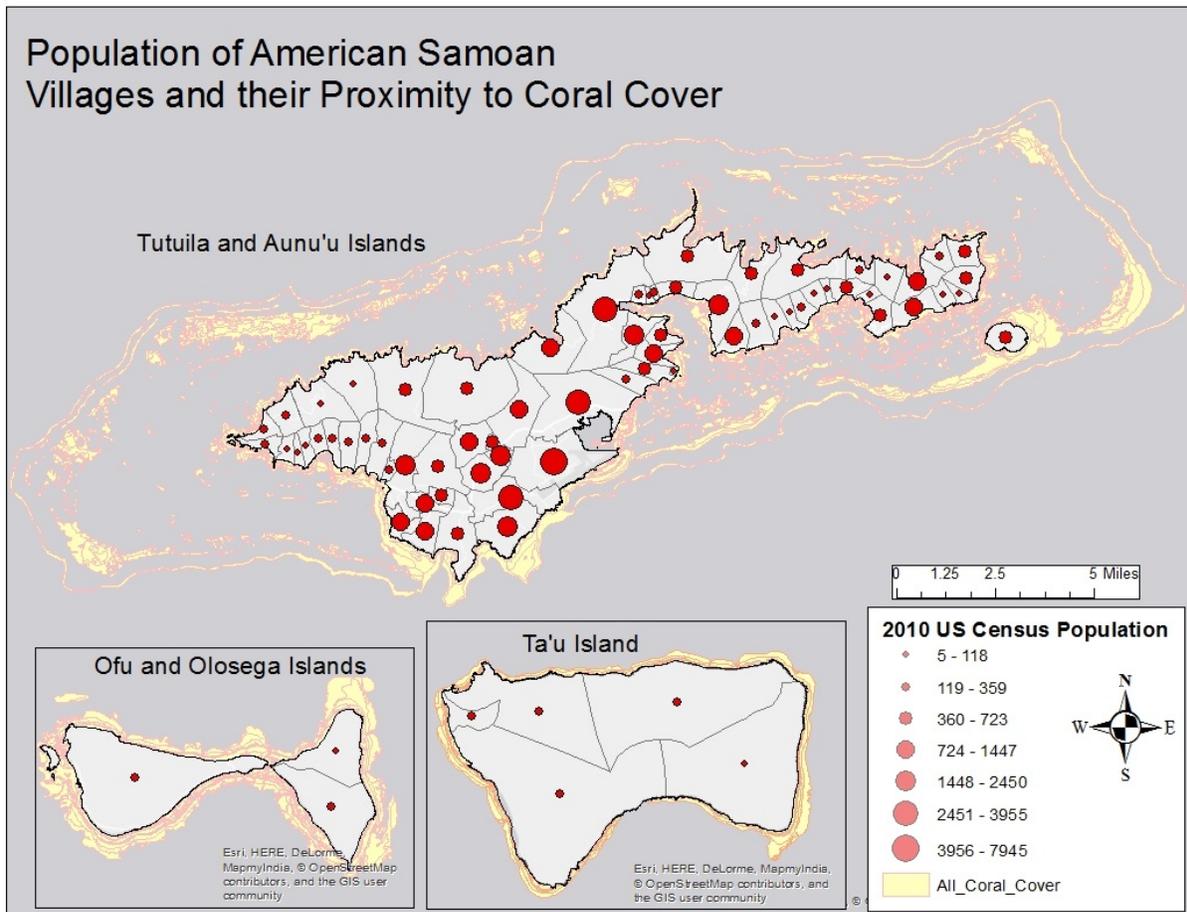
Based on our findings, American Samoa's population is predominantly composed of Pacific Islander ethnicity, with the majority identifying as Native Samoan or part Samoan (93%). The next largest ethnic category is Asian (3%). Figure 12 below describes the population composition by ethnicity.



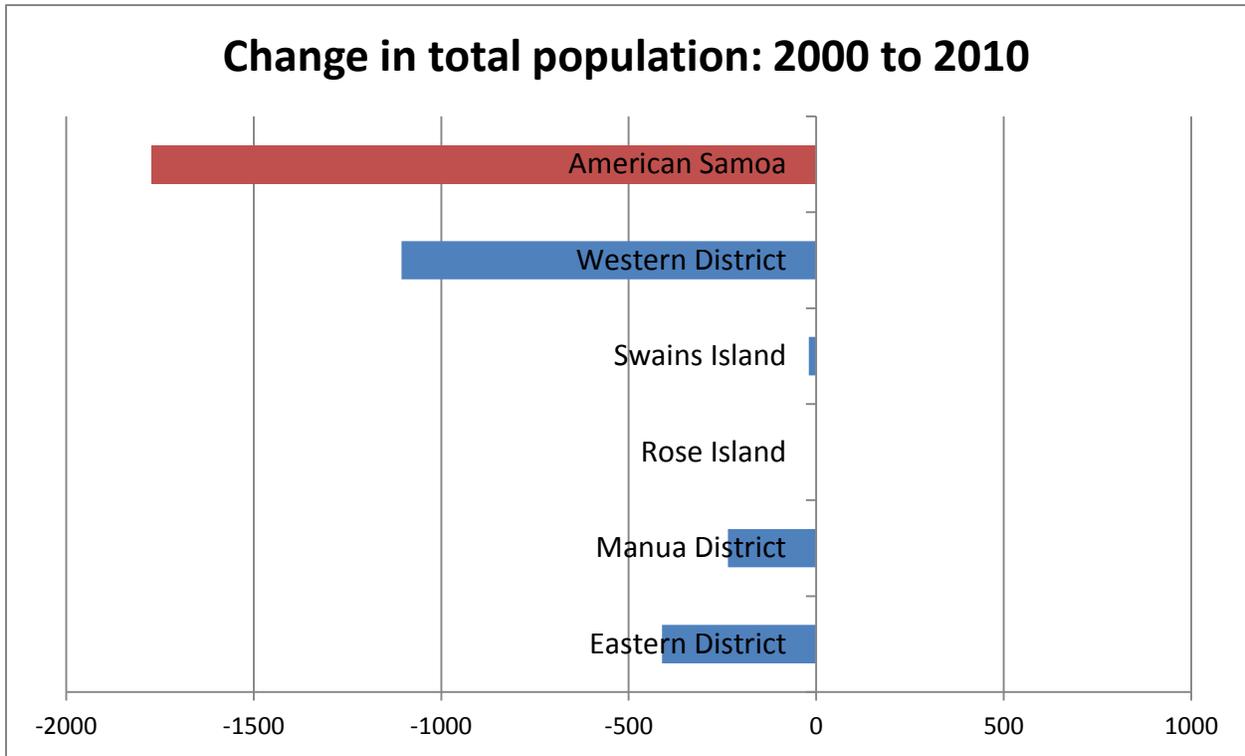
**Figure 12** Population composition grouped by ethnicity

American Samoa's largely homogenous ethnic make-up facilitates certain approaches in natural resource management, such as the incorporation of traditional systems into village-based MPAs (Levine and Richmond 2014), and has implications for education and outreach strategies in the territory.

The majority of the population of American Samoa lives on the southern side of Tutuila, with the Manu'a Islands and Swains Island having a significantly lower population density (Figure 13). There was an overall decrease in population for American Samoa and all districts from 2000 to 2010 (Figure 14). This pattern is consistent with several other US coral jurisdictions including Commonwealth of the Northern Marianas, US Virgin Islands, and Puerto Rico. The decreased population is most evident on the island of Tutuila, which is comprised of the Eastern and Western Districts, and is due in large part to the 2009 closure of one of the island's two tuna canneries, a major source of employment on the island. Tri-Marine opened a new cannery in Tutuila in 2015 (Sagapolutele 2015), which may result in a reversal in this declining population trend.



**Figure 13** Population and proximity to coral cover in American Samoa



**Figure 14** Change in population from 2000 to 2010 (\*Rose Island is uninhabited)

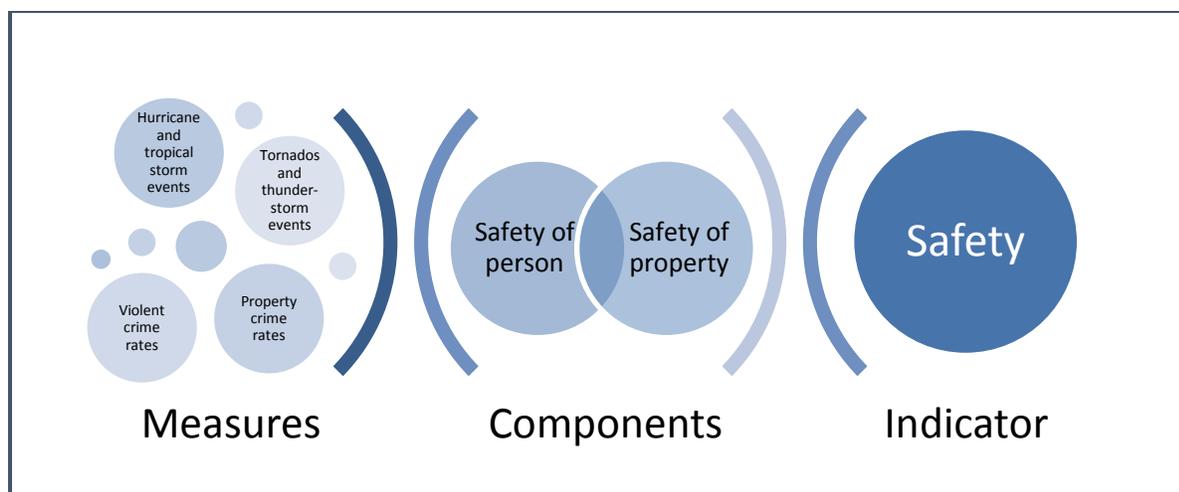
More than 40% of the population in American Samoa is 18 years of age or younger. The senior population is quite small with only about 4% of the population 65 years of age or older.



**Two generations of American Samoans, old and new (A. Levine)**

### **Community well-being**

Eight composite indicators of well-being are being developed for the socioeconomic component of the NCRMP. These include: access to social services, basic needs, education, health, governance, economic security, safety, and social connectedness. These composite indicators will be reported at the end of the first monitoring cycle and are composed of multiple measures (see for example, the components and measures of the composite indicator “safety” in Figure 15). A selection of measures that will be used to operationalize the well-being indicators for American Samoa (Figure 15) are presented and discussed below.



**Figure 15** Safety presented as an example of a composite indicator

## Health

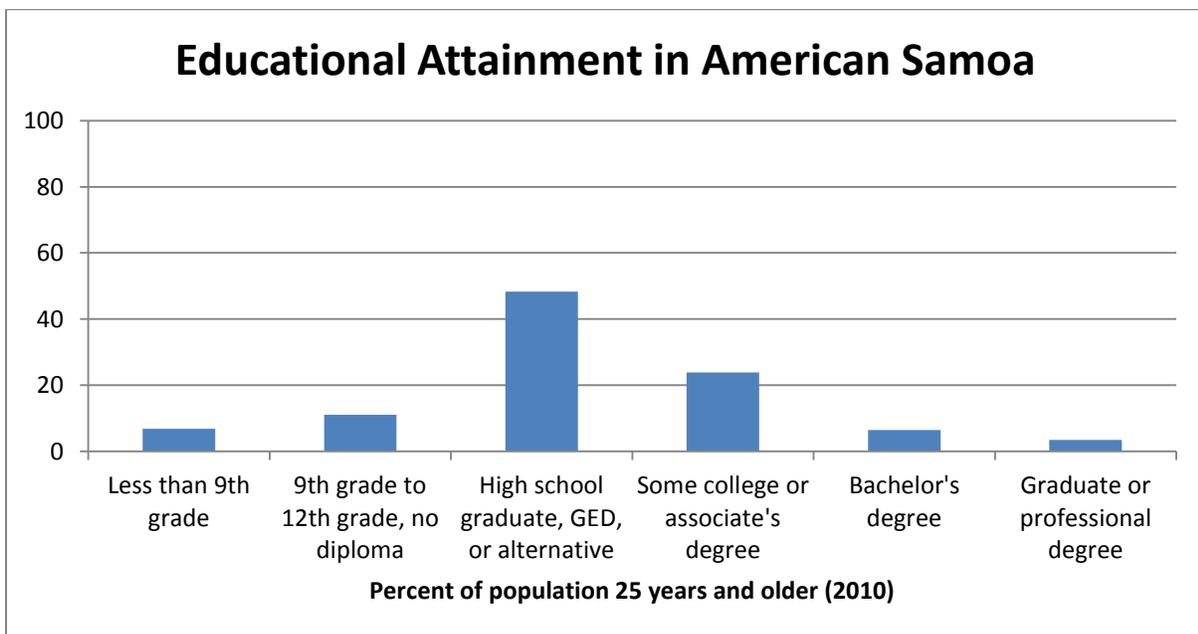
Health, both physical and mental, contributes tremendously to individual and population well-being. Measures of life expectancy, mortality, and opportunity for a healthful lifestyle can be used to assess a population’s health. Some of the measures that will be used as part of the indicator for health across all jurisdictions include leading cause of death, life expectancy, and three categories of age adjusted death rates (from all cancers, from heart disease, and overall). The leading cause of death in American Samoa (2006-08) was cancer and malignant neoplasms. The average life expectancy (2012) was 74.7 years of age. In 2010, the age adjusted death rate from all cancers was 152.5 per 100,000 people, the age adjusted death rate from heart disease was 168.9 per 100,000 people, and the overall age adjusted death rate was 1090.0 per 100,000 people. While these measures of health are being tracked across all jurisdictions, there are additional health issues of significance in American Samoa. For example, American Samoa has one of the highest rates of diabetes in the world with approximately 48% of the population affected in 2004 (WHO 2004), as well as the highest rate of obesity across all Pacific Islands (Hawley and McGarvey 2015).

## Basic Needs, Access to Social Services, and Education

Basic needs, access to social services, and education are important social dimensions of well-being. The measures for basic needs include those related to the adequacy of housing, access to healthy food, transportation, basic infrastructure, and clean water. Additional measures that are related to basic needs are included below, under physical infrastructure. The median value of owner occupied housing units in American Samoa is just over \$68,000. Land is passed down through families in American Samoa, and a person must be able to claim at least 50% Samoan ethnicity to own land (with the exception of freehold land).

Approximately 60% of all Samoan households have access to a vehicle. Only 4.2% of occupied households lack access to telephone service. Approximately 34.6% of occupied households have access to a computer or laptop at home; of those, 22% have access to internet service. Of the 10,963 housing units in American Samoa, 9,688 are occupied; 7,106 are owner-occupied and 2,582 are renter-occupied.

One of the key components of community well-being is education. K-12 enrollment, along with high school and college educational attainment will be combined to examine education. Approximately 18% of American Samoans 25 years or older did not complete high school or its equivalent in 2010 (Figure 16).



**Figure 16** Levels of educational attainment in American Samoa 2010

### *Economic Security*

The measures used to determine an indicator for economic security will include: gross domestic product, median household income, percent population in poverty, employment rate, and households receiving public assistance. One of the most telling measures of economic well-being at the territorial level is real gross domestic product (GDP). Since 2007, the overall trend in real GDP in American Samoa is downward (Figure 17). Although American Samoa recovered slightly in the immediate aftermath of the Great Recession, the real GDP has continued to decline to a figure of \$490 million (inflation adjusted to 2005 dollars) in 2013. In 2010, 4.8% of American Samoans age 16 years and older were unemployed. About 2% of those in this age

range participated in only subsistence activities. Only a small proportion of this group is employed in commercial fishing or tourism.

Future economic conditions in American Samoa remain uncertain. According to Grace-McCaskey (2015), production in the territory’s tuna processing facilities has declined in the recent past and tourism to the jurisdiction has decreased. While the United States Government increased its federal aid, boosting short-term employment in the jurisdiction, the long-term viability of those jobs remains unclear (Grace-McCaskey 2015). However, the recent opening of a new tuna processing facility could provide additional economic opportunities to the territory in the near future.

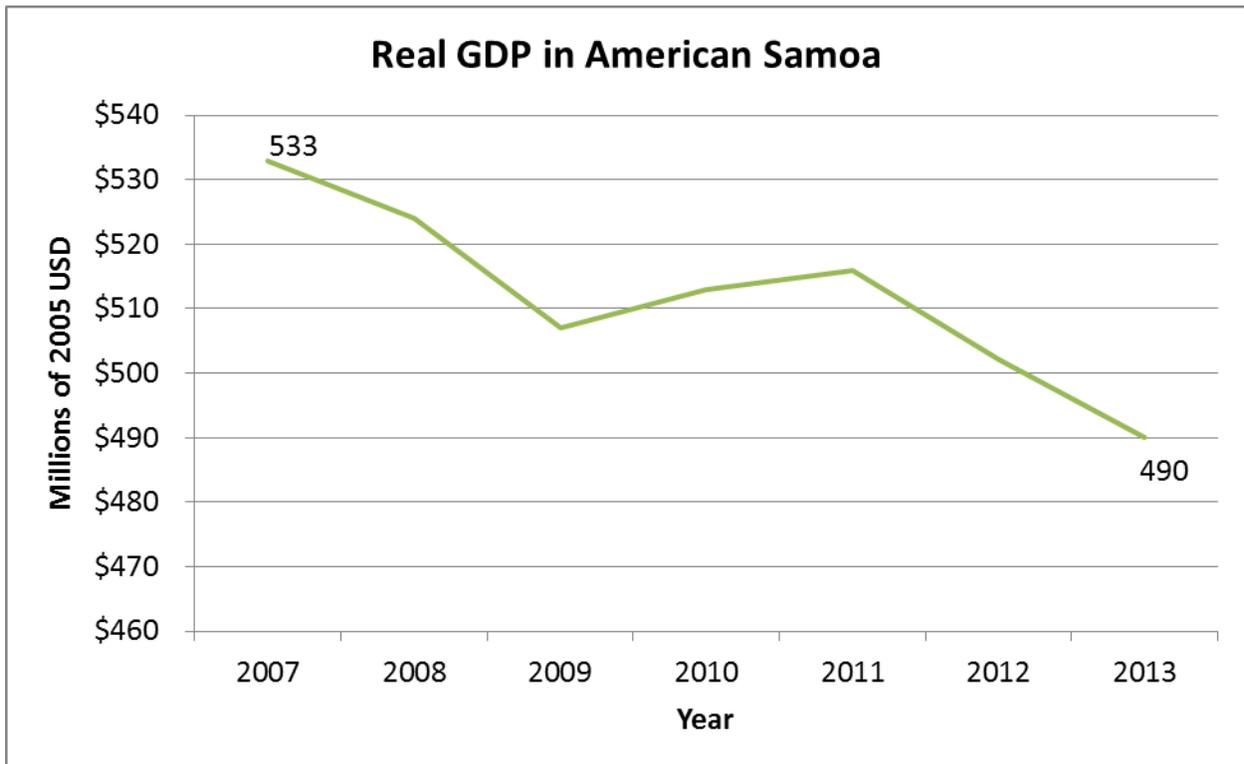
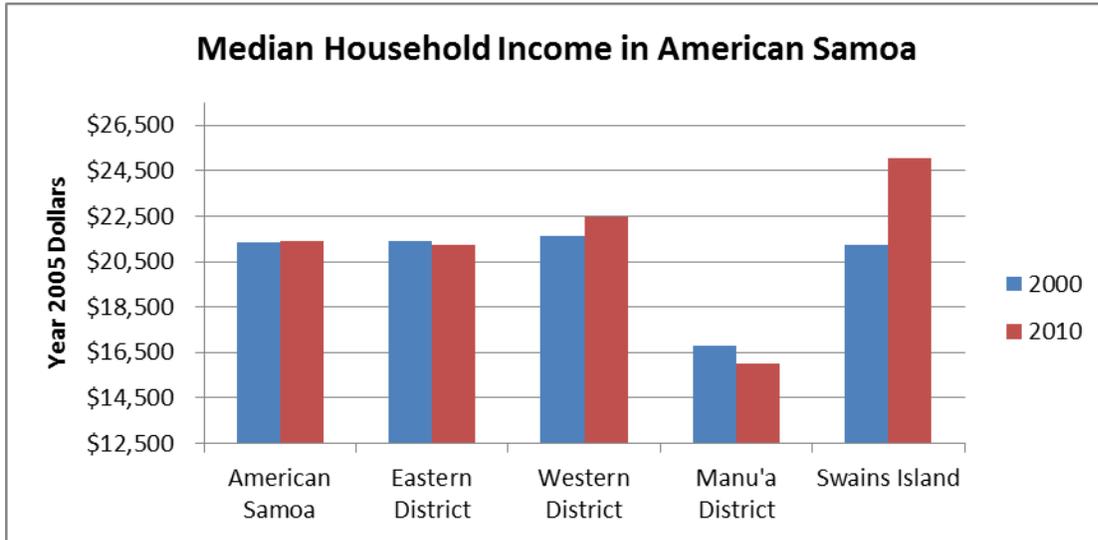


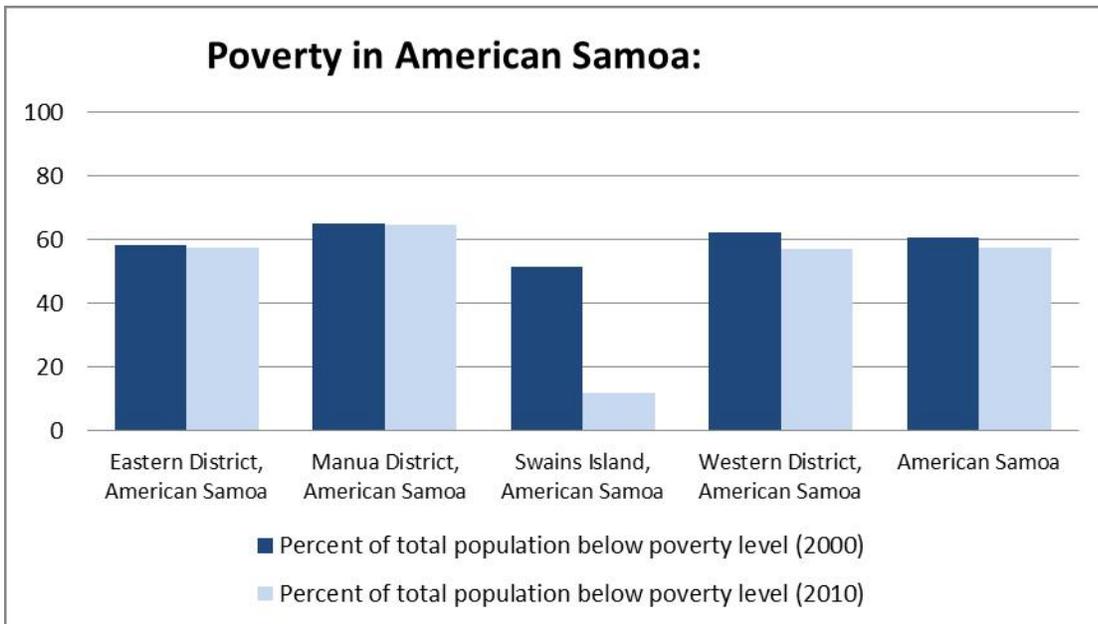
Figure 17 Real GDP in American Samoa

Real median household income stayed relatively constant from 2000 to 2010 in American Samoa as a whole with a slight increase observed in the Western District and slight decreases observed in the Eastern District and in the Manu’a District. On Swains Island, a relatively large increase (17.8%) in real median household income occurred from 2000 to 2010 (Figure 18); however, it should be noted that the total population of Swains Island in 2010 was only 17 people, largely agricultural workers, so this trend does not represent a significant change in the context of the total population of American Samoa. Over half of American Samoan residents have incomes

below the poverty line, although there was a 3.35% decrease in the percent of the total population below the poverty level between 2000 and 2010 (Figure 19).

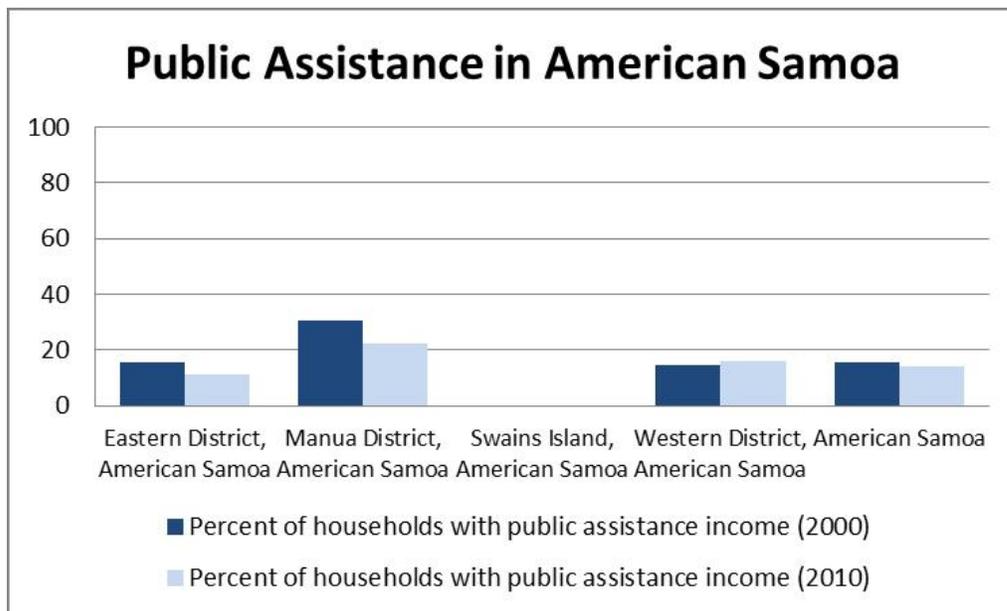


**Figure 18** Median Income in American Samoa in inflation adjusted 2005 US Dollars



**Figure 19** Level of poverty in American Samoa

The percent of the population receiving public assistance income did not experience a dramatic change from 2000 to 2010. The largest decreases in public assistance income receipt were in Manu’a District (8.10%) and Eastern District (4.41%). Interestingly, these districts had the least improvement in their poverty rates for the same period (Figure 20). The complete well-being assessment will examine the percentage of the population in need that is not being served by public assistance in order to measure the efficacy of support services in reaching target populations. Such measures are important to understanding the overall vulnerability of the population independent of stressors such as resource decline, severe storm events, and climate change.



**Figure 20** Level of public assistance in American Samoa

## Physical Infrastructure

Indicators for physical infrastructure relate to both the human development footprint, as well as measures in place to mitigate human impacts to the marine environment (e.g., point and non-point sources of land-based pollution, as well as sewage treatment and abatement).

### *Landcover and coastal access*

Impervious cover is a good indicator of development and is also associated with land-based pollution that can damage coral reefs. All islands combined, American Samoa has a total of 9.17 square kilometers of impervious cover, or approximately 4% of the territory’s land surface area (Central Intelligence Agency, 2015; Table 4).

The majority of shoreline types in American Samoa are either rocky (45%) or beach (41%). While a paved road runs along the majority of Tutuila’s south coast, the North maintains many areas that are inaccessible from shore. Villages are located in nearly all accessible coastal bays in Tutuila, but steep topography limits the extent of development across much of the islands. Several miles of the coastline have undergone some coastal engineering, such as rip rap, revetments, and sea walls, to prevent coastal erosion.

**Table 4 Impervious surface areas by island**

| <b>Island</b>                        | <b>Impervious Cover (Sq. km)</b> | <b>Percent of Total (%)</b> |
|--------------------------------------|----------------------------------|-----------------------------|
| <b>Tutuila</b>                       | 7.39                             | 5.19%                       |
| <b>East Manu’a (Tau)</b>             | 0.29                             | 0.66%                       |
| <b>West Manu’a (Ofu and Olosega)</b> | 0.07                             | 0.96%                       |
| <b>Swains Island</b>                 | 0.0009                           | 0.06%                       |
| <b>Total</b>                         | <b>7.75</b>                      | <b>3.97%</b>                |

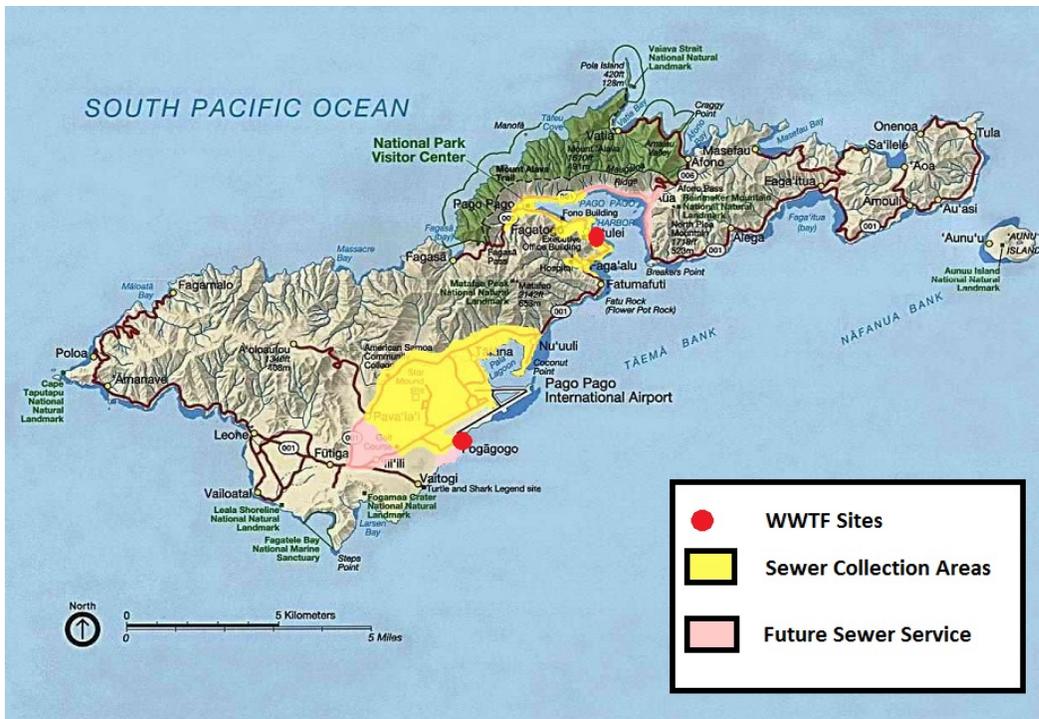
***Waste management and water supply***

Of the 9,688 occupied housing units, 4,440 (46%) have public sewer systems, while the remainder use septic tanks, cesspools or some other means of sewage treatment; 7,083 (73%) have complete plumbing facilities, while plumbing facilities in the remaining households are incomplete.

There are 26 public or village water systems in American Samoa (USEPA-OEI, 2015). These facilities bring water to approximately 9,532 housing units. Public water, however, has been on a “boil before drinking” alert for many years, so treatment is not considered adequate.

There are 4 Municipal Land Fill (MLF) facilities in American Samoa: Ofu (Ofu Island), Olosega (Olosega), Ta’u (Ta’u Island), and Futiga (Tutuila Island; USEPA-OEI, 2015). The Futiga MLF, located uphill from the Fagatele unit of the National Marine Sanctuary of American Samoa, is expected to reach critical capacity by 2015 (Samoa News, 2013).

Two wastewater treatment facilities (WWTF) exist in American Samoa, both located on Tutuila: the Fogagogo-Tafuna WWTF which serves the southwestern Tutuila Island Sewer Collection System, and the Utulei WWTF which serves the Pago Pago Harbor Sewer Collection System. Both systems discharge through outfalls to the ocean (USEPA, 2011). Figure 21 indicates regions where sewer collection is in place or planned for the future. Even within the areas indicated, however, sections of some villages still rely on remaining septic tanks or cesspools to deal with wastewater. One hundred percent of all beaches in American Samoa were monitored in 2011 for traces of waste. Of these, 92% were impacted by a beach advisory action; however, less than a third of beach days were impacted.



**Figure 21 Wastewater treatment facilities in American Samoa**

Note: Map image from US Environmental Protection Agency (USEPA 2011).

### *Physical access to coastal resources*

Access to the coast is regulated by individual villages. Outsiders must obtain permission from a village resident if they wish to access village coasts and bays. These tenure systems are stronger in rural villages, whereas many urban villages are now effectively open access. In addition to these informal community access points, there are also approximately 5 primary ports or boat ramps located at Pago Pago, Vatia, and Leone, as well as Aunu’u, where a ferry service is located. Future information (secondary data) collection should include updated information on ports, harbors and other formal points of access to coastal and marine resources.

## **Economic activities related to reefs**

### *Fishing*

In 2013 there were 25 American Samoa-based fishing boats with 75 fishermen that landed approximately 102,735 lbs. of fish. The three main methods of fishing in 2013 were bottom fishing, longlining, and spearfishing, respectively (America Samoa Government, 2014). It should be noted that this catch is typically dominated by pelagic species and not necessarily linked to the demersal reef fish species. For more details on general fish catch and statistics, readers can

refer to other sources such as those produced by the Western Pacific Fisheries Management Council ([http://www.pifsc.noaa.gov/wpacfin/central\\_pubs.php](http://www.pifsc.noaa.gov/wpacfin/central_pubs.php)) or the Pacific Islands Fisheries Science Center (<http://www.pifsc.noaa.gov/>).

### **Tourism**

Visitor arrivals to American Samoa have declined from a high of 33,710 in 2008 to a low of 26,247 in 2013. Over 40% of visitors came to American Samoa to visit relatives. Between 2005 and 2013, the month of July experienced the most off-island visits (American Samoa Government, 2014).

Many international visitors arrived via cruise ships, most frequently between the months of December and March. Cruise ships generally stayed for only one day; commercial stands are set up at the port during these visits and passengers may tour the island via *aiga* buses.



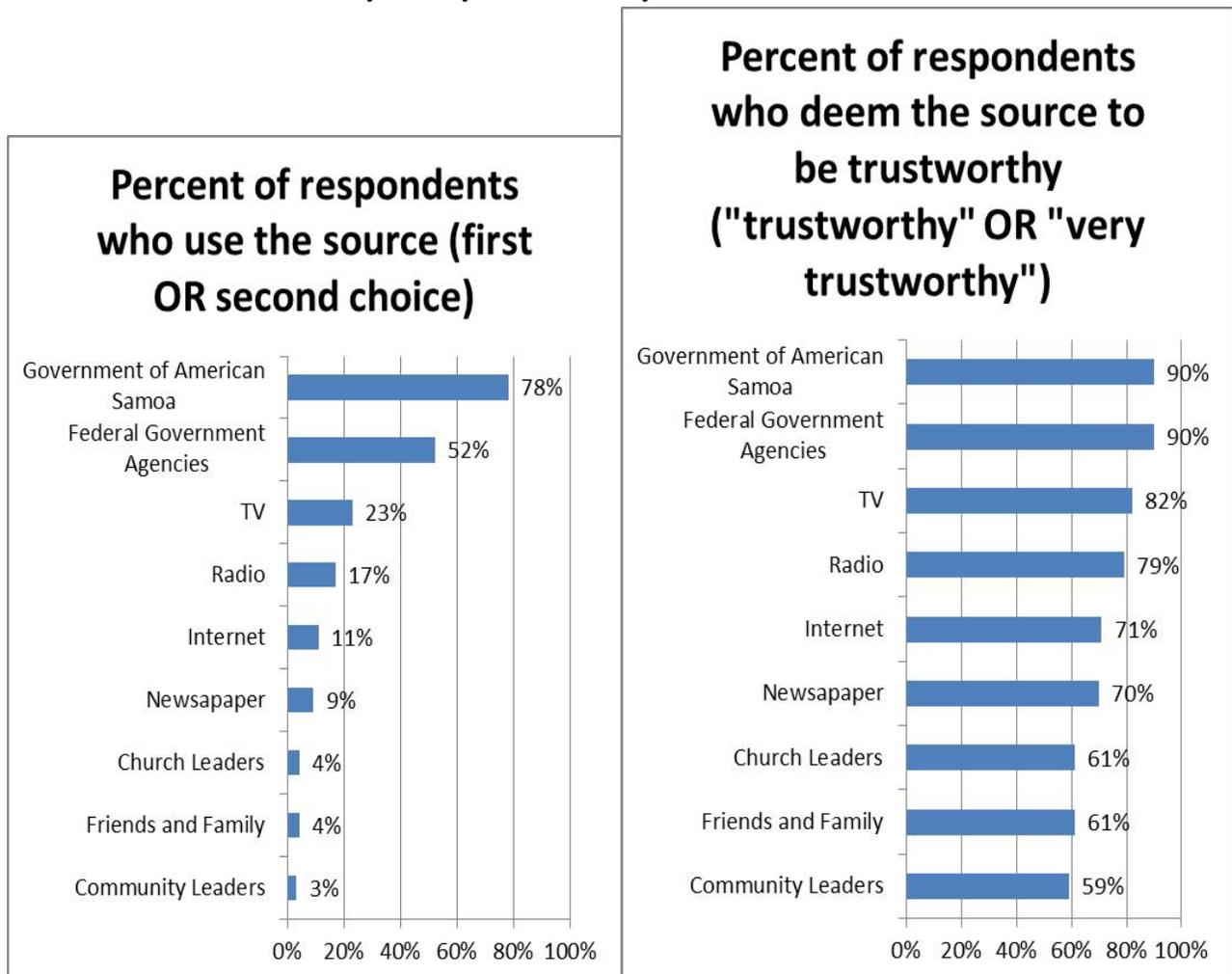
**A cruise ship docks in Pago Pago harbor (A. Levine)**

## Governance

Governance measures such as public trust, percent areas of coral reefs under management or protection, level of community involvement in decision making/local reef governance, and the presence, longevity, and focus of MPAs and other marine managed areas are used to assess governance related to coral reefs and the marine environment for each jurisdiction.

### *Sources of environmental information and level of trust*

The top two sources of information about coral reefs and the environment, according to survey respondents, are the government of American Samoa and U.S. federal government agencies (Figure 22). These are also the most trusted sources of information, with 90% of respondents considering each trustworthy or very trustworthy. Newspapers and community leaders were considered to be the least trustworthy, with 16% and 12% of respondents, respectively, stating that these were untrustworthy or very untrustworthy.



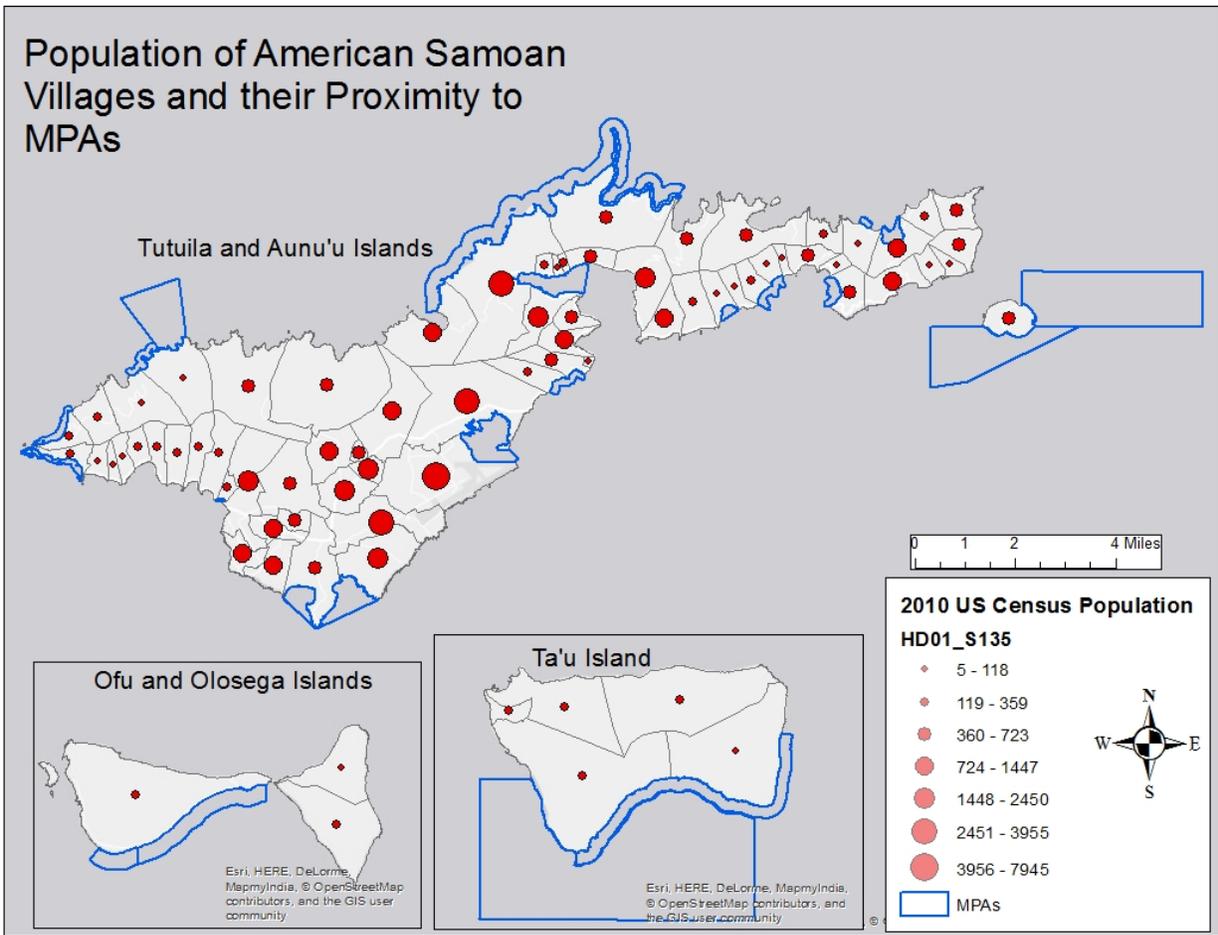
**Figure 22** Top sources of information and level of public trust

### *Involvement in coral reef management decision making*

Survey respondents stated that communities in American Samoa were involved in protecting and managing coral reefs, with 41% stating that communities were very involved or moderately involved, and 27% stating that communities were slightly involved. At the individual level, involvement in making decisions regarding the management of marine resources in American Samoa was similar, with 40% stating that they were very involved or moderately involved, and 22% stating that they were slightly involved.

### *Other governance indicators*

Based on the MPA Inventory (2014), 70% of all marine managed areas (MMAs) in American Samoa have management plans in place (Table 5). The oldest inventoried MMA is just over 40 years old while some were established as recently as 2013 (establishment dates range from 1973 to 2013). Of the inventoried MMAs, cultural heritage is the primary conservation focus of twelve, and natural heritage is the primary focus of eight. Investigation shows that 24.7% of the mapped coral reef ecosystems in and around American Samoa are under some form of management regime. In 2010, the governor of American Samoa established a goal of 20% of American Samoa's coral reef areas to become no-take MPAs. To date, only 7% of coral areas are within no-take MPAs; however, communities in American Samoa have become actively involved in coral reef management, and 20% of coastal communities have some form of management plan in place. Management plans range from MPAs and village climate resiliency plans to wetland and watershed management plans.



**Figure 23 Proximity of populated areas to MPAs in American Samoa**

**Table 5 Details of the Marine Protected Areas of American Samoa**

| <b>Site Name</b>   | <b>Government Level</b> | <b>Management Plan</b>                       | <b>Area (sq. km)</b> |
|--|-------------------------|--|----------------------|
| <b>Alega Village Marine Protected Area</b>                     | Territorial             | Community Agreement                          | 0.15                 |
| <b>Alofau Village Marine Protected Area</b>                    | Territorial             | Community Agreement                          | 0.32                 |
| <b>Amanave Village Marine Protected Area</b>                   | Territorial             | Community Agreement                          | 0.34                 |
| <b>Amaua &amp; Auto Village Marine Protected Area</b>          | Territorial             | Community Agreement                          | 0.37                 |
| <b>Aoa Village Marine Protected Area</b>                       | Territorial             | Community Agreement                          | 0.34                 |
| <b>Aua Village Marine Protected Area</b>                       | Territorial             | Community Agreement                          | 0.34                 |
| <b>Fagamalo No-take MPA</b>                                    | Territorial             | No Management Plan                           | 2.89                 |
| <b>Fagamalo Village Marine Protected Area</b>                  | Territorial             | Community Agreement                          | 0.45                 |
| <b>Fagasa No-take MPA</b>                                      | Territorial             | No Management Plan                           | *                    |
| <b>Leone Pala Special Management Area</b>                      | Territorial             | No Management Plan                           | 0.09                 |
| <b>Masausi Village Marine Protected Area</b>                   | Territorial             | Community Agreement                          | 0.20                 |
| <b>Matu'u &amp; Faganeanea Village Marine Protected Area</b>   | Territorial             | Community Agreement                          | 0.32                 |
| <b>National Marine Sanctuary of American Samoa (all units)</b> | Federal                 | Site-Specific Management Plan                | 35175.23             |
| <b>National Park of American Samoa (marine area only)</b>      | Federal                 | Site-Specific Management Plan                | 11.81                |
| <b>Nu'uuli Pala Special Management Area</b>                    | Territorial             | No Management Plan                           | 2.07                 |
| <b>Ofu Vaoto Marine Park</b>                                   | Territorial             | No Management Plan                           | 0.38                 |
| <b>Pago Pago Harbor Special Management Area</b>                | Territorial             | No Management Plan                           | 1.62                 |
| <b>Poloa Village Marine Protected Area</b>                     | Territorial             | Community Agreement                          | 0.36                 |
| <b>Rose Atoll (American Samoa) - no take MPA</b>               | Federal                 | Non-MPA Programmatic Habitat Management Plan | 1790.81              |
| <b>Rose Atoll Marine National Monument</b>                     | Federal                 | In Draft                                     | 34,836.97            |
| <b>Rose Atoll National Wildlife Refuge</b>                     | Federal                 | Site-Specific Management Plan                | 6.75                 |
| <b>Sa'ilele Village Marine Protected Area</b>                  | Territorial             | Community Agreement                          | 0.08                 |
| <b>Vatia Village Marine Protected Area</b>                     | Territorial             | Community Agreement                          | 0.62                 |

Notes:\* indicates area data are not available for this site; data from 2014 NOAA Marine Protected Areas Inventory.

## Discussion

Based on the survey findings, a few general conclusions about the population of American Samoa and their interaction with coral reefs can be made. These can be considered preliminary findings, and more detailed analyses of this data are planned for the future (after indicators from secondary data are finalized). We propose a few suggestions for future research at the end of this section.

With respect to **participation in reef activities**, purely recreational coral reef related activities (SCUBA diving, snorkeling) are relatively uncommon in American Samoa, with the exception of swimming and other recreational activities on the beach. Residents participate more frequently in recreational activities in semi-urban villages than in rural or urban villages.

Fishing and gathering of resources are some of the more common nearshore reef related activities. Our findings show that over 30% of households stated that they engaged in fishing or gathering at least once per month. The survey found that 78% of households eat fish/seafood once a week or more, and that most fishers (87%) do not sell the fish they catch; however, it is uncertain what proportion of fish protein consumed comes from coral reef vs. non-coral reef fish species, as this distinction was not specified in the survey. Seafood is also purchased in supermarkets, some of which is sourced from outside the territory.

Survey respondents were asked their perceptions of the health of American Samoa's coral reef resources. The finding showed that residents of urban areas perceived **resource conditions** to be in the worst condition, whereas residents of rural areas generally perceived resources to be in better condition. That is, urban residents had a less favorable perception of coral reef ecosystem health when compared to rural areas. The fact that coral reef health varies by location may, in part, explain the lack of consensus regarding the condition of marine resources at the jurisdictional level.

Regarding the public's **awareness and knowledge of coral reefs**, this study found that the majority of the population stated that they are familiar with threats facing coral reefs (all threat types). That being said, less than a third of the population believed that the condition of coral reef resources would get worse in the next 10 years. This may illustrate a confidence amongst American Samoans that current threats to coral reefs are being effectively addressed.

The study found that the public's **attitudes towards coral reef management strategies and enforcement** was largely positive. Residents expressed support for most of the current marine management measures in place in the territory. In particular, 82% of the respondents surveyed support community-based village MPAs and 78% support temporary fishing closures. The only management measure not supported by a majority of respondents was the ban on fishing "big fish" species (e.g., bumphead parrotfish, humphead wrasse, giant grouper, and sharks).

Generally, respondents supported marine management policies and regulations, regardless of their reliance on marine resources.

We also attempted to track public participation and attitudes with respect to the **governance** of coral reefs and their resources. While 70% of all MPAs in American Samoa have management plans in place, we were unable to assess the strength of these plans. There appears to be a moderate level of participation from individuals in activities to protect and manage coral reefs. The survey also found that American Samoan residents rely on and trust both federal and local government information sources regarding coral reef topics. It is interesting to note that church and village leaders were not frequently listed as trusted sources of information by those who utilize these sources. Those who did state that church and village leaders were trusted information sources were significantly more likely to be highly reliant on fishing, suggesting that churches and village leaders may be an appropriate means of outreach for future fisheries management strategies.

The collection of **secondary data**, including economic impacts of tourism and fishing, as well as data contributing to the development of some of the community well-being indicators, will continue over time. As updated data sets are produced by relevant agencies, these will be sourced and housed with the existing data sets, and will be used to track changes over time. These data may be incorporated into indicators that combine or compare biophysical parameters (e.g., fish biomass) with landings information or public perceptions of general reef health.

### ***Future approaches and research ideas.***

There were a few lessons learned from this first NCRMP socioeconomic data collection in American Samoa. As similar surveys are implemented across other U.S. coral reef jurisdictions, the NCRMP team will be making adjustments to the data collection effort to improve on the type of information being generated. These findings can be considered as a starting point to develop more detailed research questions for future work. For example, there is a need to fine-tune the question on fish consumption and fishing activity to make it more specific to coral reef related fish and invertebrate species, as well as distinguish between locally caught and imported fish. The monitoring team will also aim to improve the level of comparability of questions across the different jurisdictions while maintaining questions that will provide information specifically relevant to the local context and management needs in American Samoa.

Another future research direction would be to conduct analyses that explore relationships between different socioeconomic indicators, as well as comparisons between sub-populations as defined by the sampled respondents. These may include categories such as: age, gender, or familiarity with coral reefs, among others. For example, our results show that there is minimal difference in the perceptions of those who fish vs. those who do not fish in relation to their attitudes towards MPAs and most coral reef management measures. Preliminary analyses suggest

that the one exception is that fishermen were more likely to disagree with the expansion of Fagatele Bay Sanctuary, but 50% still stated they were supportive of the expansion. The study also found that resource extraction is more common in rural and semi-urban regions.

Other potential improvements include the elicitation of public awareness of climate change and ocean acidification and their potential impacts on humans. This might include adaptation measures that are perceived to be more effective for community resiliency. Additional improvements to the survey instrument might include better distinguishing the sources of information on coral reefs and level of trustworthiness. This could provide information that could be incorporated into specific public outreach and education programs for current and future management measures.

This data collection builds on and supplements the considerable social science research that has been conducted in American Samoa to date. Integrating NCRMP data with these studies, or comparing and contrasting findings, has the potential to provide a more complete understanding of human interactions with coral reef resources in the territory. For instance, Kilarski et. al.'s (2006) survey of American Samoa residents provides a baseline that may allow us to see changes in certain variables over time. Historically oriented studies, including work conducted by Armstrong et. al. (2011) and Levine and Sauafea-Leau (2013) can also provide a baseline to examine how practices, culture, and norms may have changed over time in the territory. Village-specific data collections, including Jacob (2009), Wongbusarakum (2009), and Levine and Kilarski (2015) can be compared to the territory-wide trends examined under the NCRMP study. Levine and Richmond's (2014, 2015) analysis of fisheries co-management also provide a useful lens for analysis of resident perceptions of fisheries and management analyzed under NCRMP. At the highest level, NCRMP socioeconomic data are intended to allow for analyses across jurisdictions and regions (e.g. comparisons of Pacific to Caribbean) and within a single jurisdiction over time. These investigations will be, in large part, aimed at answering questions related to the success of coral reef conservation efforts.

In future years, we intend to adjust our jurisdictional sampling schedule to enable us to increase the total sample size and survey the entire jurisdiction of American Samoa, including the Manu'a Islands. This will enable comparisons between more urbanized Tutuila and the more remote and less developed villages in Manu'a. Expanding our survey sample will improve our ability to compare NCRMP socioeconomic data to biophysical data collected by NCRMP and jurisdictional agencies (for instance, comparing perceived coral reef resource condition to biological indicators), and to inform coral reef management and monitoring across the entire jurisdiction. Finally, ongoing analyses of the individual metrics presented here will move us toward reporting the survey and secondary data collection results for a variety of composite indicators such as governance and perceived resource condition. These indicators will aid in comparisons across jurisdictions, where individual metrics may not be the same. Further, the use of indicators will support communication of complex data in a way that facilitates decision making.



Community-based fisheries management area in the villages of Matu'u and Faganeanea (A. Levine)

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# **Appendix 1    National Coral Reef Monitoring Program**

## **Understanding Socioeconomic Connections**

The Socioeconomic Component of the National Coral Reef Monitoring Plan (NCRMP) gathers and monitors a collection of socioeconomic variables, including demographics in coral reef areas, human use of coral reef resources, as well as knowledge, attitudes, and perceptions of coral reefs and coral reef management. The overall goal of the socioeconomic monitoring component is to track relevant information regarding each jurisdiction's population, social and economic structure, the impacts of society on coral reefs, and the impacts of coral management on communities. NOAA's Coral Reef Conservation Program (CRCP) will use the information for research and to improve the results of programs designed to protect coral reefs.

The main purpose of the Socioeconomic Component of NCRMP is to answer the following questions: What is the status of human knowledge, attitudes, and perceptions regarding coral reefs? And, how are human uses of, interactions with, and coral dependence on coral reefs changing over time?

More details can be found here: <http://www.coris.noaa.gov/monitoring/socioeconomic.html>

## Appendix 2    The NCRMP Survey Instrument

### OMB SUBMISSION

NOAA Coral Reef Conservation Program  
National Coral Reef Monitoring Program  
Resident Coral Reef Survey  
OMB Control Number 0648-0646

**\*\*American Samoa Survey\*\***

*Survey conducted in (circle one):*

*Samoan*

*English*

Introduction: Talofa. My name is \_\_\_\_\_. We are conducting a survey of residents in American Samoa and are interested in obtaining your opinions on some important issues related to coral reefs and the environment in American Samoa. Your participation is voluntary and will be kept strictly confidential.

## PARTICIPATION IN REEF ACTIVITIES

1. How often do you usually participate in each of the following activities? [Q14]

|  | Never | Once a month or less | 2-3 times a month | 4 times a month or more | No Response |
|--|-------|----------------------|-------------------|-------------------------|-------------|
| Swimming/wading  |       |                      |                   |                         |             |
| Snorkeling   |       |                      |                   |                         |             |
| Diving (SCUBA or free diving)                                    |       |                      |                   |                         |             |
| Waterside/ beach camping   |       |                      |                   |                         |             |
| Beach recreation (beach sports, picnics)                         |       |                      |                   |                         |             |
| Boating  |       |                      |                   |                         |             |
| Outrigger canoe/Fautasi  |       |                      |                   |                         |             |
| Surfing  |       |                      |                   |                         |             |
| Fishing  |       |                      |                   |                         |             |
| Gathering of marine resources (lobsters, conch, seaweed, palolo) |       |                      |                   |                         |             |

**SKIP PATTERN--** If respondent answers 'never' to fishing or gathering of marine resources, then skip to #3:

## CORAL REEF RELIANCE / CULTURAL IMPORTANCE OF REEFS

2. How often do you fish or harvest marine resources (includes all fishing and harvesting of shells, octopus, lobster, sea cucumber, or other non-fish species) for each of the following reasons? [Q112]

|   | Frequently | Sometimes | Rarely | Never | No Response |
|---|------------|-----------|--------|-------|-------------|
| To feed myself and my family/ household           |            |           |        |       |             |
| To sell   |            |           |        |       |             |
| To give to extended family members and/or friends |            |           |        |       |             |
| To give to pastors and village leaders)           |            |           |        |       |             |
| For fun   |            |           |        |       |             |
| For special occasions and cultural events (e.g.,  |            |           |        |       |             |

|               | Frequently | Sometimes | Rarely | Never | No Response |
|---------------|------------|-----------|--------|-------|-------------|
| fa'alavelave) |            |           |        |       |             |

3. How often does your family eat fish/seafood? [Guam Survey]
- Every day
  - A few times a week
  - About once a week
  - 1-3 times a month
  - Less than once a month
  - Never

**SKIP PATTERN-- If respondent answers f. Never, skip to question #5**

4. Where do you get the fish or seafood your family eats? Please pick the top 2. [Guam Survey]
- Purchased by myself or someone in my household at a store or restaurant
  - Purchased by myself or someone in my household at a market or roadside vendor
  - Caught by myself or someone in my household
  - Caught by extended family members
  - Other, please specify \_\_\_\_\_

**PERCEIVED RESOURCE CONDITION**

5. In your opinion, how are American Samoa's marine resources currently doing? Please rank from very bad to very good. [Q50]

|   | Very Bad | Bad | Neither Bad nor Good | Good | Very Good | Not sure |
|---|----------|-----|----------------------|------|-----------|----------|
| <b>Ocean Water Quality (clean and clear)</b>                  |          |     |                      |      |           |          |
| <b>Amount of Coral</b>  |          |     |                      |      |           |          |
| <b>Number of Fish</b>   |          |     |                      |      |           |          |
| <b>Number of Faisua (Giant Clams)</b>                         |          |     |                      |      |           |          |
| <b>Amount of animals for gleaning (shells, octopus, etc.)</b> |          |     |                      |      |           |          |

6. How would you say the condition of each of the following has changed over the last 10 years: from 1=it has gotten a lot worse to 5=it has gotten a lot better. [Q53]

|  | A lot Worse | Somewhat Worse | No Change | Somewhat Better | A lot Better | Not Sure |
|--|-------------|----------------|-----------|-----------------|--------------|----------|
| Ocean Water Quality (clean and clear)                  |             |                |           |                 |              |          |
| Amount of Coral  |             |                |           |                 |              |          |
| Number of Fish   |             |                |           |                 |              |          |
| Number of <i>Faisua</i> (Giant Clams)                  |             |                |           |                 |              |          |
| Amount of animals for gleaning (shells, octopus, etc.) |             |                |           |                 |              |          |

7. In the next 10 years, do you think the condition of the marine resources in American Samoa will get worse, stay the same or improve? [Guam Survey]
- Get worse
  - Stay the same
  - Improve
  - Not sure

#### AWARENESS AND KNOWLEDGE OF CORAL REEFS

8. Please say whether you disagree or agree with each of the following statements. [Q7, Guam Survey]

|  | Strongly Disagree | Disagree | Neither | Agree | Strongly Agree | Not Sure |
|--|-------------------|----------|---------|-------|----------------|----------|
| Coral reefs protect the American Samoa from erosion and natural disasters. |                   |          |         |       |                |          |
| Coral reefs are only important to fishermen, divers and snorkelers.        |                   |          |         |       |                |          |
| Healthy coral reefs attract tourists to American Samoa.                    |                   |          |         |       |                |          |
| Coral reefs are important to American Samoa culture.                       |                   |          |         |       |                |          |

9. How familiar are you with each of the following potential threats facing the coral reefs in American Samoa? [Q31]

|   | Very Unfamiliar | Unfamiliar | Neither Familiar nor Unfamiliar | Familiar | Very Familiar | Not sure |
|---|-----------------|------------|---------------------------------|----------|---------------|----------|
| Climate change  |                 |            |                                 |          |               |          |
| Coral bleaching   |                 |            |                                 |          |               |          |
| Hurricanes and other natural disasters                                  |                 |            |                                 |          |               |          |
| Pollution (stormwater, wastewater, chemical runoff and trash/littering) |                 |            |                                 |          |               |          |
| Coastal/urban development   |                 |            |                                 |          |               |          |
| Invasive species  |                 |            |                                 |          |               |          |
| Too much fishing and gathering  |                 |            |                                 |          |               |          |
| Damage from ships and boats   |                 |            |                                 |          |               |          |
| <i>Crown of Thorn starfish outbreaks (alamea)</i>                       |                 |            |                                 |          |               |          |
| <i>Coral disease</i>  |                 |            |                                 |          |               |          |

10. Do you believe that the threats to coral reefs in American Samoa are: [MODIFIED Q29]

- a. Extreme
- b. Large
- c. Moderate
- d. Minimal
- e. None
- f. Not sure

**ATTITUDES TOWARDS CORAL REEF MANAGEMENT STRATEGIES AND ENFORCEMENT**

11. A Marine Protected Area is an area of the ocean where human activity is typically restricted to protect living, non-living, cultural, and/or historic resources. How familiar are you with Marine Protected Areas (MPAs)? [Q36]

- a. Very Unfamiliar
- b. Unfamiliar
- c. Neither Unfamiliar nor Familiar
- d. Familiar
- e. Very Familiar
- f. Not sure

**SKIP PATTERN-- If respondent answers a 'Very unfamiliar' or b 'Unfamiliar', then skip to #12:**

12. Please indicate how much you disagree or agree with each of the following statements. [MODIFIED Q44]

|  | Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree | Not Sure |
|--|-------------------|----------|----------------------------|-------|----------------|----------|
| MPAs protect coral reefs   |                   |          |                            |       |                |          |
| MPAs increase the number of fish   |                   |          |                            |       |                |          |
| There should be fewer MPAs in American Samoa   |                   |          |                            |       |                |          |
| There should be more MPAs in American Samoa  |                   |          |                            |       |                |          |
| There has been economic benefit to American Samoa from the establishment of MPAs   |                   |          |                            |       |                |          |
| Fishermen's livelihoods have been negatively impacted from the establishment of MPAs in American Samoa                                       |                   |          |                            |       |                |          |
| MPAs help increase tourism in American Samoa   |                   |          |                            |       |                |          |
| The establishment of MPAs increases the likelihood that people will vacation in American Samoa   |                   |          |                            |       |                |          |
| I would support adding new MPAs in American Samoa if there is evidence that the ones we have are improving American Samoa's marine resources |                   |          |                            |       |                |          |
| I generally support the establishment of MPAs  |                   |          |                            |       |                |          |

### AWARENESS OF CORAL RULES AND REGULATIONS

13. The following are management measures intended to improve the protection of coral reefs in <location>. Please rate whether you oppose or support each of the following: [Q103]

| Rules/Regulations  | Strongly Oppose | Oppose | Neither Support nor Oppose | Support | Strongly Support | Don't Know |
|--|-----------------|--------|----------------------------|---------|------------------|------------|
| <i>Invertebrate size restrictions</i>  |                 |        |                            |         |                  |            |
| <i>Fishing gear restrictions</i>   |                 |        |                            |         |                  |            |
| <i>Ban on shark fishing OR ban of fishing "big fish" species including bumphead parrotfish, humphead wrasse, giant grouper</i> |                 |        |                            |         |                  |            |

| Rules/Regulations   | Strongly Oppose | Oppose | Neither Support nor Oppose | Support | Strongly Support | Don't Know |
|---|-----------------|--------|----------------------------|---------|------------------|------------|
| <i>Expansion of Fagatele National Marine Sanctuary</i>    |                 |        |                            |         |                  |            |
| <i>Establishing community-based Village MPAs</i>          |                 |        |                            |         |                  |            |
| <i>Establishing permanent no-take MPAs</i>                |                 |        |                            |         |                  |            |
| <i>Establishing areas with temporary fishing closures</i> |                 |        |                            |         |                  |            |

**PARTICIPATION IN BEHAVIORS THAT MAY IMPROVE CORAL HEALTH**

14. How often do you participate in any activity to protect the environment (for example, beach clean ups, volunteering with an environmental group)? [MODIFIED Q89]

- a. Not At All
- b. Once a year or Less
- c. Several times a year
- d. At least once a month
- e. Several Times a Month or more
- f. Not Sure

15. Which of the following would you consider to be your top 3 sources of information about coral reefs and the environment in American Samoa? ***[interviewer checks the top 3 sources of information in box below]*** [Q105]

16. To what degree do you trust each of your top rated sources of information to provide you the most accurate information on coral reefs and coral reef related topics in American Samoa? ***[respondent rates only the top 3 sources of information in box below]*** [Q109]

| Top 3 | Sources                              | Very untrustworthy | Untrustworthy | Neither Trustworthy nor Untrustworthy | Trustworthy | Very Trustworthy | Not sure |
|-------|--------------------------------------|--------------------|---------------|---------------------------------------|-------------|------------------|----------|
|       | Newspapers, other print publications |                    |               |                                       |             |                  |          |
|       | Radio                                |                    |               |                                       |             |                  |          |
|       | TV                                   |                    |               |                                       |             |                  |          |

| Top 3 | Sources   | Very untrustworthy | Untrustworthy | Neither Trustworthy nor Untrustworthy | Trustworthy | Very Trustworthy | Not sure |
|-------|---|--------------------|---------------|---------------------------------------|-------------|------------------|----------|
|       | Internet  |                    |               |                                       |             |                  |          |
|       | Friends and family  |                    |               |                                       |             |                  |          |
|       | Community leaders   |                    |               |                                       |             |                  |          |
|       | Church leaders  |                    |               |                                       |             |                  |          |
|       | Government of American Samoa (Dept. of Marine and Wildlife, AS EPA, Coastal Management Program) |                    |               |                                       |             |                  |          |
|       | Federal government agencies (NOAA, National Parks, US EPA)                                      |                    |               |                                       |             |                  |          |
|       | Other: _____  |                    |               |                                       |             |                  |          |

17. How involved is the local community in protecting and managing coral reefs? [Q97]

- a. Not at all involved
- b. Somewhat involved
- c. Moderately involved
- d. Involved
- e. Very involved
- f. Not sure

18. How involved are you in making decisions related to the management of coral reefs in American Samoa? [Q90]

- a. Not at all involved
- b. Slightly involved
- c. Moderately involved
- d. Involved
- e. Very involved
- f. Not sure

## DEMOGRAPHICS

I just have a few more questions that will help us to interpret our results. As a reminder, the information you provide is completely confidential.

19. Are you male or female? [Q122]

- a. Male
- b. Female

20. What is your year of birth? \_\_\_\_\_ [Q121]

21. How long have you lived in American Samoa? [Q129]

- a. 1 year or less
- b. 2-5 years
- c. 6-10 years
- d. more than 10 years
- e. all my life

22. Including your primary language, please name each language you speak. [*interviewer should not read options below, but should allow respondent to answer*] [Q133]

- |               |                           |
|---------------|---------------------------|
| 1. English    | 13. Hawaiian              |
| 2. Spanish    | 14. Hawaii Pidgin English |
| 3. French     | 15. Sāmoan                |
| 4. German     | 16. Chamorro              |
| 5. Italian    | 17. Carolinian            |
| 6. Portuguese | 18. Creole                |
| 7. Arabic     | 19. Crucian               |
| 8. Chinese    | 20. Tongan                |
| 9. Japanese   | 21. Other: Please list    |
| 10. Korean    | _____                     |
| 11. Tagalog   | 22. No Response           |
| 12. Hindi     |                           |

23. What race/ethnicity do you consider yourself? [*interviewer should not read options below, but should allow respondent to answer*] [Q131]

- |               |   |
|---------------|---|
| 1. Chamorro   | 14. Native Hawaiian or other Pacific Islander |
| 2. Filipino   | 15. White                                     |
| 3. Carolinian | 16. American Indian or Alaskan Native         |
| 4. Korean     | 17. Other: Please specify                     |
| 5. Yapese     | _____   |
| 6. Kosraen    | 18. No response                               |
| 7. Chuukese   |   |
| 8. Pohnpeian  |   |
| 9. Palauan    |   |
| 10. Chinese   |   |
| 11. Japanese  |   |
| 12. Indian    |   |
| 13. Samoan    |   |

24. What is the highest level of education you have completed? [Q123]

- a. 8th Grade or Less
- b. Some high school
- c. High School Graduate, GED
- d. Some college, community college or AA
- e. College Graduate
- f. Graduate School, Law School, Medical School
- g. No Response

25. What is your current employment status? [Q124]

- a. Unemployed
- b. Student
- c. Employed full-time
- d. Homemaker
- e. Employed part-time
- f. Retired
- g. None of the above: Please specify \_\_\_\_\_
- h. No Response

26. What is your occupation? [*open ended*] \_\_\_\_\_ [Q125]

27. May I ask, what is your annual household income? [Q127]

- a. Under \$10,000
- b. \$10,000-19,999
- c. \$20,000-29,999
- d. \$30,000-39,999
- e. \$40,000-49,999
- f. \$50,000-59,999
- g. \$60,000-74,999
- h. \$75,000-99,999
- i. \$100,000-149,999
- j. \$150,000 or More
- k. No Response

[Interviewer: Please note the village within which you completed the respondent's survey]

THANK YOU FOR YOUR TIME

*If you would like a copy of the results, please provide us with your mailing address or email address (write on separate contact sheet that is not linked to survey answers).*

## SAMOAN VERSION

Nu'u: \_\_\_\_\_ Tagata Fa'atautaia le su'esu'ega \_\_\_\_\_

Aso: \_\_\_\_\_ Fale Numera / fa'amatalaga: \_\_\_\_\_

Survey conducted in (circle one): Samoan / English

Talofa. O lo'u igoa o \_\_\_\_\_. Ua matou fa'atautaia leni su'esu'ega e maua ai le silafia i manatu o tagata i tulaga taua e fa'atatau i a'au 'amu ma le si'osi'omaga i totonu o Amerika Samoa. O lo'o matou faia nei su'esu'ega i maota I totonu o Tutuila, ma o lou maota lea ua filifilia e fa'atautaia ai leni fa'amoemoe.

E tusa e 20-30 minute e fa'atautaia ai leni su'esu'ega, ma o le foa'i atu se meaalofo fa'atauva'a aua lou auai i leni fa'amoemoe. E leai se afaina pe a e le fia auai i leni su'esu'ega, ma o tali po'o fa'amaumauga ete tu'uina mai e le mafai ona fa'asoa atu i se tagata.

O leni su'esu'ega ua lagolagoina e le NOAA's Coral Reef Conservation Program ma o lo'o fa'atautaia e le San Diego State University Research Foundation. O su'esu'ega fa'apenei o lo'o fa'atautaia fo'i i nisi vaega o le United States.

If ask:

If you have any questions (or would like additional information about this survey), please see the NCRMP website:

[http://www.coris.noaa.gov/activities/projects/ncrmp\\_socio/documents/ncrmp\\_socio\\_econ\\_onepager.pdf](http://www.coris.noaa.gov/activities/projects/ncrmp_socio/documents/ncrmp_socio_econ_onepager.pdf)

Or contact:

Arielle Levine  
Assistant Professor  
San Diego State University  
5500 Campanile Dr., San Diego, CA 92182-4493  
alevine@mail.sdsu.edu

or

Peter Edwards  
Natural Resource Economist and Social Science Coordinator  
Coral Reef Conservation Program  
IMSG – NOAA/NOS, Office of Ocean and Coastal Resource Management  
1305 East West Highway, Silver Spring, MD, 20910  
peter.edwards@noaa.gov

(This information will also be available on a contact card to hand out.)

**Auai i ni tulaga o fa'atinoina i luga o le gataifale**

1. E fa'afia ona e auai i tulaga nei?

|   | E le'i faia | Fa'atasi i le masina pe itiiti | 2-3 taimi i le masina | 4 taimi i le masina pe sili atu | Leai se tali |
|---|-------------|--------------------------------|-----------------------|---------------------------------|--------------|
| Auau  |             |                                |                       |                                 |              |
| Auau e fa'aaoga le mata ma le mea manava              |             |                                |                       |                                 |              |
| Tofu e fa'aaoga le tane ea                            |             |                                |                       |                                 |              |
| Fa'aaogaina o le matafaga mo mafutaga (beach camping) |             |                                |                       |                                 |              |
| Fa'aaogaina o le matafaga mo ta'alogaga ma evaga      |             |                                |                       |                                 |              |
| Fa'aaogaina o va'a                                    |             |                                |                       |                                 |              |
| Fa'aaogaina o le paopao po'o le fautasi               |             |                                |                       |                                 |              |
| Fa'ase'e i luga o galu                                |             |                                |                       |                                 |              |
| Fagota  |             |                                |                       |                                 |              |
| Aoina o figota po'o meaola mai le sami                |             |                                |                       |                                 |              |

*\*A tali "E le'i faia" le fagota ma le aoina o figota mai le sami, ona fa'aaauau leai i le fesili #3*

**O LE TAUUA O Æ'AU 'AMU I LE AGANU'U**

2. E fa'afia ona e fagota mo tulaga o lo'o ta'ua i lalo (e aofia ai fagotaga uma ma le fagotaina o figota?)

|   | Fa'afia | Isi o taimi | Seasea | E le'i faia | Leai se tali |
|---|---------|-------------|--------|-------------|--------------|
| Mo le fofoga tausami a a'u ma la'u aiga     |         |             |        |             |              |
| E fa'atau atu                               |         |             |        |             |              |
| E tufaina atu mo aiga ma uo                 |         |             |        |             |              |
| E tufaina atu mo faifeau ma matai a le nu'u |         |             |        |             |              |
| Mo fiafiaga                                 |         |             |        |             |              |
| Mo fa'alavelave                             |         |             |        |             |              |

3. E fa'afia ona taumafa lou aiga i se i'a/mea'ai sami?
  - a. Aso uma
  - b. Salasala taimi i le vaiaso
  - c. Fa'atasi i le vaiaso
  - d. 1-3 taimi i le masina
  - e. E le atoa se masina
  - f. E le'i faia

**A tali "E le'i faia", ona fa'aauau lea i le fesili #5**

4. O fea e aumai ai i'a po'o mea'ai sami e tausami lou aiga? Fa'amolemole filifili mai le lua (failogaina I le 1 ma le 2).
  - f. \_\_\_\_ Fa'atau mai e a'u po'o se tasi i totonu o lo'u aiga mai le faleoloa po'o se faleaiga
  - g. \_\_\_\_ Fa'atau mai e a'u po'o se tasi i totonu o lo'u aiga mai le maketi po'o tafa-ala
  - h. \_\_\_\_ Fagotaina e a'u po'o se tasi i totonu o lo'u aiga
  - i. \_\_\_\_ Fagotaina e se tasi mai i lo'u aiga faitele
  - j. \_\_\_\_ Fagotaina e a'u uo
  - k. \_\_\_\_ O isi, fa'ailoa mai \_\_\_\_\_

**TULAGA O LE TAMAOAIGA**

5. O le a sou manatu, e fa'aapefea le tulaga o le tamaoaiga i le sami i Amerika Samoa? Fa'amolemole fa'atulaga mai i le leaga tele i le lelei tele.

|  | Leaga tele | Leaga | E le o leaga po'o | Lelei | Lelei tele | E le maunitio |
|--|------------|-------|-------------------|-------|------------|---------------|
| Tulaga o le Sami (Mama ma le manino)               |            |       |                   |       |            |               |
| Aofaiga o 'Amu                                     |            |       |                   |       |            |               |
| Numera o i'a                                       |            |       |                   |       |            |               |
| Aofaiga o figota I le aloalao (fe'e, sisi, ma isi) |            |       |                   |       |            |               |

6. E fa'aapefea ona e fa'amatalaina le tulaga ua iai le suiga mai le 10 tausaga talu ai?

|  | Fa'atuputel eina le leaga | Feololo le leaga | Leai se suiga | Feololo le lelei | Fa'atuputel eina le lelei | E le maunitio |
|--|---------------------------|------------------|---------------|------------------|---------------------------|---------------|
|  |                           |                  |               |                  |                           |               |

|   | Fa'atuputel<br>eina le<br>leaga | Feololo le<br>leaga | Leai se<br>suiga | Feololo le<br>lelei | Fa'atuputel<br>eina le lelei | E le<br>mautinoa |
|---|---------------------------------|---------------------|------------------|---------------------|------------------------------|------------------|
| Tulaga o le Sami (Mama ma le manino)                  |                                 |                     |                  |                     |                              |                  |
| Aofaiga o 'Amu  |                                 |                     |                  |                     |                              |                  |
| Numera o i'a  |                                 |                     |                  |                     |                              |                  |
| Aofaiga o figota i le aloalao (fe'e, sisi,<br>ma isi) |                                 |                     |                  |                     |                              |                  |

7. I le 10 tausaga o i luma, o le a sou iloa I le tulaga o le iai le tamaoaiga o le gataifale I totonu o Amerika Samoa pe o le a fa'atuputeleina le leaga, pe tumau pea e leai se suiga, pe suia i le lelei?
- Fa'atuputeleina le leaga
  - Tumau pea e leai se suiga
  - Suia i le lelei
  - E le mautinoa

#### FA'AILOA MA LOU SILAFIA I A'AU 'AMU

8. Fa'amolemole fa'ailoa mai pe ete fa'atui'ese pe ete ioe i fa'amatalaga ua ta'ua i lalo.

|  | Fa'atuies<br>e malosi | Fa'atuies<br>e | Fa'atuies<br>e pe lē | Ioe | Ioe<br>malosi | E lē<br>mautinoa |
|--|-----------------------|----------------|----------------------|-----|---------------|------------------|
| O a'au 'amu e puipui Amerika Samoa mai sologa ma tafega po'o mala fa'alenuma |                       |                |                      |     |               |                  |
| O a'au 'amu e taua mo na'o tagata fagota, tagata moulu, ma tagata auau       |                       |                |                      |     |               |                  |
| O a'au 'amu olaola lelei e fa'atosina mai ai turisi i Amerika Samoa          |                       |                |                      |     |               |                  |
| O a'au 'amu e taua tele i le aganu'u o Amerika Samoa                         |                       |                |                      |     |               |                  |

9. O le a sou iloa i tulaga o lo'o ta'ua mai i lalo i fa'afitauli o a'afia ai a'au 'amu a Amerika Samoa?

|  | E matua lē<br>lava so'u<br>iloa | Oute lēiloa | Oute lē iloa<br>pe iloa iai | Oute iloa | E matua lava<br>lo'u iloa | E lē<br>mautinoa |
|--|---------------------------------|-------------|-----------------------------|-----------|---------------------------|------------------|
|  |                                 |             |                             |           |                           |                  |

|  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|
| Fesuaiga o le tau  |  |  |  |  |  |  |
| Ua suia le lanu o le 'amu  |  |  |  |  |  |  |
| Afa ma a'afiaga fa'alenua  |  |  |  |  |  |  |
| Otaota (lapis lafoa'i, otaota mai alavai, lologa vai mai tumiga ma tafega) |  |  |  |  |  |  |
| Galuega o lo'o fa'atino i autafa o le sami                                 |  |  |  |  |  |  |
| Meaola fa'atama'ia   |  |  |  |  |  |  |
| So'ona fagota  |  |  |  |  |  |  |
| A'afiaga mai va'a  |  |  |  |  |  |  |
| Alamea   |  |  |  |  |  |  |

10. E te talitonu o a'afiaga i ā'au 'amu a Amerika Samoa e:

- g. Matua telē
- h. E telē
- i. Feololo
- j. E itiiti
- k. E leai se mea
- l. E lē mautinoa

### O MANATU MA LAGONA I LE PUIPUIINA O Ā'AU 'AMU MA LE FA'AMALOSIA O TULAFONO

11. O le gataifale fa'asao o se vaega sami lea ua fa'asaina ona fa'atino ai ni tulaga e puipui ai le tamaoaiga O le a sou silafia I lea gataifale fa'asao?

- g. Matua lē silafia
- h. Lēsilafia
- i. E lē silafia pe silafia
- j. Silafia
- k. Matua silafia
- l. E lēmautinoa

**A tali mai I le "Matua le silafia" po'o le "Le silafia", ona fa'aauau lea I le #12:**

12. Fa'amolemole fa'ailoa mai lou fa'atuiese po'o lou ioe i fa'amatalaga ua ta'ua i lalo.

|                                       | Fa'atuiese malosi | Fa'atuiese | E lē ioe pe fa'atuiese | ioe | ioe malosi | E lē mautinoa |
|---------------------------------------|-------------------|------------|------------------------|-----|------------|---------------|
| Gataifale fa'asao e puipuia ā'au 'amu |                   |            |                        |     |            |               |

|  | Fa'atuiese malosi | Fa'atuiese | E lē ioe pe fa'atuiese | ioe | ioe malosi | E lē mautinoa |
|--|-------------------|------------|------------------------|-----|------------|---------------|
| Gataifale fa'asao e fa'atuputeleina le fuainumera o i'a  |                   |            |                        |     |            |               |
| E tatau ona fa'aititia gataifale fa'asao i totonu o Amerika Samoa  |                   |            |                        |     |            |               |
| E tatau ona fa'ateleina gataifale fa'asao i totonu o Amerika Samoa   |                   |            |                        |     |            |               |
| E maua alamanuia o Amerika Samoa mai le fa'avaeina o gataifale fa'asao   |                   |            |                        |     |            |               |
| O le tausiga o aiga a tagata fagogota ua a'afia mai le fa'avaeina o gataifale fa'asao i Amerika Samoa  |                   |            |                        |     |            |               |
| O gataifale fa'asao e fesoasoani I le fa'atuputeleina o turisi i totonu o Amerika Samoa  |                   |            |                        |     |            |               |
| Oute lagolagoina le fa'aopopoina o gataifale fa'asao fou I totonu o Amerika Samoa pe a fai e iai ni fa'amaoniga o lo'o alualu lelei le tamaoiga mai i gataifale fa'asao o lo'o iai nei |                   |            |                        |     |            |               |
| Oute lagolagoina le fa'avaeina o gataifale fa'asao   |                   |            |                        |     |            |               |

## FA'AILOAINA MA SILAFIA TULAFONO O Ā'AU 'AMU

13. O tulaga o lo'o ta'ua i lalo o lo'o fa'aaogaina aua le puipui o le si'osi'omaga o le sami i Amerika Samoa. Matou te fia iloa sou manatu i le fa'aaogaina o nei tulaga aua le puipuiina o ā'au 'amu. Fa'amolemole, fa'ailoa mai lou fa'atuiese po'o lou ioa i nei tulaga:

|  | Fa'atuiese malosi | Fa'atuiese | E lēioe pe fa'atuiese | ioe | ioe malosi | E lē mautinoa |
|--|-------------------|------------|-----------------------|-----|------------|---------------|
| Fa'asa on fagotaina i'a lapo'a e iai Uluto'i, Laea-uluto'i, Lalafi, Tagafa, Ata'ata-uli, Vaolo |                   |            |                       |     |            |               |
| O le fa'alauteleina o le Sanctuary   |                   |            |                       |     |            |               |

|   | Fa'atui ese<br>malosi | Fa'atui ese | E lēioe pe<br>fa'atui ese | loe | loe malosi | E lē mautinoa |
|---|-----------------------|-------------|---------------------------|-----|------------|---------------|
| Fa'avaeina o gataifale fa'asao i nu'u                       |                       |             |                           |     |            |               |
| Fa'avaeina o gataifale fa'asao tumau                        |                       |             |                           |     |            |               |
| Fa'avaeina o ogasami fa'asao mo faigafaiva<br>fa'atulagaina |                       |             |                           |     |            |               |

### AUAI I GAIOIGA E FA'ALELEIA AI LE OLAOLA LELEI O 'AMU

14. E fa'afia ona e auai i so'o se gaiogiga mo le puipuia o le si'osi'omaga (fa'ata'ita'iga, fa'amama matafaga, taeina o le otaota, fa'amamaina o lapisi lafo'ai I totonu o le gataifale, nisi)?
- g. E leai lava
  - h. Fa'atasi i le tausaga pe itiiti
  - i. Fa'atele i le tausaga
  - j. Fa'atasi i le masina
  - k. Fa'atele I le masina pe sili atu fo'i
  - l. E lē mautinoa
15. Fa'ailoa mai po'o a tulaga o e fa'amoemoe ai mo le mauaina o fa'amaumauga ma fa'amatalaga mautinoa o a'au 'amu i totonu o Amerika Samoa?

| Taua<br>tele | Tulaga o lo'o maua mai ai fa'amatalaga | E lē matua<br>fa'amoemoeina | E lē<br>fa'amoemoeina | E fa'amoemoeina<br>lē<br>fa'amoemoeina | Fa'amoemoeina | Matua<br>fa'amoemoeina | E lē mautinoa |
|--------------|--|-----------------------------|-----------------------|--|---------------|------------------------|---------------|
|              | Nusipepa ma isi tusitusiga             |                             |                       |  |               |                        |               |
|              | Letio                                  |                             |                       |  |               |                        |               |
|              | TV                                     |                             |                       |  |               |                        |               |
|              | Upega tafa'ilagi                       |                             |                       |  |               |                        |               |
|              | Uo ma aiga                             |                             |                       |  |               |                        |               |
|              | Ta'ita'I o fa'alapotopotoga            |                             |                       |  |               |                        |               |

| Taua tele | Tulaga o lo'o maua mai ai fa'amatalaga            | E lē matua fa'amoemoaina | E lē fa'amoemoaina | E fa'amoemoaina pe lē fa'amoemoaina | Fa'amoemoaina | Matua fa'amoemoaina | E lē mautinoa |
|-----------|---|--------------------------|--------------------|-------------------------------------|---------------|---------------------|---------------|
|           | Ta'ita'I o Ekalesia                               |                          |                    |                                     |               |                     |               |
|           | Malo o Amerika Samoa (DMWR, ASEPA, DOC, etc)      |                          |                    |                                     |               |                     |               |
|           | Malo o le Feturale (NOAA, National Parks, US EPA) |                          |                    |                                     |               |                     |               |
|           | O nisi: _____                                     |                          |                    |                                     |               |                     |               |

16. O fea o tulaga ua ta'ua i luga e taua tele ona e fa'amoemoe iai aua fa'amatalaga mo a'au 'amu ma le si'osi'omaga i Amerika Samoa? **[maka le vaega taua tele.]**

17. O le a le auai o lo'o iai tagatanu'u i le puipuiina ma le pulea o ā'au 'amu?

- g. E le o auai
- h. E to'aitiiti le auai
- i. E feololo le auai
- j. E matua auai
- k. E lē mautinoa

18. E fa'apefea ona e auai i faiga o fa'ai'uga aua le pulea o ā'au 'amu o Amerika Samoa?

- g. E le o auai
- h. E to'aitiiti le auai
- i. E feololo le auai
- j. E matua auai
- k. E lē mautinoa

### O LOU TAGATANU'U

**E iai nai fesili ia e fesoasoani lea e fa'amatala atili fa'amaumauga ua iai. E fa'amanatu atu, e le mafai ona fa'asoa atu i fafo ia fa'amaumauga ua e tu'uina mai.**

19. Ituaiga tagata? **[Interviewer check, don't need to ask]**

- c. Ali'i
- d. Tama'ita'i

20. O le a lou tausaga fanau? \_\_\_\_\_

21. O le a le umi sa e aumau ai I totonu o Amerika Samoa?

- f. 1 tausaga pe le'i atoa fo'i
- g. 2-5 tausaga

- h. 6-10 tausaga
- i. Luga atu ma le 10 tausaga
- j. Lo'u olaga atoa

22. Mai I lau gagana masani, fa'amolemole fa'ailoa mai nisi gagana ete silafia. [**interviewer should not read options below, but should allow respondent to answer**]

- |            |   |
|------------|---|
| 1. English | 8. Micronesian languages (please list): _____ |
| 2. Sāmoan  | 9. Hawaii Pidgin                              |
| 3. Tongan  | 10. O nisi: Fa'amolemoe tusi i lalo: _____    |
| 4. Tagalog |   |
| 5. Korean  | 11. E leai se tali                            |
| 6. Chinese |   |
| 7. Spanish |   |

23. O le a le ituaiga tagatanu'u e ta'ua oe? [**interviewer should not read options below, but should allow respondent to answer**]

- 19. Samoan
- 20. Tongan
- 21. Native Hawaiian
- 22. Filipino
- 23. White
- 24. Chinese
- 25. Korean
- 26. O nisi: Fa'amolemoe tusi i lalo: \_\_\_\_\_
- 27. E leai se tali

24. O le a le maualuga o a'oa'oga ua e ausia?
- h. Vasega 8 po'o vasega lalo ifo
  - i. E le'i uma le a'oga maualuga
  - j. Fa'au'u mai i a'oga maualuga
  - k. E le'i uma le kolisi
  - l. Fa'au'u mai i le kolisi
  - m. Fa'au'u mai i polokalama o iunivesete, a'oga fa'aloia, a'oga fa'afoma'i
  - n. E leai se tali

25. O le a lou tulaga faigaluega?
- i. E le o faigaluega
  - j. A'oga
  - k. Nofo fale
  - l. Faigaluega mo sina taimi
  - m. Faigaluega taimi atoa
  - n. Litaea
  - o. E leai se mea o ta'ua i luga: Fa'ailoa mai \_\_\_\_\_
  - p. E leai se tali

26. O le a lau matafaioi? [***Fa'amatalaga***] \_\_\_\_\_

27. O le a le aofaiga o se tupe maua a lou aiga?
- l. Under \$10,000
  - m. \$10,000-19,999
  - n. \$20,000-29,999
  - o. \$30,000-39,999
  - p. \$40,000-49,999
  - q. \$50,000-59,999
  - r. \$60,000-74,999
  - s. \$75,000-99,999
  - t. \$100,000-149,999
  - u. \$150,000 pe luga atu
  - v. E leai se tali

### **Fa'afetai tele mo lau taimi!**

A mana'omia se lomiga o nei fa'amaumauga, fa'amolemole tu'u mail lau pusa meli po'o lau imeli.

## Appendix 3 NCRMP Secondary Data Sources for American Samoa

| <i>Source (originator)</i>  | <i>Data Set Title</i>                               | <i>Publication Date</i> | <i>Abstract</i>   | <i>Data Year(s)</i> | <i>URL</i>  |
|---|---|-------------------------|---|---------------------|---|
| American Samoa Department of Commerce, Statistics Division  | American Samoa Statistical Yearbook 2012            | 2012                    | The 2012 Statistical Yearbook is the thirty-third annual publication of compendia detailing both the historical and current economic and social characteristics of the Territory.   | 2002-2012           | <a href="http://www.doc.as/wp-content/uploads/2011/06/2012-Statistical-Yearbook-1.pdf">http://www.doc.as/wp-content/uploads/2011/06/2012-Statistical-Yearbook-1.pdf</a>                     |
| American Samoa Department of Commerce, Statistics Division  | American Samoa Statistical Yearbook 2013            | 2014                    | This is a compendia detailing both historical and current economic and social characteristics of the Territory.   | 1900-2013           | <a href="http://doc.as.gov/wp-content/uploads/2011/06/2013-Statistical-Yearbook-Final-Draft.pdf">http://doc.as.gov/wp-content/uploads/2011/06/2013-Statistical-Yearbook-Final-Draft.pdf</a> |
| American Samoa Government Department of Commerce  | American Samoa Statistical Yearbook 2008            | 2011                    | This is a compendia detailing both historical and current economic and social characteristics of the Territory.   | 2006-2008           | <a href="http://www.doc.as/wp-content/uploads/2011/11/Statistical-Yearbook_2008.pdf">http://www.doc.as/wp-content/uploads/2011/11/Statistical-Yearbook_2008.pdf</a>                         |
| Central Intelligence Agency   | The World Factbook Life Expectancy at Birth         | 2013                    | These data represent the average number of years to be lived by a group of people born in the same year, if mortality at each age remains constant in the future.   | 2014                | <a href="https://www.cia.gov/library/publications/the-world-factbook/rankorder/2102rank.html">https://www.cia.gov/library/publications/the-world-factbook/rankorder/2102rank.html</a>       |
| Central Intelligence Agency   | The World Factbook Inflation Rate (Consumer Prices) | 2014                    | Inflation rate (consumer prices) compares the annual percent change in consumer prices with the previous year's consumer prices.  | 2003-2014           | <a href="https://www.cia.gov/library/publications/the-world-factbook/rankorder/2092rank.html">https://www.cia.gov/library/publications/the-world-factbook/rankorder/2092rank.html</a>       |
| Department of Commerce (DOC), National Oceanic and Atmospheric Administration (NOAA), Ocean and Coastal Resource Management | MPA Inventory Database (10/2014)                    | 2014                    | The MPA Inventory is a comprehensive catalog that provides detailed information for existing marine protected areas in the United States. The inventory provides geospatial boundary information (in polygon format) and classification attributes that seek to define the conservation objectives, protection level, governance and related management criteria for all sites in the database. The comprehensive inventory of federal, state and | 2014                | <a href="http://marineprotectedareas.noaa.gov/dataanalysis/mpainventory/">http://marineprotectedareas.noaa.gov/dataanalysis/mpainventory/</a>   |

| <b>Source (originator)</b>  | <b>Data Set Title</b>  | <b>Publication Date</b> | <b>Abstract</b>  | <b>Data Year(s)</b> | <b>URL</b>  |
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| (OCRM), National Marine Protected Areas Center (MPAC)   |  |                         | territorial MPA sites provides governments and stakeholders with access to information to make better decisions about the current and future use of place-based conservation. The information also will be used to inform the development of the national system of marine protected areas as required by Executive Order 13158.   |                     |   |
| Department of Commerce (DOC), National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), Office for Coastal Management (OCM) | Time-Series Data on the Ocean and Great Lakes Economy for Counties, States, and the Nation between 2005 and 2012 (Sector Level) (ENOW) | 2015                    | Economics: National Ocean Watch (ENOW) contains annual time-series data for over 400 coastal counties, 30 coastal states, 8 regions, and the nation, derived from the Bureau of Labor Statistics and the Bureau of Economic Analysis. It describes six economic sectors that depend on the oceans and Great Lakes and measures four economic indicators: Establishments, Employment, Wages, and Gross Domestic Product (GDP).  | 2005-2012           | <a href="http://coast.noaa.gov/dataset/search/dataset/C3722030-943C-4BEE-B063-06715F815891">http://coast.noaa.gov/dataset/search/dataset/C3722030-943C-4BEE-B063-06715F815891</a> |
| Department of Commerce (DOC), National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), Coastal Services Center (CSC)       | Spatial Trends in Coastal Socioeconomics (STICS): Total Economy of Coastal Areas   | 2013                    | These market data provide a comprehensive set of measures of changes in economic activity throughout the coastal regions of the United States. In regard to the sources of data, establishments, employment, and wages are taken from the Quarterly Census of Employment and Wages (QCEW). These data series also is known as the ES-202 data. These data are based on the quarterly reports of nearly all employers in the United States. These reports are filed with each state's employment or labor department, and each state then transmits the data to the Bureau of Labor Statistics (BLS), where the national databases are maintained. The data for the Coastal Economies have been taken from the national databases at BLS (except in the case of Massachusetts). Gross State Product (GSP) data are taken from the Bureau of Economic Analysis (BEA), which develops the estimates of GSP from a number of sources. In regard to "employment," data are reported by employers, not employees, and does not contain any information about age. There is no difference between "employed" and "employment". The source is known as the payroll survey, a survey filed by employers every 3 months showing the number of people employed at each establishment in each of the preceding 3 months. | 1990-2011           | <a href="http://coast.noaa.gov/dataset/info/coastaleconomy">http://coast.noaa.gov/dataset/info/coastaleconomy</a>   |
| Environmental Protection Agency   | EPA Annual Beach Notification Summary Reports -- Closures and Advisories   | 2007, 2011, 2012        | These fact sheets summarize beach monitoring and notification data submitted to EPA for each swimming season. Beach water monitoring is conducted primarily to detect bacteria that indicate the possible presence of disease-causing microbes (pathogens) from sewage or fecal pollution. People swimming in water contaminated with these types of   | 2006, 2010, 2011    | <a href="http://water.epa.gov/type/ocbe/beaches/2011_season.cfm">http://water.epa.gov/type/ocbe/beaches/2011_season.cfm</a>   |

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|  |   |                         | <p>pathogens can contract diseases of the gastrointestinal tract, eyes, ears, skin, and upper respiratory tract. When monitoring results show levels of concern, the state or local government issues a beach advisory or closure notice until further sampling shows that the water quality is meeting the applicable standards.</p> <p>Beach water pollution can occur for a number of reasons including stormwater runoff after heavy rainfall, treatment plant malfunctions, sewer system overflows, and pet and wildlife waste on or near the beach. To help minimize beachgoers' risk of exposure to pathogens in beachwaters, EPA is helping communities build and properly operate sewage treatment plants, working to reduce overflows as much as possible, and working with the U.S. Coast Guard to reduce discharges from boats and larger ships. Under the Beaches Environmental Assessment and Coastal Health (BEACH) Act of 2000, EPA provides annual grants to coastal and Great Lakes states, territories, and eligible tribes to help local authorities monitor their coastal and Great Lakes beaches and notify the public of water quality conditions that may be unsafe for swimming.</p> |                     |   |
| HML Project Team   | Environmental Use and Dependence - HML Project Team Collection                          | 2014                    | <p>This data set is comprised of uses occurring in study areas as well as attendance figures for parks located in the study areas. Park visitation to national, state, and county parks as well as National Wildlife Refuge areas are included in this data set. Use data includes fishing, diving, and boating in the study area. Sources:</p> <p>-American Samoa data sources: U.S. Fish and Wildlife Service, National Park Service, U.S. Department of Homeland Security/U.S. Coast Guard Office of Auxiliary and Boating Safety, Professional Association of Diving Instructors, National Oceanic and Atmospheric Administration.</p>  | 2013                |   |
| Institute for Health Metrics and Evaluation (IHME)   | United States Adult Life Expectancy by County 1987-2007                                 | 2011                    | <p>This is a complete time series for life expectancy from 1987 to 2007 for all US counties, and released as part of IHME research published in <i>Population Health Metrics</i>.</p>   | 2007                | <a href="http://ghdx.healthdata.org/record/united-states-adult-life-expectancy-county-1987-2007">http://ghdx.healthdata.org/record/united-states-adult-life-expectancy-county-1987-2007</a> |
| National Oceanic and Atmospheric Administration (NOAA), Coastal Change Analysis Program (CCAP) | National Oceanic and Atmospheric Administration, Coastal Change Analysis Program (CCAP) | 2012                    | <p>The Coastal Change Analysis Program (C-CAP) produces a nationally standardized database of land cover and land change information for the coastal regions of the U.S. C-CAP products are developed using multiple dates of remotely sensed imagery and consist of raster-based land cover maps for each date of</p>  | 2001-2007 (various) | <a href="http://www.csc.noaa.gov/digitalcoast/data/ccapregional/">http://www.csc.noaa.gov/digitalcoast/data/ccapregional/</a>   |

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|   | Regional Land Cover Data                                   |                         | analysis, as well as a file that highlights what changes have occurred between these dates and where the changes were located. These data highlight the relative effects of different landscape features on water quality, such as increased polluted runoff from impervious surfaces and the mitigating impacts of forests. NOAA produces high resolution C-CAP land cover products, for select geographies. GIS and tabular data was accessed June 2012 and prepared for the project by NOAA Coastal Services Center, Charleston SC.  |                     |   |
| National Oceanic and Atmospheric Administration (NOAA), National Ocean Service, Office of Response and Restoration, Hazardous Materials Response Division, Seattle, Washington, and NOAA's Coral Reef Conservation Program. | American Samoa ESI: HYDRO (Hydrography Lines and Polygons) | 2004                    | This data set contains vector lines and polygons representing coastal hydrography used in the creation of the Environmental Sensitivity Index (ESI) for American Samoa. The HYDRO data layer contains all annotation used in producing the atlas. The annotation features are categorized into three subclasses in order to simplify the mapping and quality control procedures: GEOG or geographic features, SOC or socioeconomic features, and HYDRO or water features. This data set comprises a portion of the ESI for American Samoa. ESI data characterize the marine and coastal environments and wildlife by their sensitivity to spilled oil. The ESI data include information for three main components: shoreline habitats, sensitive biological resources, and human-use resources. | 2001-2002           | <a href="http://archive.orr.noaa.gov/topic_subtopic_entry.php?RECORDER_KEY%28entry_subtopic_topic%29=entry_id_subtopic_id%28entry_subtopic_topic%29=849&amp;subtopic_id%28entry_subtopic_to%29=8&amp;to%28entry_subtopic_to%29=1">http://archive.orr.noaa.gov/topic_subtopic_entry.php?RECORDER_KEY%28entry_subtopic_topic%29=entry_id_subtopic_id%28entry_subtopic_topic%29=849&amp;subtopic_id%28entry_subtopic_to%29=8&amp;to%28entry_subtopic_to%29=1</a> |
| The World Bank  | World Bank – Fish/Mammal species threatened                | 2010, 2011              | The World Bank is a vital source of financial and technical assistance to developing countries around the world. We are not a bank in the ordinary sense but a unique partnership to reduce poverty and support development. The World Bank Group comprises five institutions managed by their member countries. Fish species are based on Froese, R. and Pauly, D. (eds). 2008. Threatened species are the number of species classified by the IUCN as endangered, vulnerable, rare, indeterminate, out of danger, or insufficiently known.<br><br>Mammal species are mammals excluding whales and porpoises. Threatened species are the number of species classified by the IUCN as endangered, vulnerable, rare, indeterminate, out of danger, or insufficiently known.                      | 2010, 2011          | <a href="http://data.worldbank.org/indicator/EN.FSH.THRD.NO">http://data.worldbank.org/indicator/EN.FSH.THRD.NO</a><br><br><a href="http://data.worldbank.org/indicator/EN.MAM.THRD.NO">http://data.worldbank.org/indicator/EN.MAM.THRD.NO</a>  |
| The World Bank  | World Bank - Population, Total                             | 2014                    | The World Bank is a vital source of financial and technical assistance to developing countries around the world. We are not a bank in the ordinary sense but a unique partnership to reduce poverty and support development. The World Bank Group comprises five institutions managed by their  | 2012-2013           | <a href="http://data.worldbank.org/indicator/SP.OP.TOTL">http://data.worldbank.org/indicator/SP.OP.TOTL</a>   |

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|   |   |                         | member countries. Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship-- except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of their country of origin. The values shown are midyear estimates.   |                     |   |
| The World Bank  | World Bank - GDP (current US\$)                               | 2014                    | The World Bank is a vital source of financial and technical assistance to developing countries around the world. We are not a bank in the ordinary sense but a unique partnership to reduce poverty and support development. The World Bank Group comprises five institutions managed by their member countries. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars. Dollar figures for GDP are converted from domestic currencies using single year official exchange rates.   | 2005-2013           | <a href="http://data.worldbank.org/indicator/NY.GDP.MKTP.CD/countries/PR?display=graph">http://data.worldbank.org/indicator/NY.GDP.MKTP.CD/countries/PR?display=graph</a> |
| U.S. Department of Commerce Bureau of Economic Analysis | Gross Domestic Product for American Samoa, 2013               | 2014                    | Estimates of gross domestic product (GDP) for the territory for 2013, in addition to estimates of gross domestic product by industry and compensation by industry for 2012 are presented in this document. These estimates were developed under the Statistical Improvement Program funded by the Office of Insular Affairs (OIA) of the U.S. Department of the Interior. The latest estimates of GDP for 2007 to 2012 are also presented in this release, as well as GDP by industry and compensation by industry for 2007 to 2011.   | 2007-2013           | <a href="http://www.bea.gov/newsreleases/rels.htm">http://www.bea.gov/newsreleases/rels.htm</a>   |
| U.S. Department of Commerce Bureau of Economic Analysis | Advance 2013 and Revised 1997-2012 Statistics of GDP by State | 2014                    | These statistics reflect the results of the comprehensive revision of gross domestic product (GDP) by state for 1997–2012. This revision not only incorporates new and revised source data, but it also includes significant improvements in classification and statistical methods to more accurately portray the state economies. Significant changes introduced with this revision include: updated industry definitions consistent with the 2007 North American Industry Classification System (NAICS), results of the 2013 comprehensive revision of state personal income, results of the 2013 comprehensive revision of the national income and product accounts and the 2014 comprehensive revision of the annual industry accounts, which included the recognition of research and development (R&D) expenditures as capital, the | 1997-2013           | <a href="https://www.bea.gov/newsreleases/regional/gdp_state/gsp_newsrelease.htm">https://www.bea.gov/newsreleases/regional/gdp_state/gsp_newsrelease.htm</a>             |

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|  |   |                         | capitalization of entertainment, literary, and other artistic originals, the expansion of the capitalization of the ownership transfer costs of residential fixed assets, the use of an improved accrual accounting treatment of transactions for defined benefit pension plans, and improved methods for computing financial services provided by commercial banks   |                     |   |
| U.S. Department of Health and Human Services | National Vital Statistics Reports: Deaths: Preliminary Data for 2011  | 2012                    | These are preliminary U.S. data on deaths, death rates, life expectancy, leading causes of death, and infant mortality for 2011 by selected characteristics such as age, sex, race, and Hispanic origin. Preliminary data in this report are based on records of deaths that occurred in calendar year 2011, which were received from state vital statistics offices and processed by the Centers for Disease Control and Prevention's National Center for Health Statistics (NCHS) as of June 12, 2012.  | 2011                | <a href="http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_06.pdf">http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_06.pdf</a>   |
| U.S. Department of Health and Human Services | National Vital Statistics Reports: Deaths: Final Data for 2010  | 2013                    | These data represent final 2010 data on U.S. deaths, death rates, life expectancy, infant mortality, and trends by selected characteristics such as age, sex, Hispanic origin, race, state of residence, and cause of death.  | 2010                | <a href="http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_04.pdf">http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_04.pdf</a>   |
| U.S. Energy Information Administration       | EIA State Electricity Profiles  | 1991-2014               | The State Electricity Profiles presents a summary of key State statistics for 2000, and 2004 through 2010. The tables present summary statistics; ten largest plants by generating capacity; top five entities ranked by retail sales; electric power industry generating capacity by primary energy source; electric power industry generation of electricity by primary energy source; utility delivered fuel prices for coal, petroleum, and natural gas; electric power emissions estimates; retail sales, revenue, and average revenue per kilowatthour by sector; and utility retail sales statistics. Data published in the State Electricity Profiles are compiled from five forms filed annually by electric utilities and other electric power producers. | 1990-2014           | <a href="http://www.eia.gov/electricity/state/">http://www.eia.gov/electricity/state/</a>   |
| U.S. House of Representatives                | Committee on Ways and Means Report: Supplemental Nutrition Assistance Program (Formerly the Food Stamp Program) | 2013                    | This report written by the U.S. House of Representatives Ways and Means Committee details SNAP and some of the figures associated with the program.   | 2007                | <a href="http://democrats.waysandmeans.house.gov/sites/democrats.waysandmeans.house.gov/files/documents/food.pdf">http://democrats.waysandmeans.house.gov/sites/democrats.waysandmeans.house.gov/files/documents/food.pdf</a> |
| United States Census Bureau                  | Census 2000   | 2002                    | Summary File 3 contains population and housing data based on Census 2000 questions asked on the long form of a one-in-six sample  | 2000                | <a href="http://www.census.gov/main/www/cen20">http://www.census.gov/main/www/cen20</a>   |

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|                             |   |                         | of the population. Population items include marital status, disability, educational attainment, occupation, income, ancestry, veteran status, and many other characteristics. Housing items include tenure (whether the unit is owner- or renter-occupied), occupancy status, housing value, mortgage status, price asked, and more. In addition to the 50 states and District of Columbia, the U.S. Census Bureau also conducts censuses and surveys in the the United States' Island Areas. Census and survey operations are conducted in cooperation with the governments of the the Island Areas and frequently include modifications to the questionnaires to help the local and federal governments better understand the populations being counted. |                     | <a href="#">00.html</a>   |
| United States Census Bureau | 2010 Census   | 2011                    | Summary File 1 shows detailed tables on age, sex, households, families, relationship to householder, housing units, detailed race and Hispanic or Latino origin groups, and group quarters.  | 2010                | <a href="http://www.census.gov/2010census/data/">http://www.census.gov/2010census/data/</a>   |
| United States Census Bureau | 2008-2012 ACS 5-Year Estimates  | 2013                    | The ACS provides information on more than 40 topics, including education, language ability, the foreign-born, marital status, migration and many more. Each year the survey randomly samples around 3.5 million addresses and produces statistics that cover 1-year, 3-year, and 5-year periods for geographic areas in the United States and Puerto Rico.   | 2012                | <a href="http://www2.census.gov/acs2012_5yr/summmaryfile/">http://www2.census.gov/acs2012_5yr/summmaryfile/</a>   |
| United States Census Bureau | 2010 Census American Samoa (AS) Summary File  | 2013                    | This summary file contains subject-matter content from the 2010 Census — age (including single years of age), sex, race and ethnicity, household type, relationship, population in group quarters, whether the residence is owned or rented (tenure), and vacancy status among other social, economic, housing, and demographic characteristics.   | 2010                | <a href="https://www.census.gov/2010census/news/press-kits/island-areas/island-areas.html">https://www.census.gov/2010census/news/press-kits/island-areas/island-areas.html</a>   |
| United States Census Bureau | 2013 Population Estimates: Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2013 | 2014                    | The estimates are based on the 2010 Census and reflect changes to the April 1, 2010 population due to the Count Question Resolution program and geographic program revisions. The resident population for each year is estimated since the most recent decennial census by using measures of population change. The resident population includes all people currently residing in the United States.   | 2010-2013           | <a href="http://factfinder.census.gov/faces/tableservices/jsf/page/productview.xhtml?pid=PEP_2013_PEPANNRES&amp;prodType=table">http://factfinder.census.gov/faces/tableservices/jsf/page/productview.xhtml?pid=PEP_2013_PEPANNRES&amp;prodType=table</a> |
| United States Census Bureau | 2009-2013 ACS 5-Year Estimates  | 2014                    | The ACS provides information on more than 40 topics, including education, language ability, the foreign-born, marital status, migration and many more. Each year the survey randomly samples around 3.5 million addresses and produces statistics that cover   | 2013                | <a href="http://www2.census.gov/acs2013_5yr/summmaryfile/">http://www2.census.gov/acs2013_5yr/summmaryfile/</a>   |

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|  |   |                         | 1-year, 3-year, and 5-year periods for geographic areas in the United States and Puerto Rico.  |                     |   |
| United States Census Bureau  | Building Permits Survey   | 2015                    | Data collected include number of buildings, number of housing units, and permit valuation by size of structure. This survey covers all places issuing building permits for privately-owned residential structures. Over 98 percent of all privately-owned residential buildings constructed are in permit-issuing places.  | 2004-2014           | <a href="http://www.census.gov/construction/bps/stateannual.html">http://www.census.gov/construction/bps/stateannual.html</a>                                     |
| United States Census Bureau  | Quarterly Workforce Indicators  | 2015                    | The Quarterly Workforce Indicators (QWI) are a set of economic indicators including employment, job creation, earnings, and other measures of employment flows. The QWI are reported using detailed firm characteristics (geography, industry, age, size) and worker demographics information (sex, age, education, race, ethnicity). QWI data are available through the following access tools:   | 2013-2015           | <a href="http://lehd.census.gov/data/">http://lehd.census.gov/data/</a>   |
| United States Census Bureau  | County Business Patterns  | 2014                    | County Business Patterns (CBP) is an annual series that provides subnational economic data by industry. This series includes the number of establishments, employment during the week of March 12, first quarter payroll, and annual payroll.  | 1998-2012           | <a href="http://www.census.gov/econ/cbp/">http://www.census.gov/econ/cbp/</a>   |
| United States Department of Agriculture Food and Nutrition Service | Supplemental Nutrition Assistance Program: Average Monthly Participation (Persons)  | 2015                    | SNAP offers nutrition assistance to millions of eligible, low-income individuals and families and provides economic benefits to communities. The number of persons participating is reported monthly. Annual averages are the sums divided by twelve.  | 2010-2014           | <a href="http://www.fns.usda.gov/pd/supplemental-nutrition-assistance-program-snap">http://www.fns.usda.gov/pd/supplemental-nutrition-assistance-program-snap</a> |
| United States Government Accountability Office                     | American Samoa and the Commonwealth of the Northern Mariana Islands: Economic Indicators Since Minimum Wage Increases Began | 2014                    | This report updates GAO's previous reports and discusses for each territory (1) changes in employment and earnings and (2) changes in key industries since the most recent federal minimum wage increase and since the increases began. GAO reviewed local and federal earnings information; collected data from employers in key industries through a questionnaire and from employers and workers through discussion groups and interviews during visits to each area. | 2009                | <a href="http://www.gao.gov/assets/670/662127.pdf">http://www.gao.gov/assets/670/662127.pdf</a>   |





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Commerce

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