



Geospatial Information Development and Application in the Federated States of Micronesia

Summary of Stakeholder Kick-off Meeting and Initial Activities

Prepared by University of Hawaii: Pacific Disaster Center, Island Research & Education Initiative, and the College of Micronesia – FSM for the UH Sea Grant College Program, Administrator of the NOAA Coastal Storms Program in the Pacific Islands Region



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Summary of Kick-off Meeting

Project Overview

A stakeholder kick-off meeting for the project entitled “Geospatial Information Development and Application to Support Effective Decision Making in the Federated States of Micronesia” was held Thursday, May 2nd at the National Campus of the College of Micronesia – FSM. The project is funded through the NOAA Sea Grant Coastal Storms Program. The project team consists of Pacific Disaster Center (PDC), the Island Research & Education Initiative (IREI), and the College of Micronesia – FSM (COM-FSM).

The primary goal of the two year project is to help institutions with disaster management (DM) and disaster risk reduction (DRR) responsibilities access and use locally relevant geospatial information. Existing data will be assembled and catalogued, and new data will be developed to fill identified gaps. Positive impacts are expected to be particularly significant for the Outer Islands, for which limited systematically collected spatial data exists. These data assets will be incorporated into a free, web-accessible decision support and information sharing platform. Training will focus on the use of spatial information to support decision making throughout the disaster management cycle, and will familiarize the local DM and DRR community with specific resources through which data will be made available and the applications through which the data can be used.

The project overview slides presented at the kick-off meeting are included as Appendix A.

Meeting Overview

The one day kick-off meeting was intended to familiarize local stakeholders with the project and project partners, help identify local data priorities and applications, and facilitate the initiation of data-sharing agreements and data collection and compilation. The meeting was divided into two segments. After welcoming remarks and introductions, the morning consisted of presentations and demonstrations outlining the project, partner roles and local resources, and information sharing and dissemination mechanisms. An agenda is included as Appendix B. Presentations on IREI resources and activities and on FSM Census related resources are included as Appendices C and D. COM-FSM resources, www.geomicronesia.fm and PDC’s DisasterAWARE platform (see <http://www.pdc.org/solutions/products/disasteraware/>) and Global Hazards Information Network (www.ghin.pdc.org) were discussed without aids or were demonstrated online.

The afternoon sessions were conducted in workshop format. Small groups discussed and reported out on a series of questions related to data applications, requirements and resources. Groups were created in rough alignment with areas of practice in order to facilitate more focused interaction: Disaster Management; Environment; and Development. The question prompts and results are outlined in a subsequent section. In between small group discussions, IREI and PDC representatives presented a preliminary data inventory and data model and solicited initial feedback on organization, format and potential adaptation. The initial inventory is provided as Appendix E.

Eighteen people, including project partner representatives, participated in the meeting. All four states, as well as the national government, were represented. A variety of thematic areas of practice were also represented, ranging from infrastructure to environment and education to emergency management. All

have a role in effectively reducing disaster risk. Representatives of local NGOs and regional organizations were also invited, but could not make it due to scheduling conflicts. Those that expressed initial interest will be included in future communication. A list of active participants and interested parties is included as Appendix F. The list includes affiliation and contact information.

Workshop Results

Following is a synthesis of the group responses to each question prompt. Dominant themes for each session question are discussed. The raw notes are included as Appendix G for reference.

Session 1, Question 1

Think of the decisions you make and the activities your organization is responsible for. How do you currently use geospatial information to execute your mission?

Specific responses reflected the breadth of practice represented in the room. However, four cross-cutting themes emerged during the discussion: monitoring, assessment and analysis, planning and management, and communication. This indicates that participants use, or would like to use, geospatial resources to support a full cycle of activities required to execute their organizational responsibilities. These activities include establishing baselines, performing analyses that provide evidence for decision making, allocating resources and prioritizing action, and communicating with policy makers and the general public. Planning and management was particularly emphasized, which highlights the cross-cutting need for *access* to quality geospatial outputs, regardless of origin. The organizational requirements to produce geospatial data or perform geospatial analysis were somewhat more limited, though the need for geospatial competency was identified as a key theme throughout the workshop sessions.

Discussion of communication focused on facilitating understanding and awareness of specific issues for specific purposes and audiences. However, accessibility also depends on communication. Inter-organizational sharing of geospatial information was not identified as a key activity of any of the organizations except COM-FSM during this session, though the Office of Statistics, Budget and Economic Management, Overseas Development Assistance, and Compact Management (SBOC) illustrated ways in which information was made available for viewing in a previous discussion. Challenges and constraints on information sharing were elaborated upon in a later session.

Session 1, Question 2

What geospatial information and/or resources would help your organization achieve your goals more effectively or more easily?

This discussion focused on identifying “wish list” resources: What do you want that you don’t have? Responses fell mostly into three broad categories: better information sharing; better data; and increased physical, technical, and human resources to support the use and understanding of geospatial information.

Information sharing was primarily brought up by groups that do not have in-house GIS resources, but depend on geospatial information to better execute their functions, such as the Office of Environment and Emergency Management (OEEM). Applications and/or advantages identified by this organization

and others included better emergency management support (especially in the coordination of response), reduced cost, and enhancement of current datasets. A government office devoted to geospatial information management was also brought up within the context of information sharing.

“Better data” can be further broken down into modeling outputs and base data. Predictive information for short term and long term weather and climate conditions was discussed, as were more advanced representation techniques such as 3-D modeling. Desired improvements to base data included finer spatial resolution and more extensive spatial coverage, extending to the outer islands. Specific data collection methods / development formats mentioned include hyperspectral and multispectral imagery, field surveys, Lidar, and aerial photos. DEMs were thought to be out of date. Another identified gap in base data was the appropriate representation and application of place names.

Enhanced hardware and human capacity were identified by multiple groups as “wish list” items. Improved hardware (both mobile and stationary) was linked to more efficient collection, storage, and access. Discussion of human capacity focused on increased technical knowledge and more people to use it and apply it. OEEM emphasized the importance of accessing geospatial information and having personnel who can explain and use it; in-house hardware and software can come later.

Session 1, Question 3

What constraints do you have in accessing, managing, or using geospatial information?

“Wish list” issues identified in the foregoing discussion were reiterated here. The speed and consistency of internet connections was identified as a major constraint in effectively accessing data. Limitations of hardware capacity were also identified as a barrier to storing, managing, serving and analyzing data. In addition, not all organizations have software that supports the management, analysis, and visualization of geospatial data. Lastly, participants pointed to the need for increased human capacity to understand and use both geospatial information and GIS software; while many at the kick-off meeting have a deep knowledge of GIS and geospatial information, the pool is relatively small.

Session 2, Question 1

What geospatial resources can your organization make available to others in FSM and/or beyond? Please describe thematic content, coverage, and format, if possible. If you are primarily a data user, how and from what sources do you access information?

During this session, a number of resources that are currently available at various organizations were specified. This exercise allowed those who needed certain kinds of information to begin to identify those who might have it and make connections. Participants also identified sources of additional geospatial information leveraged by stakeholders, as well as potential sources of additional useful information. The discussion and white-boarding was intended as a beginning, not an end. These initial notes will be systematically augmented through a data inventory questionnaire distributed to the participants (Appendix H). The initial notes on theme, format, and coverage developed in the workshop are included in the inventory questionnaire as a starting point. So are the suggested sources. During this session, participants mentioned a previous inventory that was funded and performed in 2005¹, but was never

¹ Sweet, S.D. 2006. *Geographic Information Science (GIS) Status Report for the Federated States of Micronesia: A Conservation Perspective*. Kolonia, Pohnpei: The Nature Conservancy.

used as a basis for improving data quality and availability in FSM. A copy was recently provided by one of the participants and will be reviewed and used to locate additional data sources and compare constraints and gaps.

Specific geospatial datasets and suggested information sources are included in Appendix G. These datasets meet some of the requirements discussed in Session 1. SBOC has a wealth of information, including demographic and livelihood information for the outer islands. Some infrastructure data is also available for the outer islands. Fine resolution base data also exists. However, spatial coverage appears to be disjointed, and attribute data is limited. The data inventory questionnaire will help to better characterize gaps and match requirements to resources.

Session 2, Question 2

What specific challenges do you see to sharing information?

Participants identified three main sets of challenges to information sharing: institutional barriers, interoperability issues, and coordination/communication barriers. Some potential means of overcoming these challenges were also discussed by participants.

Institutional barriers were of three types: challenges posed by the lack of copyright laws and institutional protections; organizational protectionism; and sensitivity of information. Lack of institutional protections like copyright laws can make individuals and organizations less willing to share data. Before information is officially published, people ask for it. Information has been misused in the past, but there is no perceived recourse. One suggestion was not to release information until it is “officially” published. In this project, all sources will be clearly cited and include use constraints. Formal data sharing agreements can codify terms. It was also noted that information can be a source of power and can ensure organizational or individual relevance. This is a more difficult barrier to overcome, though ensuring full credit and incentivizing sharing by giving something in return can mitigate impacts. Sensitivity of government or corporate property is an ongoing challenge, as businesses wish to protect assets and governments must by law protect individual identities captured during data collection efforts. If specifying attributes are removed and/or information is aggregated, data sharing becomes more feasible.

Interoperability barriers can be technical or can stem from lack of information about the origin of the data. The institutional barriers cited above also contribute to a lack of interoperability. Specific technical challenges identified include not being able to open files, and incompatible software or file formats. The project implementation partners will be processing data to support multiple means of access and common formats. Comprehensive metadata can help prevent interoperability issues stemming from lack of information on data accuracy, reliability, and appropriateness for the intended application.

Coordination and communication could also be considered a means of facilitating interoperability. Specific challenges cited by participants included inadequate feedback loops and tracking mechanisms, passing of data through multiple hands with no records, and limited publicity and awareness of available data and resources. Metadata can help identify processing history, but does not help solve challenges associated with data enhancements and updates that are made in isolation and not noted or shared. The kick-off meeting was a first step in publicizing resources and those efforts will continue throughout

the project. It is hoped that relationships and processes established over the course of the project will facilitate information sharing beyond the final workshops.

Next Steps

This project has components related to data development, information sharing, and capacity enhancement, three overarching themes identified during workshop sessions. Results reinforced the project's relevance and helped identify new leads and applications. The kick-off meeting as a whole helped stakeholders and implementing partners get to know one another and set the stage for future collaboration.

Following the kick-off meeting, the data inventory questionnaire was sent to participants, requesting information on data themes, ownership, and spatial and temporal coverage (Appendix H). The questionnaire will enable implementing partners to more systematically compile information on what data are available, what data are releasable and any constraints on use or release (these matters will be addressed more fully during the data collection and documentation process). Danko Taborosi of IREI will be following up with meeting participants and suggested contacts in Chuuk from May 13th to the 23rd. He will then travel to Yap the last week of May. During these visits, he will help data owners complete the data inventory questionnaire and obtain what data has been approved for sharing and can be easily transferred. Taborosi and Snyder Biza of COM-FSM will have ongoing contact with stakeholders on Pohnpei. Lara Payne of PDC will be travelling to Pohnpei and Yap from the 8th to the 17th of July for data collection and meetings with stakeholders. An initial project trip to Kosrae has yet to be scheduled, but is anticipated to be complete by October.

Over the next month, the inventory questionnaire results will be compiled and prioritized. Suggested source organizations not at the kick-off meeting will be contacted by phone to introduce the project, with a follow-up request to complete the inventory questionnaire. Project partners will refine the data model and prepare for an initial release of updated data in July. The project team will continue to develop and attribute data in cooperation with stakeholders in preparation for a second release of newly developed data in December. Data collected or developed at the state or island level will be merged into FSM-wide datasets using a common projection for management, storage and project level dissemination. More specific geographies can be extracted as needed.

Acknowledgments

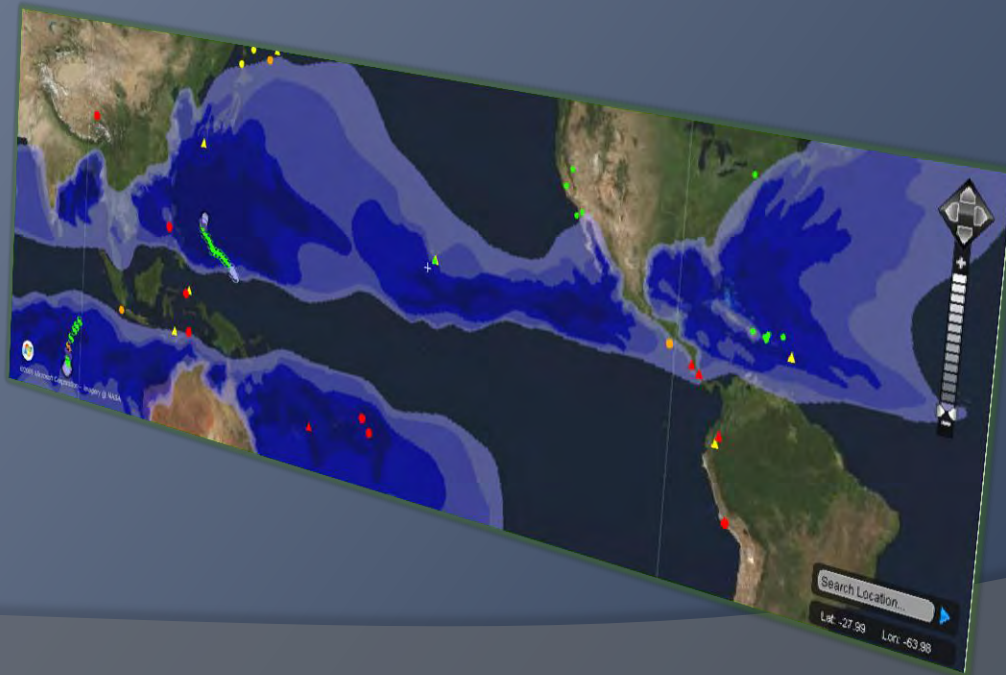
We would like to extend a special thanks to the College of Micronesia - FSM for their gracious hospitality in hosting the kick-off meeting. Kalahngan.

Appendix A: Project Overview Presentation



GEOSPATIAL INFORMATION DEVELOPMENT AND APPLICATION IN THE FEDERATED STATES OF MICRONESIA

Project Overview



May 2, 2013

College of Micronesia, National Campus

Pohnpei, FSM

Goal

- Enhance the capacity of those supporting DM and DRR activities in FSM to access and use locally relevant geospatial information.



Objectives

- ① Develop and publish a comprehensive, locally relevant, and accurate set of geospatial data to support DM and DRR activities for all of FSM.
- ① Incorporate geospatial resources into a free, web-accessible decision support system.
- ① Enhance local capacity to use data resources and decision support tools through training.
- ① Enhance awareness and promote broad usage of the resources.



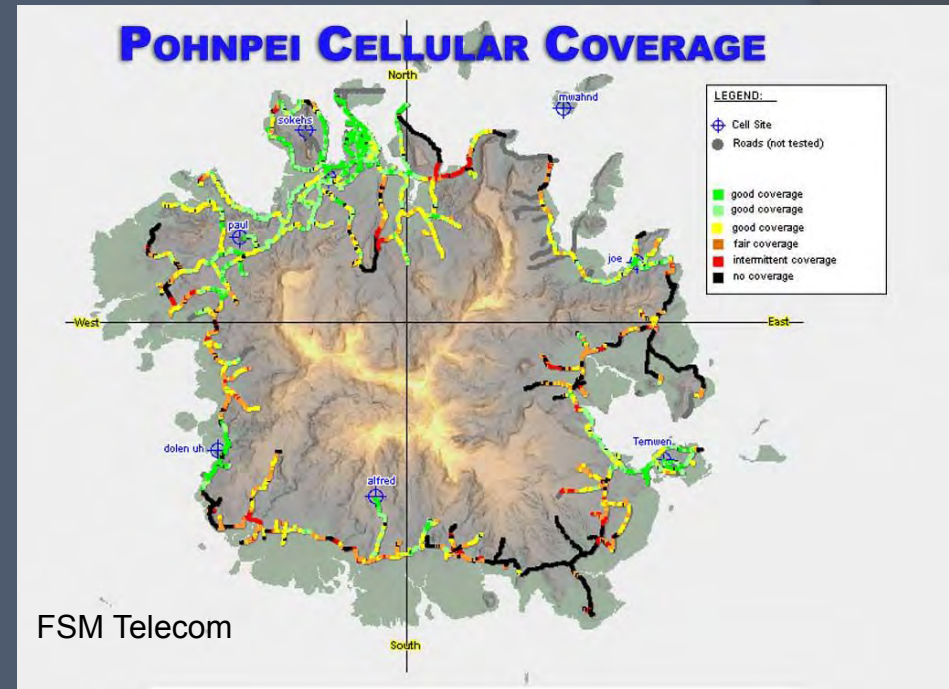
Project Activities

- Inventory and Compilation of Existing Data
- Development and Compilation of New Data
- Data Integration into Data Sharing and DSS Platforms
- Training on Spatial Data for DM Decision Making
- Local Outreach Workshop
- Regional Promotion
- Monitoring and Evaluation



Inventory and Compilation of Existing Data

- Kick-off Meeting
- Data Collection
- Data Inventory
- Data Collection Plan to Fill Gaps



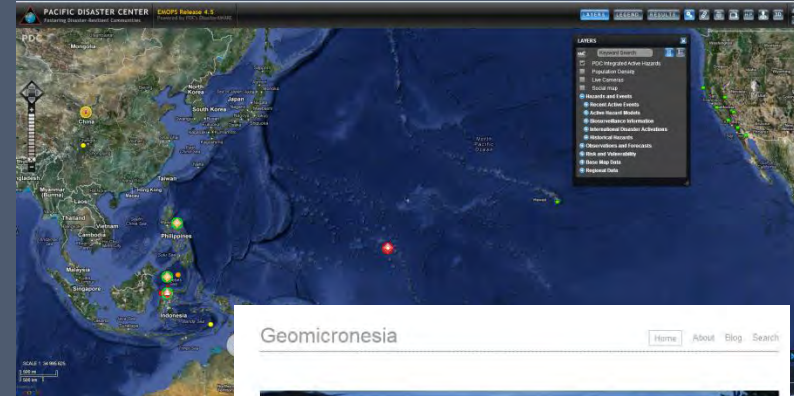
Development and Compilation of New Data

- Focus on the Outer Islands
- Digitization of Features from Georeferenced Imagery
- Attribution, Verification and Enhancement through Interviews with Residents



Integration into Data Sharing and Decision Support Platforms

- Data Processing
- Metadata
- Data Sharing Mechanisms
 - geomicronesia.fm
 - Global Hazards Information Network
- Decision Support Platform
 - DisasterAWARE
- Back-up Copies
- Ongoing Updates



Geomicronesia

Geomicronesia

Geomicronesia is a spatial data repository representing the collaborative efforts of FSM and US partners. Our goal is to become a one-stop shop for spatial data for the FSM. Over the coming months after our initial public launch on June 22, 2011 (Palmeja time), we will add functionality and update the site to include the following:

- synchronize data mirrors between the Palmeja installation (hosted at the [Conservation Society of Palmeja](#)), The Department of Geography at The University of Iowa, and the University of Nevada Las Vegas
- make the collected spatial data easy to obtain through Geonetwork, anonymous FTP, and spatial services (WMS, WCS, WFS, Google Earth KML)
- provide methods for interested parties to add their spatial data to the repository
- encourage a lively discussion for spatial data standards for the FSM.

The Geonetwork servers can be reached from the following links - if a server is unavailable, please try the mirror.

[Palmeja - FSM - Conservation Society of Palmeja](#)
[Cloud-based Mirror](#) **Note:** The mirror housed at The University of Iowa, Department of Geography has been moved to the cloud. We are using Microsoft Azure to host this service

Looking for FSM spatial data?

We use the open-source [Geonetwork](#) software to host our spatial data repository. Due to some issues with Internet Explorer, we suggest that you use Firefox, Chrome or Safari web browsers to access Geonetwork.

Click on the following links to access our Geonetwork servers:

GEONETWORK mirror:
[Palmeja - FSM](#)
[Cloud-based mirror](#)

If a server is not available, please try the other mirror.



“Spatial Data for Disaster Management Decision Making” Training/Workshop

- Focused on those with DM or DRR Responsibilities
- Opportunity to Interact Directly with the Data
- Activities to Familiarize participants with Application of the Data for DM Activities
- Training on the Use of Project Tools for Awareness, Info Sharing, and Decision Making



Local Outreach Workshop

- Less Technical
- Target Entities that Do Not Use, but Could Benefit from Geospatial Information
- Familiarize with Project and Project Resources
- Familiarize with Basics of GIS
- Brainstorm on Applications



Regional Outreach

- Web Stories and Press Releases
- Newsletters
- “Fact Sheets”
- Select Workshop Materials Made Available through Website
- Publicize and Share Information through Regular Activities and Interactions
- Identify Specific Opportunities to Publicize and Share



Monitoring and Evaluation

- Updates on Progress and Milestones
- Post Workshop Surveys



Anticipated Outcomes

- First Systematically Collected, Locally Verified Data Sets for the Outer Islands
- Increased Access to Relevant Geospatial Resources
- Greater Familiarity with the Application of Spatial Data for DM and DRR Decision Making
- Greater Awareness of GIS
- Enhanced Effectiveness of Range of Activities



Timeline

- ~2 Year Project
- May 2013: Kick-off Meeting
- Early July 2013: First Data Release
- December 2013: Second Data Release
- September 2014: Final Data Release
- October 2014: Workshops
- December 2014: Final report and Project Close

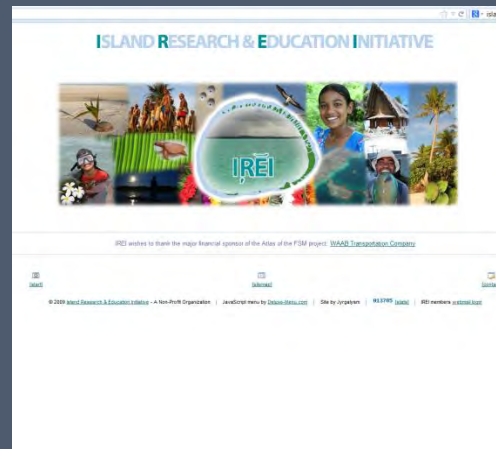


Funding Mechanism

- ◎ Pacific Islands Coastal Storms Program
 - Part of Larger effort led by NOAA
 - Hosted by University of Hawaii Sea Grant College Program
 - Goal is to reduce the impact of coastal hazards to Pacific Island communities, ecosystems and economies

Implementing Partners

- Pacific Disaster Center
- Island Research & Education Initiative
- College of Micronesia - FSM



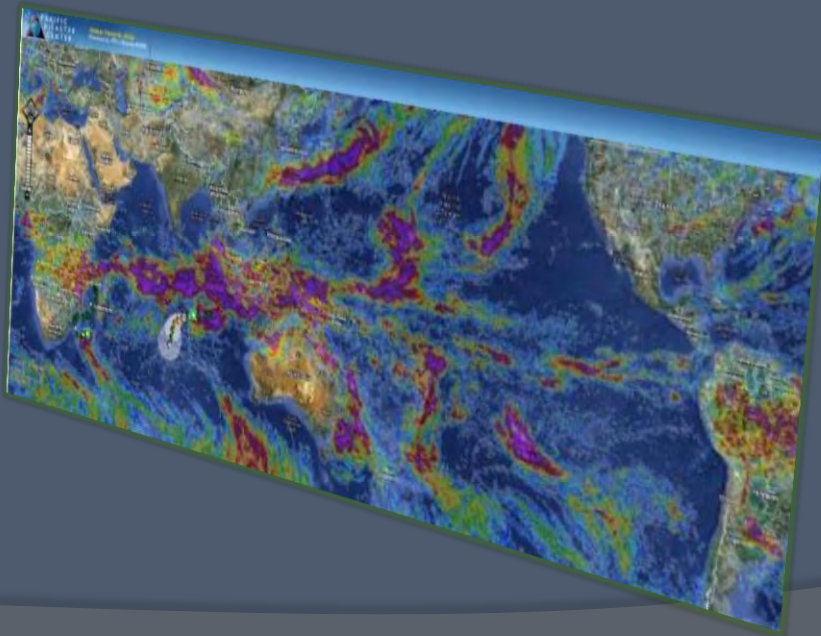


Questions?

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Appendix B: Agenda



Kick-Off Meeting: Geospatial Information Development and Application in the Federated States of Micronesia

May 2, 2013

College of Micronesia – FSM, Pohnpei, FSM

Morning	
8:45 am – 9:00 am	Arrival
9:00 am – 9:10 am	Welcome and Workshop Overview <i>Jennifer Hainrick, Director of the Learning Resources Center and Acting Vice President for Instructional Affairs, College of Micronesia (COM-FSM)</i> <i>Heather Bell, Pacific Disaster Center (PDC)</i>
9:10 am – 9:30 am	Introductions <i>All Participants</i>
9:30 am – 10:00 am	Project Overview <i>Heather Bell</i>
10:00 am – 10:30 am	Partner Overviews <i>Heather Bell</i> <i>Danko Taborosi, Island Research & Education Initiative (IREI)</i> <i>Snyther Bizza, COM-FSM</i>
10:30 am – 10:45 am	Break
10:45 am – 10:55 am	Introduction to FSM Census Data and other Office of Statistics Resources <i>Arnold Canete, Office of Statistics, Budget and Economic Management, Overseas Development Assistance, and Compact Management</i>
10:55 am – 11:05 am	Introduction to COM-FSM GIS Resources <i>Snyther Bizza</i>
11:05 am – 11:15 am	Introduction to IREI Information Resources and geomicronesia.fm <i>Danko Taborosi</i>
11:15 am – 11:25 am	Introduction to geomicronesia.fm <i>Joyce Anson, FSM Telecom (stepping in for Conservation Society of Pohnpei based on involvement)</i>
11:25 am – 11:45 am	Intro to DisasterAWARE and the Global Hazards Information Network <i>Lara Payne, PDC</i>
11:45 pm – 12:00 pm	Information Sharing (Institutional and Technical Requirements) <i>Lara Payne</i>

Afternoon

12:00 pm – 1:30 pm	Lunch
1:30 pm– 2:45 pm	Data Needs and Applications Discussion <i>All Participants, facilitated by PDC, IREI and COM-FSM</i>
2:45 pm – 3:00 pm	Current Inventory <i>Lara Payne</i> <i>Maria Kottermair, IREI</i>
3:00 pm – 3:15 pm	Break
3:15 pm – 4:30 pm	Data Resources Discussion and Mapping <i>All Participants, facilitated by PDC, IREI and COM-FSM</i>
4:30 pm – 5:00 pm	Wrap-up and Next Steps

Appendix C: IREI Resources Presentation

Island Research & Education Initiative



GIS information resources at IREI

**Kick-Off Meeting: Geospatial Information Development
and Application in the Federated States of Micronesia**

COM National Campus, FSM, May 2, 2013

Geospatial Data for the Outer Islands

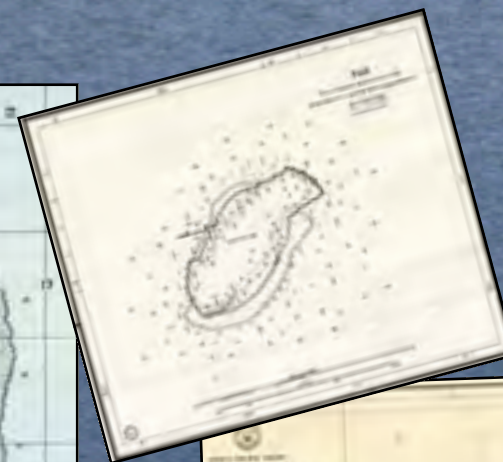
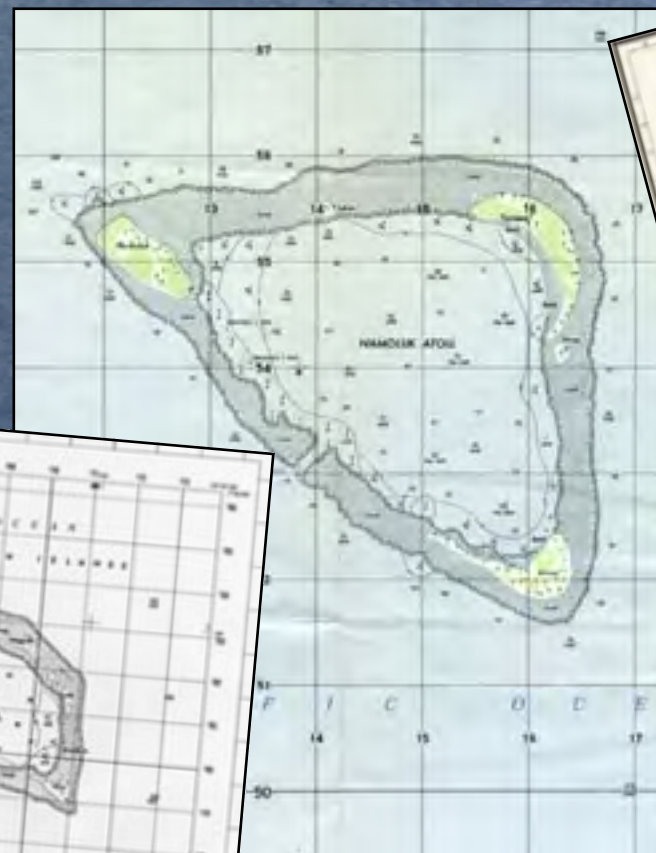
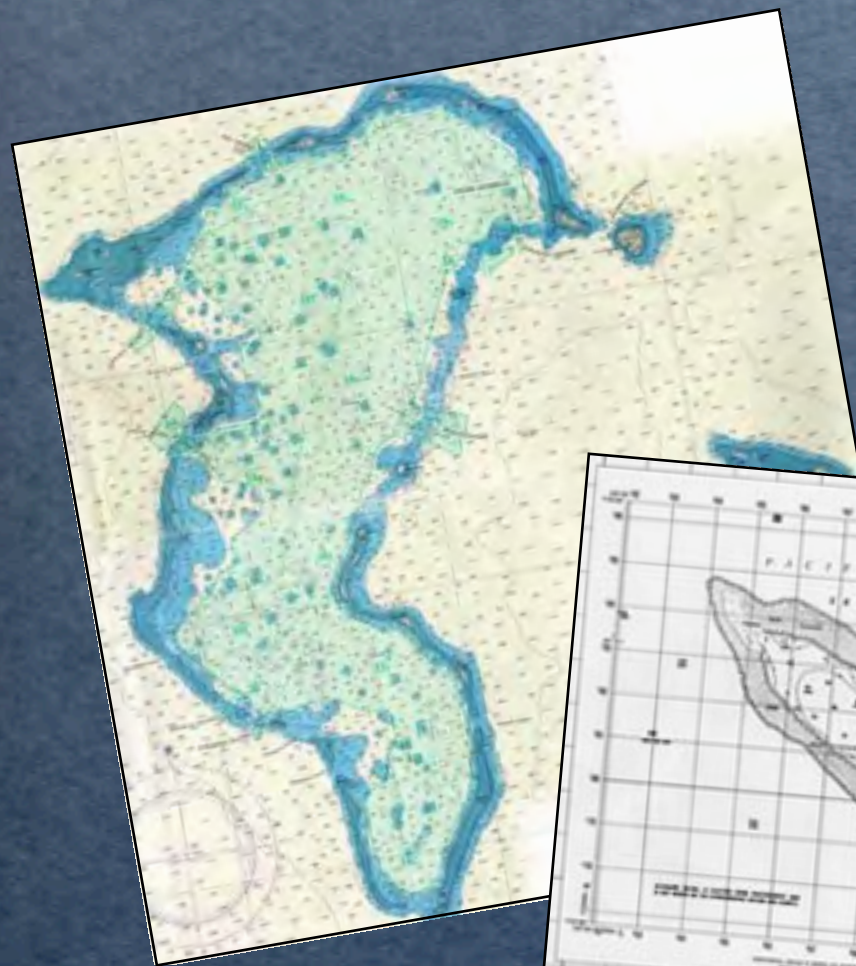
Outer Islands are some of the most geographically dynamic and environmentally sensitive places in Micronesia, yet remain poorly documented in geospatial terms.



1. Collection of Historical Maps

Inventory and procurement of paper maps of FSM's Outer Islands

For the low islands in Micronesia, the United States Geological Survey never created topographic maps analogous to those of the main islands. Some maps were created by the US Army and Navy, particularly in the years following WWII and were often based on earlier maps from the Japanese period. Those maps are difficult to obtain and lack detail. Precise GIS data is not available at all.



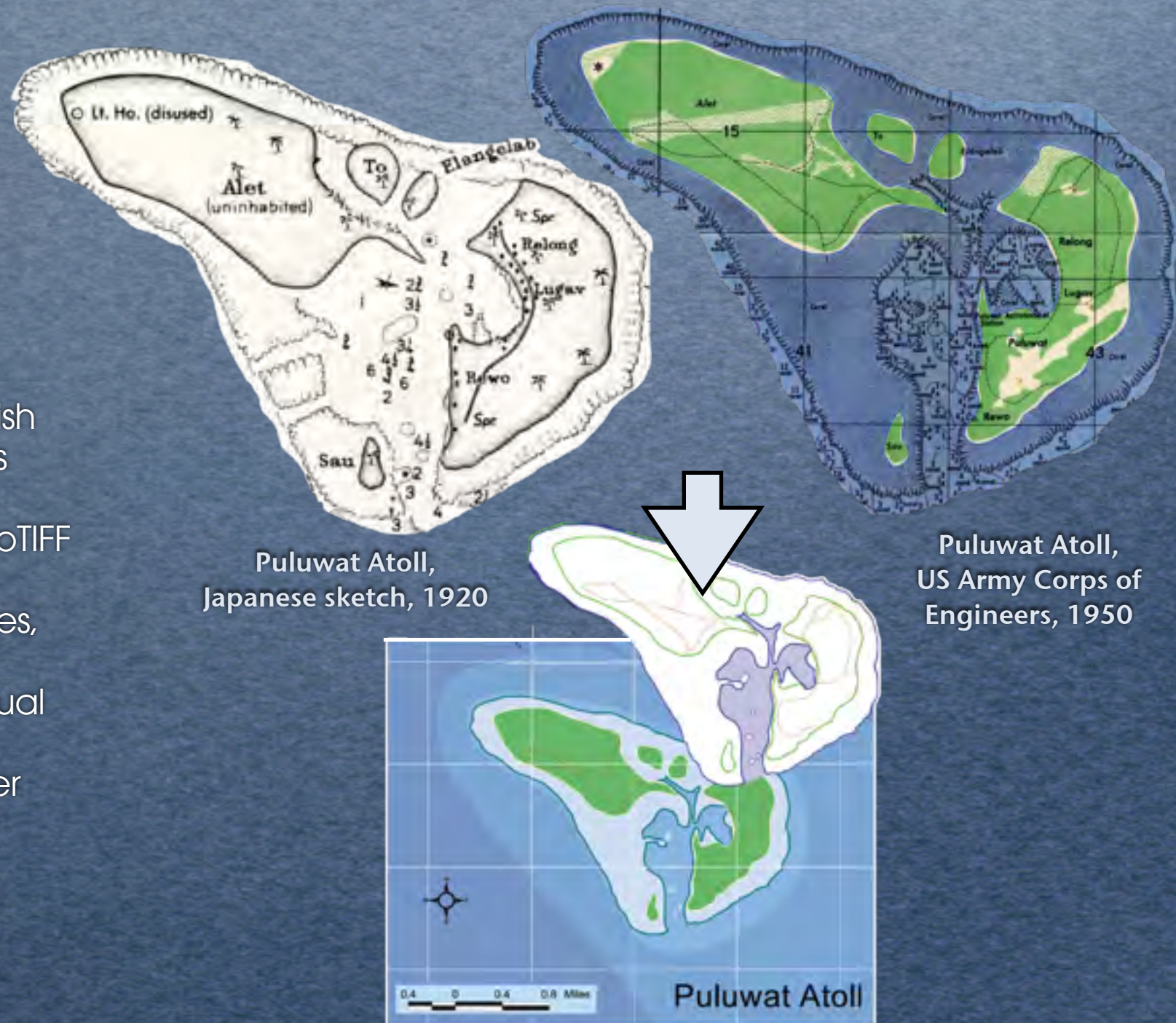
Examples of historic maps of FSM's Outer Islands

2. Digitized Historical Maps

Scanning, georeferencing and digitizing extant maps

IREI has created GIS datasets based on historical published maps of the Outer Islands using the following approach:

- acquired all known US Army Corps of Engineers topographic maps and British Admiralty, US Navy, and NOAA charts
- scanned paper maps and georeferenced them as JPG and GeoTIFF images
- digitized key features such as shorelines, reefs, paths, vegetation outlines, settlement locations, etc. (all by manual tracing)
- achieved 100% GIS coverage of Outer Islands as rasters and vector data as available from historical sources



3. Digitized Imagery

Manual processing of hi-res imagery



Sorol Atoll,
digitized from QB-2

As part of the current project, we now aim to create a second comprehensive GIS dataset for the Outer Island based on up-to-date high-resolution imagery:

- acquired DigitalGlobe QB-2 orthoimagery
- currently digitizing at large scale a wide range of features, including reefs by type and depth, vegetation by type, non-vegetated areas, man-made structures including house footprints, etc.
- completed 5 atolls thus far, plan to complete all 39 over the course of this project

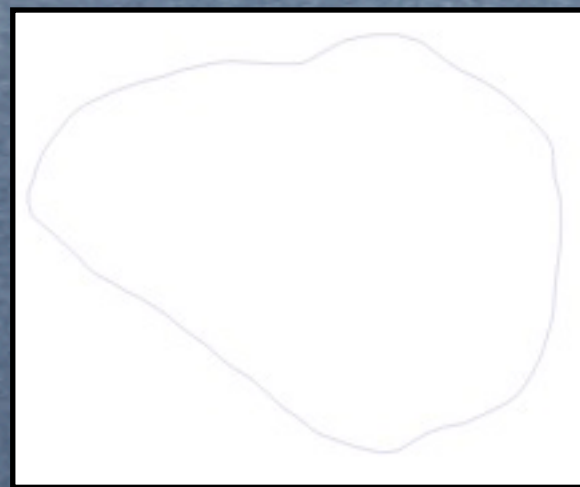
4. Data Comparisons

Highly varying levels of detail among different available datasets

Kapingamarangi Atoll



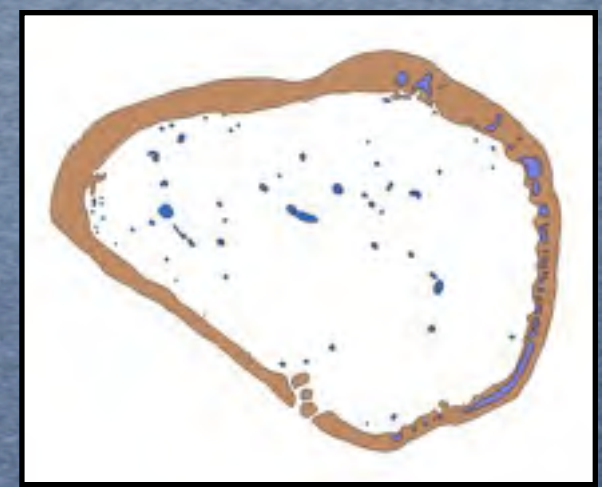
Australian Bureau of Statistics



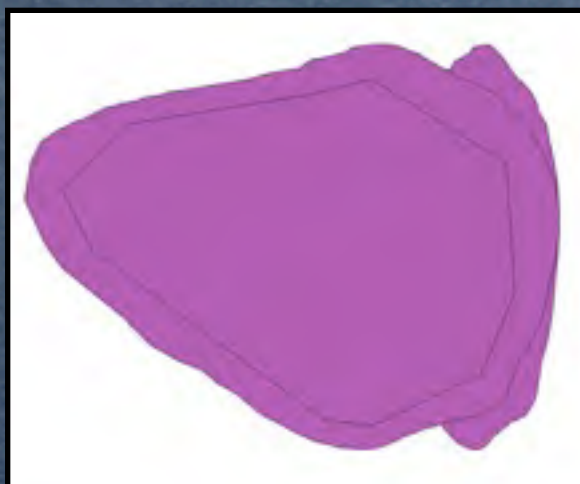
FSM Baselines, unknown source



Millenium Reefs, NASA



Digitized from paper maps, IREI 2008



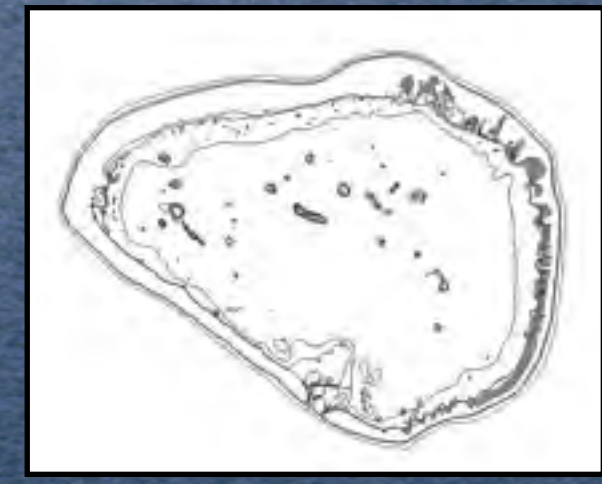
FSM islands, unknown source



Pacific Basin Islands Dataset, NOAA



FSM Base Map, ESRI

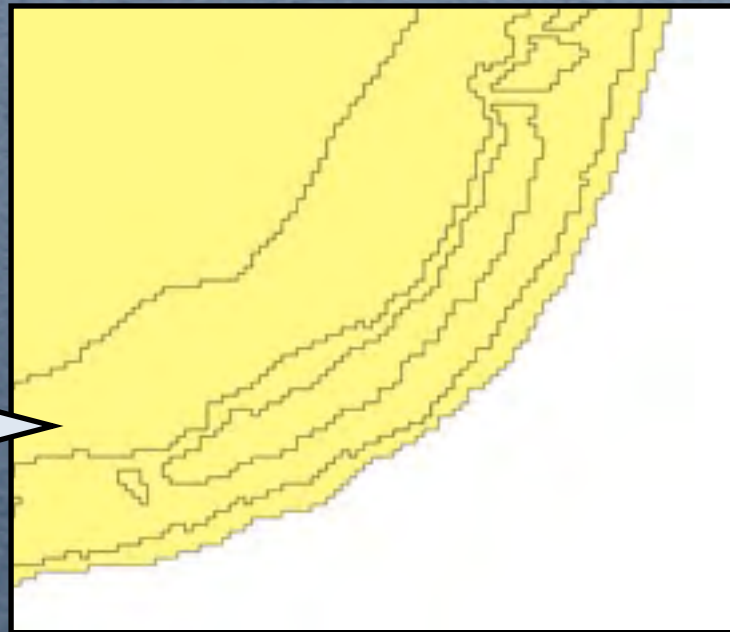
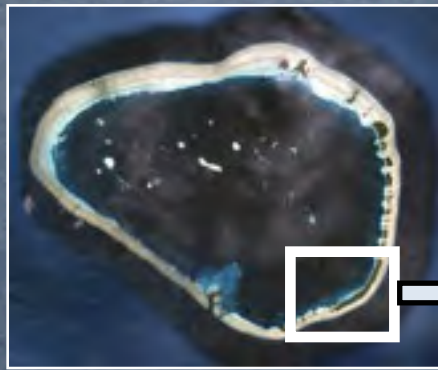


Digitized from imagery, IREI 2013

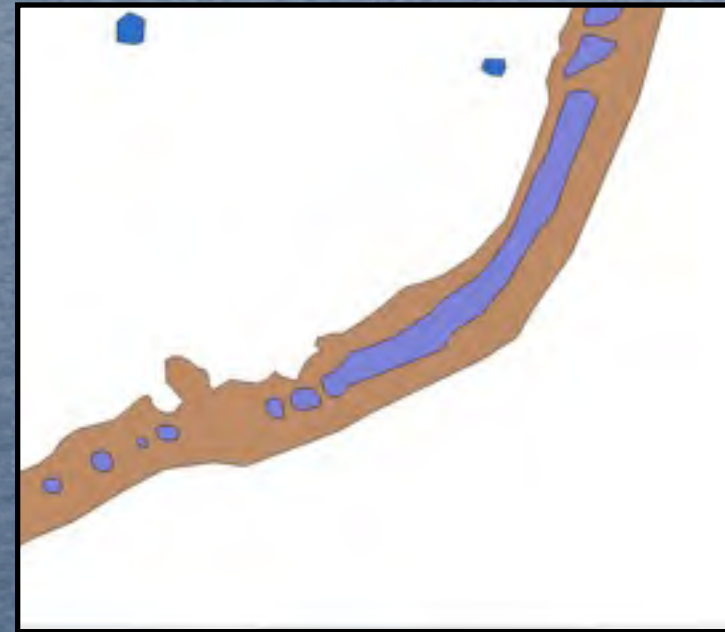
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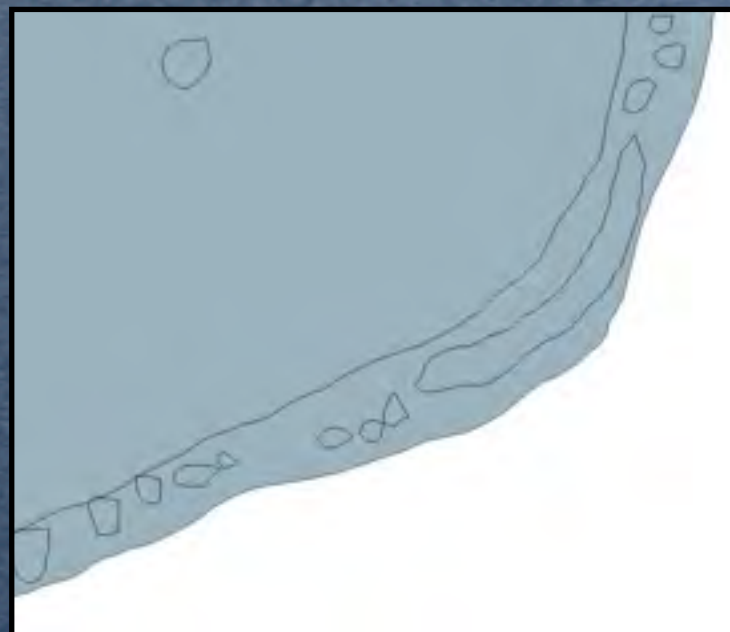
Kapingamarangi Atoll



Millenium Reefs, NASA



Digitized from paper maps, IREI



FSM Base Map, ESRI



Digitized from imagery, IREI

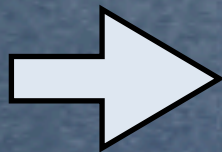


5. Collection of Place Names

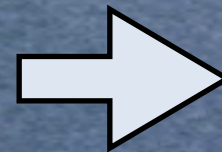
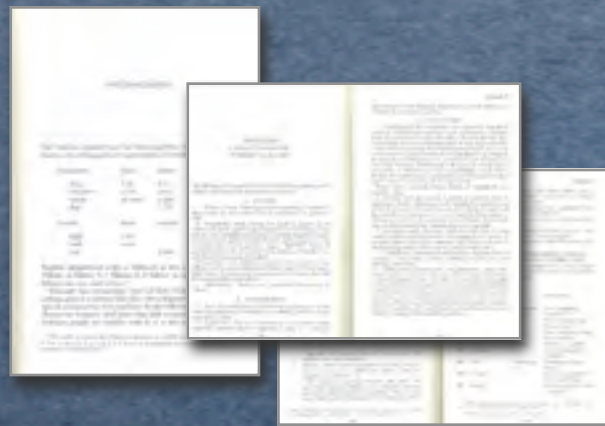
Audio recording, transcription, and documentation of traditional toponyms

Toponyms (place names) are widely recognized as some of the most important repositories of ancient cultural heritage, hidden oral histories, and evidence of indigenous peoples' intimate connection to their lands. Due to colonial history of Micronesia, place names are often mistaken, misapplied, misspelled, or have simply remained unrecorded (especially on small scales).

Audio recording



Orthographic transcription



GIS



Kapingamarangi Atoll

IREI plans a comprehensive effort to document Outer Island place names:

- place names are audio recorded in interviews with local leaders and elders
- transcription is carried out in collaboration with linguists and local language arts specialists
- place names are written to conform to standard orthography (spelling system) of the particular language
- aim is to add locally relevant and linguistically correct place names to future GIS datasets for Outer Islands

6. Geotagged Photography

Ground-level images linked to locality information

Geotagging is a concept in which geographic coordinates are recorded with photographic information. Using a camera synchronized with a GPS logger device, latitude and longitude data can be embedded in each individual image. This method adds a geospatial dimension to photodocumentation work, and allows a vast array of unique applications.

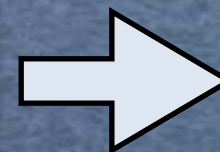
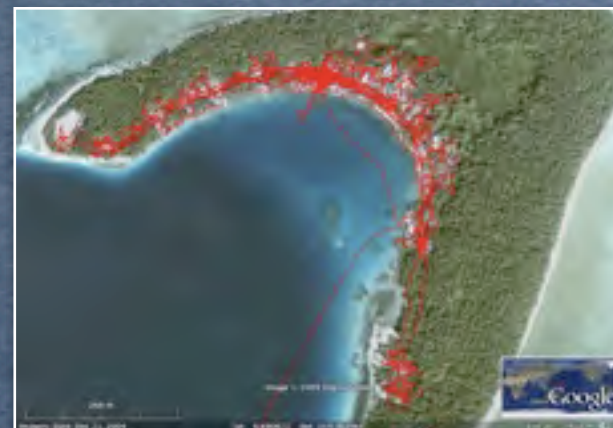


Example: Mwoakilloa Atoll

Digital photographs



GPS logger track data



Geotagged images browsable in Google Earth™

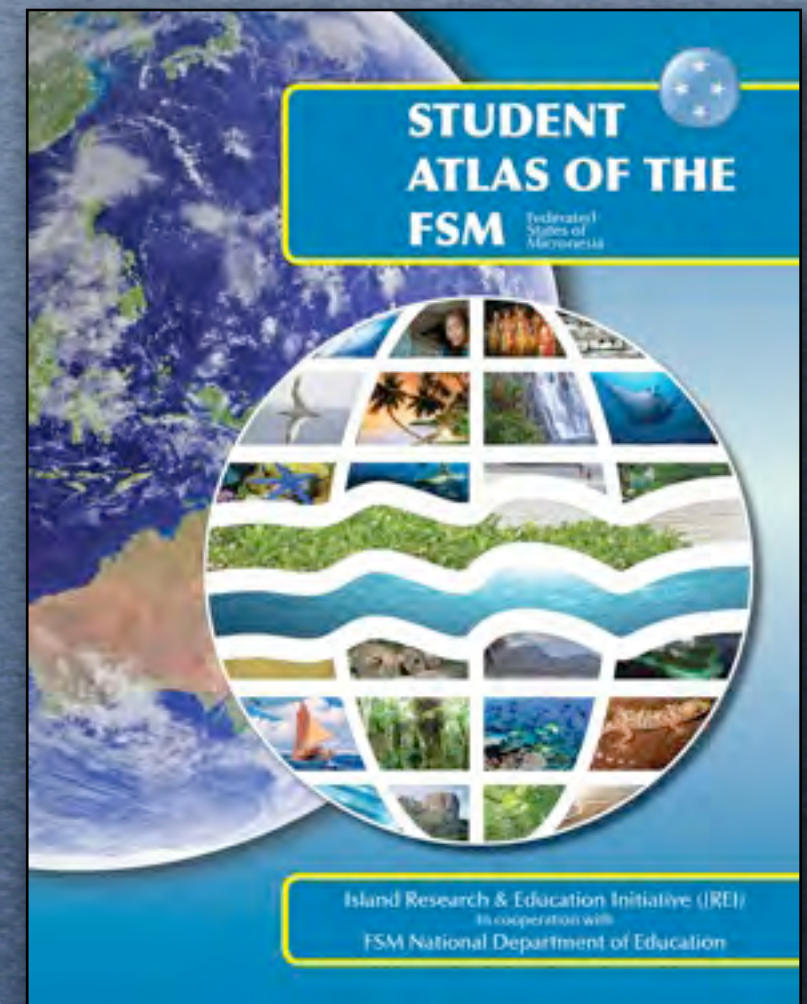


This is an on-going informal imagery-collection program:

- we routinely photograph Micronesia's natural features, scenery, structures, people, cultural aspects
- whenever possible, camera is coupled with a GPS logger device which records location of each image
- images are geotagged using specialized software which embeds coordinates within JPG/TIFF files

7. Geographic Education

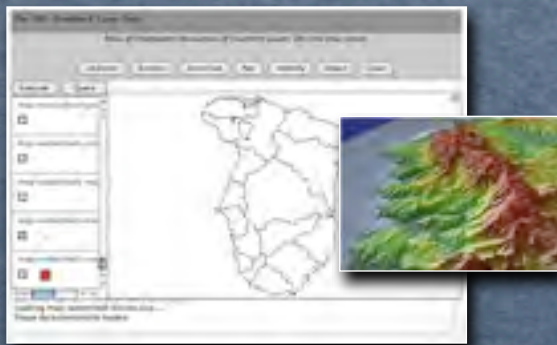
Developing resources to teach local and regional geography of Micronesia



8. GIS-related Projects Outside of the FSM

Web-based data servers, published materials, and ongoing work

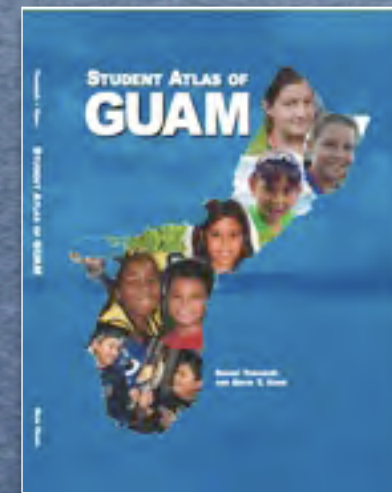
IREI is based in Pohnpei but works on projects throughout the Micronesian region. In Guam, in particular, we have several completed and ongoing projects utilizing GIS data and technology. These include two completed web-based products, two published books, and three other publications in progress.



Digital Atlas of Southern
Guam Natural Resources
* www.hydroguam.net *



Atlas of Guam Environments
* published in 2013 *



Student Atlas of Guam textbook
* published in 2007 *



Guam Street Finder
* in progress *



Coastal Guam Aerial Imagery Database
* www.weriguam.org/v2/interface *



Protected Areas of Guam map
* not yet unpublished *



Guam Classroom Map
* not yet unpublished *

Kalahngan.



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Appendix D: FSM Census and SBOC Resources Presentation

GIS Applied in Statistics



Office of SBOC



Table of Contents



- Current Uses of GIS and Spatial Information
- Plan Use and Future Development
- Resources Currently Available
- Inventory
- Challenges
- Sample maps

Current Uses of GIS and Spatial Information

A close-up photograph of a hand holding a small, translucent globe of the Earth. The hand is positioned on the right side of the frame, with fingers gently gripping the globe. The globe shows the continents in a light color against a darker blue background representing the oceans. The lighting is soft, highlighting the texture of the hand and the smooth surface of the globe.

- Publication maps for enumeration areas in all FSM states for census and surveys;
- Spatial presentation of census results;
- Visual representation of statistical information;
- Enable users to create their own maps via web;
- Improve statistical analysis;
- Improve understanding and use of statistical indicators/outputs.

Plan Use and Future Development



- Integration of geospatial statistical data to enable greater value and use of statistics;
- Continue to collect spatial data in other areas;
- Continue to update the location of households;
- Linking of GPS locations of households to census data;
- Continue to present more information to the public using maps;

Plan Use and Future Development (continued)

A close-up photograph of a hand holding a small, translucent globe of the Earth. The hand is positioned in the upper right corner of the slide, with fingers gently gripping the globe. The globe shows the continents in a light blue color against a darker blue background representing the oceans. The lighting is soft, highlighting the texture of the hand and the reflective surface of the globe.

- Installation of a map server that hosts a geodatabase made available to web users;
- Communicate statistical information to policy and decision makers as well as the general public;
- Avail census and survey results to government agencies and users for planning purposes;
- Assist other agencies in effective monitoring, for instance, health agencies to be able to monitor spread of diseases geographically;

Resources Currently Available



- ArcGIS software
- RETADAM software and database
- PopGIS software
- High Resolution Satellite Imagery of all islands in the FSM
- Some DEM of the main islands in the FSM;

Resources Currently Available (continued)



- GPS location of all households in the FSM
- Maritime Boundaries of the FSM;
- Staff with some knowledge in the use of GIS

Inventory



- All data listed above are in WGS84
- Census Data – limited to GPS location of households and linking to census data is ongoing
- Database on household characteristics in outer islands are linked to map spots

Challenges

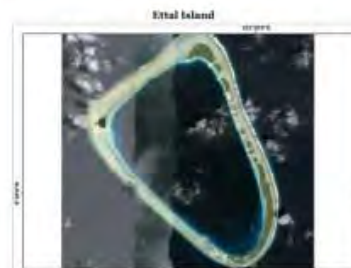
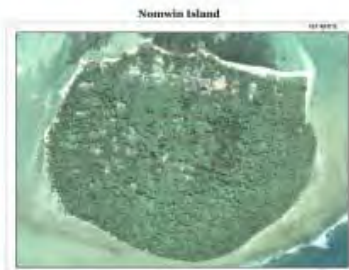


- Shift in DEM files limits advanced geo-spatial presentation and usage
- Projection of some hi-res maps are not accurate
- Limited hardware
- Capacity building

Samples



Map of Chuuk Outer Islands



Geographic Coordinate System: Map Datum: WGS84
Projection: Universal Transverse Mercator Zone 57 North
00 30 75 1.5 2.25 3
Miles
Scale: 1:100,000 1 inch = 0.60 miles

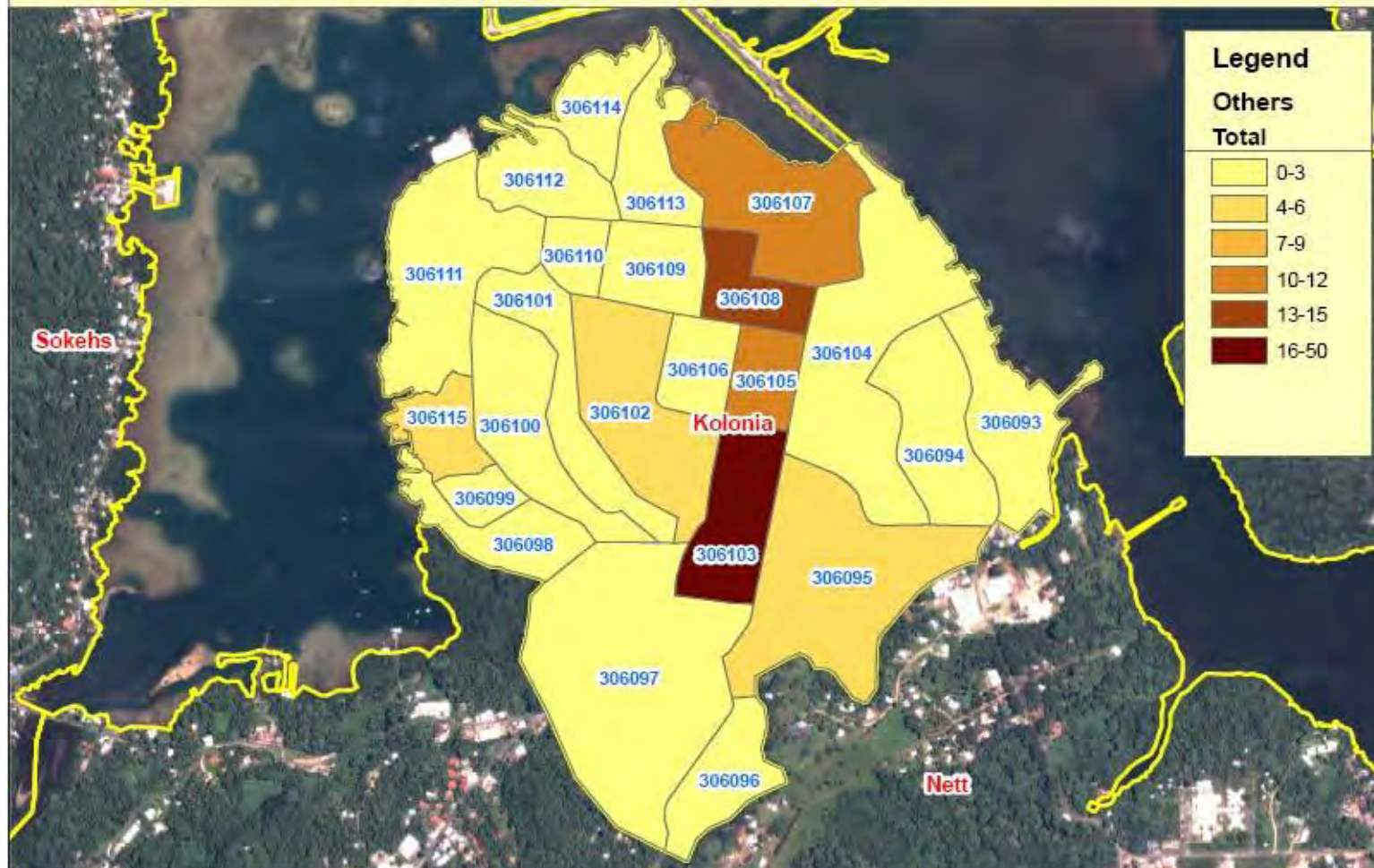
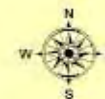


Samples



Other Disabilities Report - Kolonia

FSM 2010 Census of Population and Housing



Samples



FSM HIES 2013 Enumeration Area Map 301002-3

303034	Nett
303043	Nett
305081	Kitti
305085	Kitti
305088	Kitti
305090	Kitti

	Airstrips
	Schools
	Health Facilities
	Populated area
	Rivers/Streams
	Roads
	Selected ED



Please indicate in the map where the actual house is located, if necessary



Samples



fsm.stats Online Statistical Information System
Office of SBDC, FSM National Government

Home Census 2010 Statistics Publications

Housing Characteristics

Basic Cross Tab Area List Averages Medians Thematic Map

Housing Thematic Mapping

Parameter Definition

Table Title:

Variables to include:

- (none)
- Type of living quarter
- Type of walls
- Type of roof
- Type of floor
- Number of rooms
- Year housing unit is completed
- MAIN source of drinking water
- MAIN Washing water
- Bathub or shower connected to piped running water

Output Level: Enumeration District

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fsm.stats Online Statistical Information System
Office of SBDC, FSM National Government

Home Census 2010 Statistics Publications

Housing Thematic Mapping

Type of walls

FSM 2010 Census Thematic Map - KOSRAE

Type of walls

Legend

Concrete

- 13 - 20
- 20 - 24
- 27 - 31
- 33 - 42
- 43 - 57

Municipality

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www.fsmstats.fm

GIS Applied in Statistics



Office of SBOC



Appendix E: Preliminary Data Inventory

<u>Layer Name</u>	<u>Data Owner</u>	<u>Yap Last Update</u>	<u>Yap Outer Isles last Update</u>	<u>Chuuk Last Update</u>	<u>Chuuk Outer Isles Last Update</u>	<u>Pohnpei Last Update</u>	<u>Pohnpei Outer Isles Last Update</u>	<u>Kosrae Last Update</u>	<u>Notes</u>	<u>PDC metadata</u>	<u>Source Metadata</u>
airport	PDC	2009		2009		2009		2009		y	
airport_area	PDC	2009				2009		2009		y	
bridge	PDC/ USACE	2009 (incomplete)				2009 (incomplete)		2009 (incomplete?)		y	
building	MC/USGS	2009 (govt bldg only)		2009 (govt bldg only)*	2009 (govt bldg only)*	2009 (incomplete? 3819 RESIDENTIAL features)			*need to add USGS buildings for Chuuk, need metadata first	y	
buisiness						2009 (incomplete, 52 features, commercial/ critical)		2009 (uncomplete, 8 features)		y	
cemetery	?					(uncomplete? 8 features)				y	
church		2009 (10 features)		2009 (incomplete, 1 feature)		2009 (30 features)		2009 (incomplete, 1 feature)		y	
clinic				2009 (1 feature)		2009 (9 features)				y	
comms		2009		2009	2009 (2 features)	2009		2009	completeness unknown	y	
electric	MC					2009		2009		y	
fire_station	PDC	2009 (1 feature)				2009 (1 feature)				y	
flood_hazard	MC	2009	2009	2009	2009 (E. Chuuk only)	2009		2009		y	
FSM_Bnd (land)		2009		2009	2009	2009				y	
fuel_tank	FSMPC	2009						2009		y	
hist_earthquake	PDC	2009 (4 features)								y	
hospital	PDC	2009		2009		2009		2009	*need capabilities for all features	y	
land_cover	MC	2009		2009		2009		2009		y	
land_form	MC	2009		2009		2009		2009		y	
landslide_hazard	MC/USGS	2009		2013	2013	2009		2009		y	

meterology	?	2009				2009				y	
municipal_bnd (village Names)	several	2009				2009		2009		y	
outer_island_profiles	IOM/PDC	2013	2013	2013	2013	2013	2013	2013	*need more data from IOM	y	
place_name	GNIS	2009	2009	2009	2009	2009	2009	2009		y	
police_station	PDC	2009 (incomplete, 1 feature)		2009 (incomplete)		2009 (incomplete, 2 features)		2009 (incomplete, 1 feature)	*need all capabilities info	y	
port	PDC	2009		2009		2009		2009	*need all capabilities info	y	
power_plant	PUC/ FSMPC	2009 (5 features)		2009 (1 feature)		2009 (1 feature)		2009 (2 features)	*need all capabilities info	y	
quarry	?			2009 (1 feature)		2009 (1 feature)				y	
road	multiple	2009		2009		2009				y	
school	?/multiple	2009	2009	2009	2009	2009	2009	2009	*don't use much b/c of viewer basemaps	y	
sea_wall	unk					features)		2009		y	
shelter	USACE	2009 (5 features)								y	
states_bnd	?	2009	2009	2009	2009	2009	2009		*complete	y	
stream	USACE	2009		2009		2009		2009		y	
wastewater_line	YSPCS	2009				2009		2009		y	
wastewater_trmt_pt	YSPSC	2009 (incomplete)		2009 (incomplete)		2009 (incomplete)		2009 (incomplete)		y	
water_line	YSPSC	2009						2009		y	
water_tank	YSPCS	2009 (4 features)		2009 (incomplete)		2009 (incomplete)		2009		y	

CHUUK

Task: Files checked for consistent projection

Name of folder	Shapefile	Type	Projection	Action 1	New Projection	Meta	Attribu	Comment	Action 2	NEW FILE
dem_rectified	demtora_truc1	GRID	WGS84 UTM 84N							
	project_demt1	GRID	WGS84 UTM 84N							chk_dem
	truck10m-corrected.dem	GRID	NAD83 UTM 84N							
	truck10m-corrected-recl.ir	IMG	NAD83 UTM 84N							
	outline-fromtruck10mden	poly	NAD83 UTM 84N	project	WGS84 UTM 56N					
elev_contours	chuuk_elvzns	poly	undefined	define projectic	WGS84			wrong projecti	shift ~390 NE	chk_elevations
grassland	grasslnd	poly	WGS84 UTM 56N	define projectic	WGS84			wrong projecti	project WGS84 UTM 56N	chk_grassland
hillshade	chuuk_hillshd	GRID	WGS84 UTM 56N							chk_hillshade
	truck10m-corr-hls.img	IMG	NAD83 UTM 84N							
hydrography	chuuk_hyd	GRID	WGS84 UTM 56N							can't be copied
islands (all state)	chk_state_islands	line	WGS84 UTM 56N							chk_islands-state
mangroves	chmamgrv	poly	WGS84 UTM 56N	define projectic	WGS84			wrong projecti	project WGS84 UTM 56N	chk_mangroves
outer islands	chouterislands	poly	WGS84 UTM 56N	define projectic	WGS84			wrong projecti	project WGS84 UTM 56N	chk_islands-outer
reefs (all state)	chreef	poly	WGS84 UTM 56N	define projectic	WGS84			wrong projecti	project WGS84 UTM 56N	chk_reefs
rivers	chuukrivers	line	WGS84 UTM 56N	define projectic	WGS84			wrong projecti	project WGS84 UTM 56N	chk_rivers
rivers from dem-strahler	rivers_dem-strahler	line	undefined	define projectic	WGS84			wrong projecti	project WGS84 UTM 56N/ shift 36	chk_rivers-strahler
	rivers_usgs	line	undefined	define projectic	WGS84			wrong projecti	project WGS84 UTM 56N/ shift 36	chk_rivers-usgs
	rivers_usgs-source-pts	point	undefined	define projectic	WGS84			wrong projecti	project WGS84 UTM 56N/ shift 39	chk_rivers-usgs-source-pts
rivers lines	chuuk_riv-project	line	WGS84 UTM 56N					similar to chuukrivers (some streams are not included here though) but shifted		
rivers riparian zone	chuuk_riparian	poly	WGS84 UTM 56N							
roads and trails	chtransp	line	WGS84 UTM 56N	define projectic	WGS84			wrong projecti	project WGS84 UTM 56N	chk_roads
swamps	chswamp	poly	WGS84 UTM 56N	define projectic	WGS84			wrong projecti	project WGS84 UTM 56N	chk_swamps
urban zones	churban	poly	WGS84 UTM 56N	define projectic	WGS84			wrong projecti	project WGS84 UTM 56N	chk_urban-zones
vegetation	pic_fsm_chuuk_draft	poly	WGS84 UTM 56N					30m SE		chk_vegetation
vegetation 2	usgs_veg	poly	undefined	define projectic	WGS84			~420m off	project WGS84 UTM 56N	
	usgs_veg2	poly	undefined	define projectic	WGS84			identical to	shift ~420 m NE & project to WGS	chk_vegetation-usgs
watersheds (merge all ir wenobasin10 -- change to		TIF	undefined					???		

KOSRAE

Task: Files checked for consistent projection

Name of folder	Original Shapefile Name	Type	Projection	Action 1	New Projection	Metadata	Comment	Action 2	NEW FILE Name
airport	kos_airport	poly	WGS84 UTM 58N			no	perfectly!!		kos_airport
contours	contours_kosrae_utm	line	WGS84 UTM 58N	change (define)	prc Clarke 1966 UTM 58N	no	about 40 meters off	project to WGS84 UTM 58N	kos_10m-contours
dem	prjkos_dem1	GRID	WGS84 UTM 58N			no	same, just diff		
	kosrae10m-corrected	USGSDEM	NAD83 UTM 58N			no			
	demtora_kosr1	GRID	NAD83 UTM 58N	project	WGS84 UTM 58N	no			
elev contour polys	kos_elvzns	poly	undefined	define projection	WGS84	no	with DEM, derived	project to WGS84 UTM 58N	kos_50m-contour-intervals.shp
hillshade	kos_hilshade	raster	WGS84 UTM 58N			no			kos_hillshade
mangrove	mangrove	poly	WGS84 UTM 58N	wrong projection		YES	projection yet,		
mangrove harvesting	mangrove harvesting	poly				no	projection yet		
Marine Park	marine park_rectified	poly	undefined			no	sure where it should		
municipal boundaries	municipal-lines	lines	undefined	define projection	WGS84 UTM 58N	no	with		kos_municipal-boundaries.shp
municipalities	kosrae_jurisdoctions	poly	WGS84 UTM 58N			no	on west side, but a		kos_municipal-boundaries_poly.shp
reef	reef	poly	WGS84 UTM 58N			no	areas overlay better		kos_reef
rivers	river_dem-strahler	line	undefined	define projection	WGS84	no	areas close to coast	project to WGS84 UTM 58N	kos_rivers-dem-strahler.shp
rivers	river_usgs-source-pts	point	undefined	define projection	WGS84	no	60m to align with	project to WGS84 UTM 58N	kos_rivers-usgs-source.shp
rivers	rivers_usgs	line	undefined	define projection	WGS84	no	Kosrae CS too	project to WGS84 UTM 58N	
rivers lines	kosrae_sdts_riv_Proje	line	WGS84 UTM 58N			no	but better aligned to		kos_rivers-usgs
rivers riparian zone	kosrae_sdts_riv_Proje	poly	WGS84 UTM 58N			no	100-m-buffer		kos_rivers-usgs-100m-buffer.shp
road track	road track	line	undefined	define projection	WGS84 UTM 58N	no	loops		
asphalt road	asphalt	line	undefined	define projection	WGS84 UTM 58N	no	overlays with ~ 60 m	-> kos_road-asphalt	kos_road-asphalt
roads digitized	roads_digi	line	WGS84 UTM 58N			no	doesn't follow roads		
sanctuary	sanctuary	poly	WGS84 UTM 58N			no	looks good		kos_sanctuary
shoreline	ks	poly	undefined	define projection	Clarke1966 UTM 58N	no		project to WGS84 UTM 58N	
soils	USDA_soil_survey_reg	poly	WGS84 UTM 58N	wrong projection	Kusaie_1951	no		project to WGS84 UTM 58N	kos_soils-usda
vegetation	usda_veg	poly	undefined	define projection	WGS84	no	shapefiles same	project to WGS84 UTM 58N	
vegetation	usda_veglam150	poly	undefined	define projection	WGS84	no		project to WGS84 UTM 58N	
vegetation	xusda_veg	poly	WGS84 UTM 58N			no			
vegetation 2	usda_veg	poly	undefined	define projection	WGS84	no	records)	project to WGS84 UTM 58N	
vegetation 2	usda_veg2	poly	undefined	define projection	WGS84	no	but with less	project to WGS84 UTM 58N	kos_veg-usda
vegetation 3	Kosrae_Veg_Polys_UT	poly	WGS84 UTM 58N			YES	but less records	spatial adjustment	kos_veg
watershed	watershed	poly	WGS			no	watersheds, just a		kos_watershed

RESULT: 19/30 shapefiles needed adjustment in projection

POHNPEI

Task: Files checked for consistent projection, underway

Feature	Shapefile	Type	Projection	Action 1	New Projection Metadata	Attributes	Comment	Action 2	NEW FILE
base	base_utm_proj-shift			project - shift					
	coastline								
	coral_Project			shifted					
	crit_fac_bldgs_pn_utmz57								
	drainage_project			shifted					
	existing distribution line			project - shift					
	flood hazard			project					
hydrography	hyd								
hypsography	hyp								
	intactuplandforest_Project			shift					
	landslide_hazard_transform			project - shift					
	muni_dd84_utm			project - shift					
	municipality								
	park								
	park_buffer								
	PNI_BD_MarineSanctuary								
	pni_elvzns			project					
	pni_rds_trails_0709_Project								
	pni_ws_utm								
	pohnpei_riv_Project			shifted					
	Pohnpei_valuation								
	pohnpi_zone_Projec-shift								
	rivers_dem-strahler_project-utm								
	sewer_lines_adj_ut,57_Project				spat adjusted				
	soils_new_utm				shifted				
	state (outline)		poly						
	water_pipelines								
	watertanks				shift				
wetlands				shift					

dem

Questionable files regarding location (could not be confirmed but may be correct)

alco_barge_utm

com fsm campus_shifted

fsm capitalCopy

intake structuresCopy

intensive agricultue_project-shift

marsh_shifted

pump station_project

schools_project

swampforest_shifted

water wellsCopy

YAP

Task: Files checked for consistent projection

Name of folder	Shapefile	Type	Projection	Action 1	New Projection	Metada Attributes	Comment	Action 2	NEW FILE
airport	airport	poly	WGS84	project	WGS84 UTM 54N	no	well		yap_airport
burned areas	burned_areas_2001	poly	WGS84	project	WGS84 UTM 54N	YES	off		yap_burned-areas-2001
	burned_areas_2002	poly	WGS84	project	WGS84 UTM 54N	YES			yap_burned-areas-2002
	burned_areas_2003	poly	WGS84	project	WGS84 UTM 54N	YES			yap_burned-areas-2003
	burned_areas_2004	poly	WGS84	project	WGS84 UTM 54N	YES			yap_burned-areas-2004
churches	churches	point	WGS84	project	WGS84 UTM 54N	some	may be ~20 off		yap_churches
coast guard reservation	coast_guard_reservation	poly	WGS84	project	WGS84 UTM 54N		looks good but		yap_coastguard-reservation
COM campus	college_of_micronesia	poly	WGS84	project	WGS84 UTM 54N		shifted ~ 20m	shift ~ 20r	yap_collage-of-micronesia
conservation areas	conservation_areas/yap_con	poly	WGS84	project	WGS84 UTM 54N	YES	Conservancy,		yap_conservation-areas
dancing grounds	dancing_grounds	point	WGS84	project	WGS84 UTM 54N		Village nam can't be		yap_dancing-grounds
dem	demtora_yap11/hilsha_demt	GRID	NAD83 UTM 54N						
dem	prjtyap_demt1	GRID	WGS84 UTM 54N						yap_dem
hillshade	projyap_hill1	GRID	WGS84 UTM 54N						yap_hillshade
dem_rectified	yap10m-corrected.dem	USGSDM	NAD83 UTM 54N						
elevation contours	contour 10m	line	WGS84	project	WGS84 UTM 54N		line (ragged)		yap_contours-10m
	contour 1m	line	WGS84	project	WGS84 UTM 54N				yap_contours-1m
	yap_elvzns	poly	undefined	define projection	WGS84		OFF - about	project to	WGS84 UTM 54N
fishtraps	fishtraps	line	WGS84	project	WGS84 UTM 54N		between 60-		yap_fishtraps
gilman_retaining_wall	gilman_retaining_wall	line	WGS84	project	WGS84 UTM 54N		W)		yap_gilman-retaining-wall
graves and burial grounds	graves	point	WGS84	project	WGS84 UTM 54N		cannot be		yap_graves
	burial ground	poly	WGS84	project	WGS84 UTM 54N		cannot be		yap_burial-grounds
hydrography	yap_hydro_points	point	undefined	define projection	WGS84 UTM 54N		QB rel good		yap_hydro-points
	yap_hydro_lines	line	undefined	define projection	WGS84 UTM 54N		QB rel good		yap_hydro-lines
	yap_hydrography_areas	poly	undefined	define projection	WGS84 UTM 54N		QB rel good		yap_hydro-areas
japanese lighthouse	japanese_lighthouse	poly	WGS84	define projection	WGS84 UTM 54N		confirmed, but		yap_lighthouse
labels -- reefs and channels	labels_reef and channel	point	undefined	define projection	WGS84		labelled, looks	project to	yap_reef-channel-labels
lakes	lakes	poly	WGS84	define projection	WGS84 UTM 54N		20m???		yap_lakes
meeting houses	magachgil	point	WGS84	define projection	WGS84 UTM 54N		cannot be		yap_magachgil
	mens_houses	point	WGS84	define projection	WGS84 UTM 54N		spoton, others		yap_mens-houses
	mens_houses_area	poly	WGS84	define projection	WGS84 UTM 54N		12-17m off		yap_mens-houses_poly
municipalities	municipalities	point	WGS84	define projection	WGS84 UTM 54N		good		yap_municipalities
	yap_municipalities	poly	undefined	define projection	WGS84		identical to	project to	yap_municipalities_poly
reefs	yapreef arc	line	undefined	define projection	WGS84			project to	WGS84 UTM 54N
	coral reefs	poly	WGS84	project	WGS84 UTM 54N		> shift NNW	shift	yap_coral-reefs

rivers and streams	rivers_usgs	line	undefined	define projection	WGS84		(shift NW),
rivers and streams	streams	line	WGS84	project	WGS84 UTM 54N		follows DEM project to yap_rivers
rivers from dem-strahler	rivers_usgs-source-pts	point	undefined	define projection	WGS84		with yap_riv-
	rivers_dem-strahler	line	undefined	define projection	WGS84		(shift NW),
river lines	yap_riv-project	line	WGS84				as rivers_usgs
rivers riparian zone	yap_riparian	poly	WGS84				rivers_usgs,
roads	roads	line	WGS84	project	WGS84 UTM 54N		not yap_roads
roads and trails	loop_road_culverts	points	WGS84	project	WGS84 UTM 54N		GPS data with attributes, l yap_culverts
	yap_roads-and-trails_lines	lines	undefined	define projection	WGS84 UTM 54N		shifted ~30m
schools	school_tamilung_points	points	WGS84	project	WGS84 UTM 54N		on bldgs, yap_school-tamilung
	school	points	WGS84	project	WGS84 UTM 54N		labelled, some yap_schools
	headstart_centers	poly	WGS84	project	WGS84 UTM 54N		shifted ~15- shift (15.4 yap_school-headstart-center
	school_bldgs	poly	WGS84	project	WGS84 UTM 54N		20m (not shift (19.4 yap_schools_poly
shorelines	wa'ab	poly	WGS84	project	WGS84 UTM 54N		40m -> not shift (40m yap_shoreline
soils	soils	poly	WGS84	project	WGS84 UTM 54N		same offset as yap_soils
vegetation	fsm_yap_pic_vegetation	poly	WGS84 UTM 54N				polygons not
vegetation 2	usgs_veg	poly	undefined		????		
	usgs_veg2	poly	undefined		????		
vegetation 3	vegetation	poly	WGS84	project	WGS84 UTM 54N		shifted ~27m shift yap_vegetation
villages	villages	point	WGS84	project	WGS84 UTM 54N	YES	can't be yap_villages
	yap_villages	area	undefined	define projection	WGS84	no	project to yap_villages_poly
	yapvillagemap	.jps	undefined	define projection	WGS84	no	project to Yap_village-map
watersheds	watershed_boundaries	line	WGS84	project	WGS84 UTM 54N	YES	with hillshade yap_watersheds

FSM

Task: Files checked for consistent projection

Name of folder	Shapefile	Type	Projection	Action 1	New Projectic Metada: Attributes Comment	Action NEW FILE
ABS areas	ABS_All_Areas	poly	World_Cylindrical_Ec	project	WGS84	fsm_abs
all FSM rivers lines	fsm_rivers_usgs	line	undefined	define projection	WGS84	
all FSM rivers points	fsm_rivers_usgs-srce pts	point	undefined	define projection	WGS84	not exact on river line source
Bathymetry (world)	bath_polu	poly	undefined	define projection	WGS84	world_bathymetry
Ecoregions	ecoregons_bnds	poly	undefined	define projection	WGS84	fsm_ecoregions
EEZ	200_mile_buffer-of_land_area	poly	WGS84 UTM 56N	project	WGS84	fsm_land-area-200-mile-buffer
FSM States	fsm_states	poly	undefined	define projection	WGS84	
GNIS_All_Features	GNIS_All_Features	point	WGS84			fsm_gnis-all-feature
GNIS_Populated_Features	GNIS_Populated_Features	point	WGS84			fsm_gnis-populated-features
Island and atoll outlines	FSM_Final_Baselines	line	WGS84			fsm_baselines
Islands as blocks	fsm_blocks	poly	undefined	define projection	WGS84	
Millenium Reeds	Micronesia_v6	poly	WGS84			
MobileMapper landmarks	irei_pts	point	WGS84			
Name labes - islands	fsm_island labels	point	undefined	define projection	WGS84	
Name labels - passages	fsm_passage labels	point	undefined	define projection	WGS84	
Nature conservancy report occurances	Occurances	poly	World_Cylindrical_Ec	project	WGS84	fsm_occurances-tnc
Outer Islands banks	fsm - outer islands - banks	line	WGS84			fsm_outer-islands-banks.shp
Outer Islands islets	islets	poly	undefined	define projection	WGS84	fsm_outer-islands-islets.shp
Outer islands points	fsm - outer islands - locations	points	WGS84			fsm_outer-islands-points.shp
Outer Islands reefs	reefs	poly	undefined	define projection	WGS84	fsm_outer-islands-reefs.shp
Pacific coastlines	oastlines_pac	poly	World Mercator	project	WGS84	
ReefBase for FSM						better data available
Simple base map	fsm_base	poly	undefined	define projection	WGS84	
	fsm_base-mask	poly	undefined	define projection	WGS84	
	fsm_base-simple	poly	undefined	define projection	WGS84	

Appendix F: Participant List



Kick-Off Meeting: Geospatial Information Development and Application in the Federated States of Micronesia

May 2, 2013

College of Micronesia – FSM, Pohnpei, FSM

Participant List			
Name	Affiliation	Contact e-mail	Signature
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Regrets, but Please Keep Us Informed			
<i>Fenno Brunken</i>	<i>Secretariat of the Pacific Community</i>	<u>FennoB@spc.int</u>	
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Suggested Contacts for Future Participation and / or Information			
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Appendix G: Compiled Workshop Session Notes

Session 1, Question 1

Think of the decisions you make and the activities your organization is responsible for. How do you currently use geospatial information to execute your mission?

1. Guide during census/survey
2. Present Census statistics and analysis results in a more understandable format for decision makers
3. Enhance analysis
4. Planning for DM response and coordination
5. Telecom planning and maintenance (could apply to other infrastructure)
6. Public awareness
7. Marketing
8. Monitoring hazards and environmental conditions
9. Identify landslide risk (could apply to other hazards)
10. Damage assessment
11. Hazard zone identification and analysis of overlap
12. Exposure assessment (Could use for vulnerability and/or risk assessment)
13. Performing Environmental Impact Assessments
14. Education and geographic literacy
15. Conservation planning
16. Ocean and water management
17. Vegetation and resource mapping
 - a. Identify changes
 - b. Could use to identify exposure
18. Island profiles to support disaster response and mitigation
19. Link to/ leverage other efforts like those of IREI
20. Invasive species tracking
21. Community planning
 - a. Land use
 - b. Solid waste management
 - c. Infrastructure
22. Enables prioritization and designation of MPAs
23. Land surveys
24. Mapping roads
25. Tracking shoreline changes
26. Tracking climate change effects
27. Supporting public health activities

Session 1, Question 2

What geospatial information and/or resources would help your organization achieve your goals more effectively or more easily?

1. Hyperspectral and multispectral data, not just visible spectrum, especially for vegetation and marine environments. Might be more efficient to identify.
2. Topographic surveys in the field for data poor and flat environments/islands

3. Portable hardware and accompanying software for GIS to create GIS files in the field
4. Bathymetric data
5. Lidar
6. Expat info for DM coordination
7. Enhanced capacity – greater tech knowledge and more people to use it/ apply it
8. Information sharing
 - a. Reduce cost
 - b. To support DM (especially response and coordination)
 - c. Enhance current datasets
9. Prediction data (weather and climate), long term and short term
10. 3D modeling for public awareness
11. GIS and geodata access and personnel who can explain and use (later in-house HW/SW)
12. Geospatial gov office
13. Updated HH way points as baseline for Census
14. High res maps – temporal and spatial
15. Hardware – servers, storage and access
16. Modeling climate change
17. Updated DEM, including outer islands
18. Place names
19. Baseline data
 - a. Historical maps
 - b. Historical aerial photos to identify change and provide evidence

Session 1, Question 3

What constraints do you have in accessing, managing, or using geospatial information?

1. Internet Connection
2. Hardware/ software
3. Human capacity (knowledge and numbers)

Session 2, Question 1

What geospatial resources can your organization make available to others in FSM and/or beyond?

Please describe thematic content, coverage, and format, if possible. If you are primarily a data user, how and from what sources do you access information?

1. Vegetation 2006
2. ABS (including protected areas)
3. MPAs
4. Utilities – waste water, power lines, etc. for Kosrae in mapinfo and .shp files
5. Kosrae historical aerial photos (Bishop Museum in Honolulu can provide others? Kosrae, with NZ NIWAR, tracked and compared 1944-2009 and compared with Qbird)
6. Hazard information
7. USGS contours

8. Soils for all main islands (every 10 years)
9. GPS controls
10. Lidar for Kosrae
11. IFRA maps
12. SWARS maps
13. Telecom for all islands with coverage
 - a. TV coverage
 - b. DSL coverage
 - c. Cell coverage
14. SBOC info for entire FSM in WGS 84 /.shp
 - a. HH locations
 - b. Housing characteristics
 - c. Number of people
 - d. Education
 - e. Health
 - f. Mortality
 - g. Fertility
 - h. Fishing
 - i. Agriculture
 - j. Durables (cars, boats, etc.)
15. SBOC for outer islands
 - a. Rain catchment (Y/N)
 - b. Gutters
 - c. Water spouts
 - d. Solar (check)
 - e. Water tanks
 - f. Wells
16. Sea level rise
17. Climate change modeling
18. NOAA
19. PDC
20. SOPAC
21. RSPC
22. NRCS
23. USFS
24. USDA
25. IMARS (marine and aquatic)
26. URS
27. NORMA
28. KIOST
29. USCG (main harbor on Yap)
30. HPO (archaeological and cultural resources?)

31. CISRO climate futures
32. URS all-hazards reports
33. IOM prepositioned supplies and warehouses (very important)
34. State EM offices
35. DECO annual reports
36. UNOCHA
37. The Nature Conservancy (TNC)
38. Pacific Disaster Net

Session 2, Question 2

What specific challenges do you see to sharing information?

1. FSM doesn't have copyright laws.
2. Before data, information or report is officially published, people ask for it; information has been misused in the past. *Don't release until formally published. Clearly cite sources and include use constraints. Formal agreements on how info is shared.*
3. Information can be power and ensures organizational or individual relevance. Sometimes a mentality of "That's MY information" and people don't want to share. *Ensure full credit and citing, though overcoming this obstacle will need to include incentivizing sharing over not sharing.*
4. Sensitivity of information or government/corporate property.
5. In some cases, such as with the raw census information, can't share by law, as it includes individual level data. *If removed or aggregated, can share. HH coordinates can probably share, and specific requests can likely be accommodated.*
6. Inadequate feedback loops, tracking and updates; enhancements may be made, but they are not noted or shared.
7. Technology – can't open, incompatible software or file formats.
8. Accuracy and reliability of source. Does data reach standards needed? *Metadata.*
9. Not knowing the use or intended application; may go through multiple people and is passed along without tracking or info. *Metadata can help.*
10. Publicity and awareness of data and resources.

Appendix H: Data Inventory Questionnaire

<u>Layer Name</u>	<u>Data Owner</u>	<u>Yap Last Update</u>	<u>Yap Outer Isles last Update</u>	<u>Chuuk Last Update</u>	<u>Chuuk Outer Isles Last Update</u>	<u>Pohnpei Last Update</u>	<u>Pohnpei Outer Isles Last Update</u>	<u>Kosrae Last Update</u>	<u>Notes</u>	<u>Source Metadata</u>	<u>File Format</u>	<u>Releasable?</u>	<u>Constraints</u>
EXAMPLE-airport	PDC	2009		2009		2009		2009		y	shapefile	y	
DSL Coverage	FSM Telecom								all islands with coverage				
TV Coverage	FSM Telecom								all islands with coverage				
Cell Coverage	FSM Telecom								all islands with coverage				
# of people	SBOC								all of FSM, but no individual level can be shared, must be aggregated / made anonymous for any possibility of sharing, same for all SBOC data		WGS 84 / .shp for all SBOC		
Agriculture	SBOC								all of FSM		.shp for all SBOC		
Durables	SBOC								all of FSM		.shp for all SBOC		
Education	SBOC								all of FSM		.shp for all SBOC		
Fertility	SBOC								all of FSM		.shp for all SBOC		
Fishing	SBOC								all of FSM		.shp for all SBOC		
gutters	SBOC								for outer islands		.shp for all SBOC		
Health	SBOC								all of FSM		.shp for all SBOC		

Soils									all main islands updated every 10 years				
SWARS maps									need more info on themes / data available				
USGS contours													
Vegetation									from 2006				
Wastewater									brought up in context of Kosrae				

<u>Layer Name/Theme</u>	<u>Potential Data Owner</u>	<u>Suggested Contact</u>	<u>Contact Information</u>	<u>Notes</u>
Historical aerial photos	Bishop Museum			Lara will follow up on this
Archaeological and cultural resources	HPO			
Prepositioned supplies and warehouses	IOM			
Main harbor on Yap	USCG			
Marine and aquatic	IMARS			
	SOPAC			
	RSPC			
	NRCS			
	USFS			
	USDA			
	URS			
	NORMA	Alfred Lebehn, Jr	alfred.lebehnj@norma.fm	
	KIOST			
	State EM offices			
	DECO			
	UNOCHA			
	The Nature Conservancy			
	CISRO			