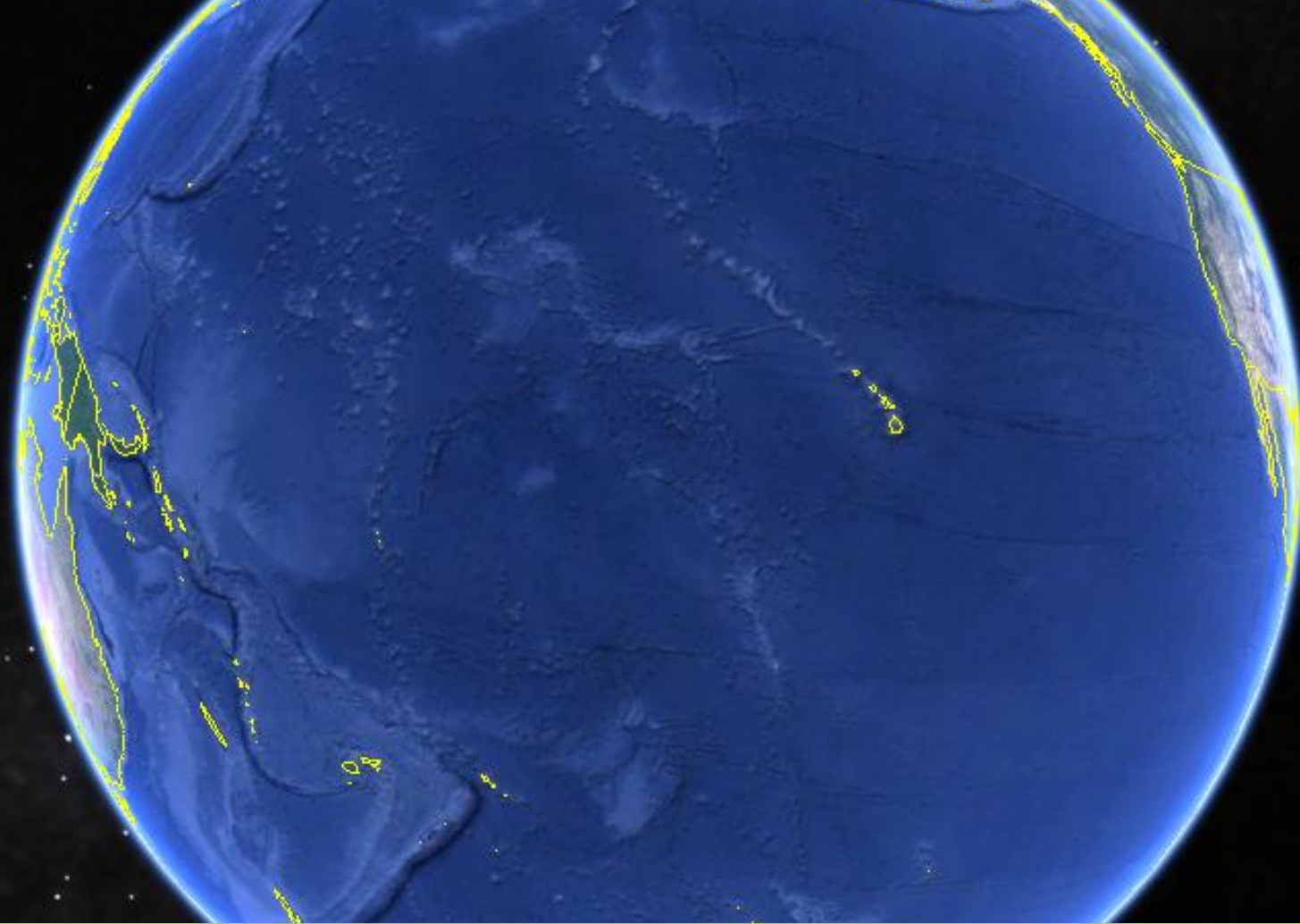




Achieving digitization of biological collections from the Pacific

SHELLEY JAMES, BISHOP MUSEUM, HAWAI'I





Pacific Ocean

ca. 1/3 Earth's surface



Polynesia- Micronesia Hotspot

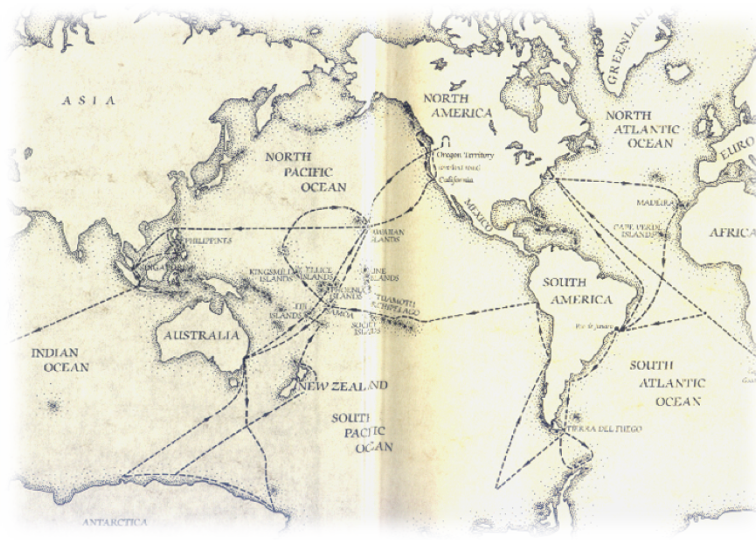
>4,500 islands

20 countries, 3 million people

46,315 km²

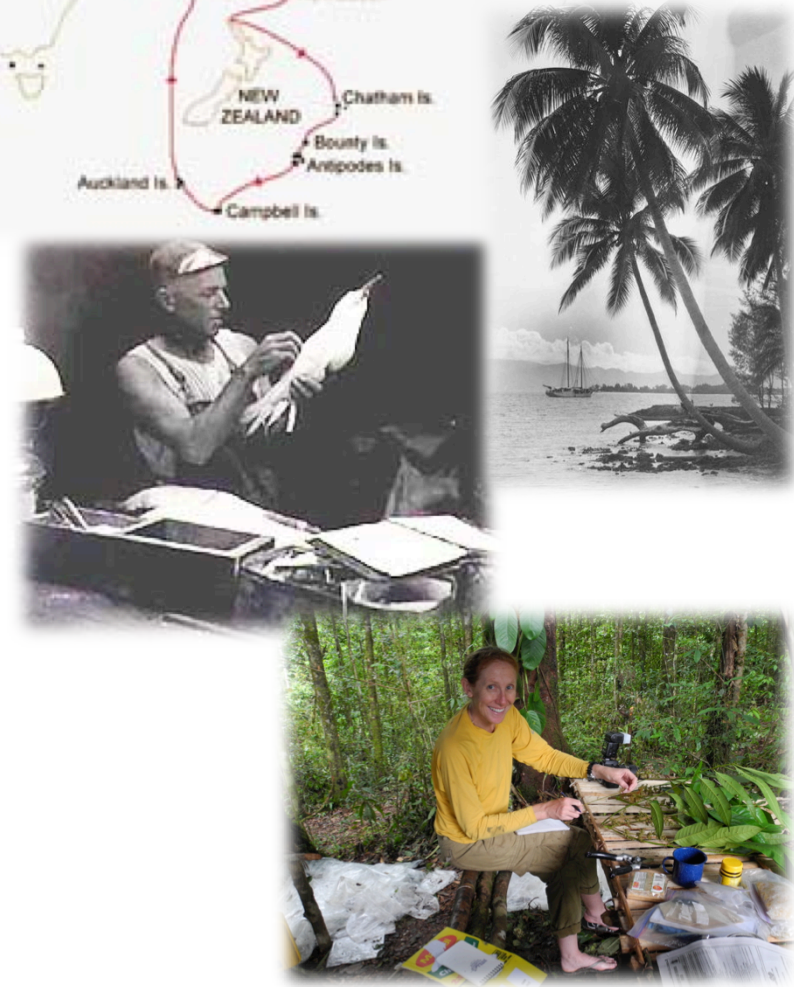
More than 22 herbarium
collections in region – 95% fit
definition of “small”.





Exploration & Scientific Discovery

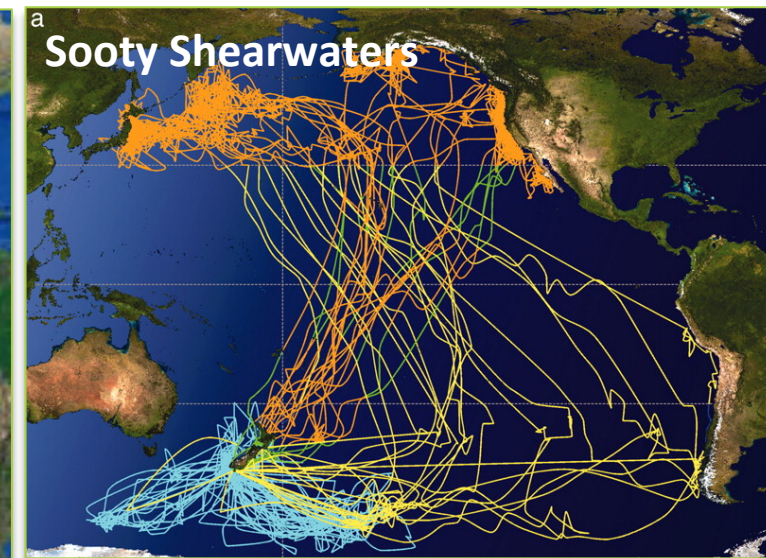
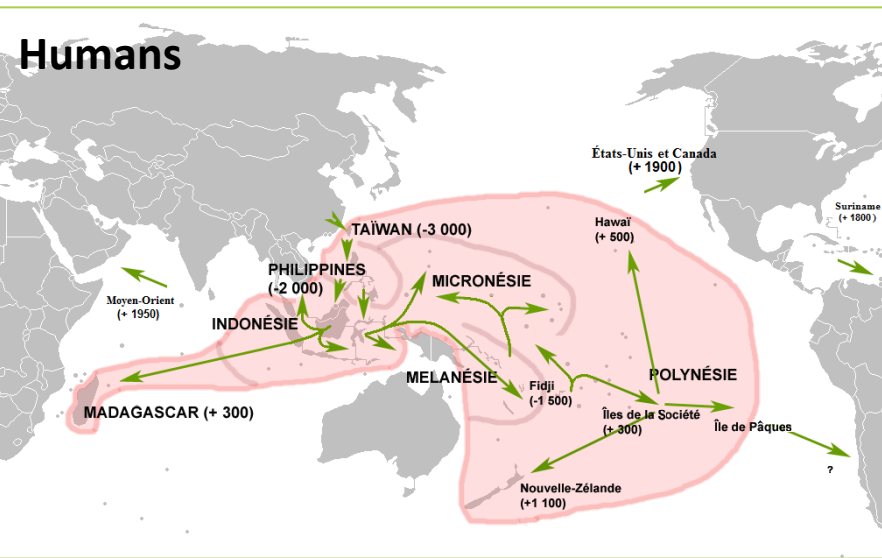
- 1768-79: Cook's Voyages
- 1791-93: HMS *Providence* (Bligh' breadfruits)
- 1815-18: Rurik Russian Expedition (von Chamisso – Marshall Islands)
- 1826-29: *L'Astrolabe* (D'Urville, Gaimard, Quoy, Lesson)
- 1865: HMS *Curacoa*
- 1838-42: US Exploring Expedition (Wilkes Expedition)
- 1886-96: USS *Albatross* (inventory Pacific Fish reserves)
- 1921-32: Whitney South Seas Expedition
- 1923-24: Tanager Expeditions – Northwestern Hawaiian Islands
- 1924: Whippoorwill Expedition (Line Islands)
- 1933-34: Tempelton Crocker "Zaca" Expedition
- 1934: Mangareva "Islander" Expedition
- >50 Natural History expeditions within Pacific by Bishop Museum staff from 1899-1981...and into the present



Moving & Changing Biodiversity

Natural History collections answering questions and educational tool for understanding:

- Island biogeography – immigration, extinction, emigration, vicariance, etc.
- Invasive species
- Human activities
- Conservation
- Taxonomy
- Cultural history
- New species discovery and gap analysis



Collections Issues

- Remoteness
- Cultural differences
- Funding
 - Time
 - Staffing
 - Training
- Infrastructure
 - Space
 - Equipment (including internet access)
 - Natural Disasters, IPM

Digitization & other initiatives



SPECIES NAME	COLLECTION	World
SHEET NO: 195744	BARCODE: BISH101370	ACC. NO:
SPECIES NAME: <i>Thalassiosira</i>		
BASIONYM: <i>Polysiphonia</i>		
DETERMINED BY: Jim van Jaars, S.A.	DET. DATE: Oct 2012	DET. BY: JBSH
COLLECTOR: Salschner, F.R.R.	HABITAT:	
COLL. TEAM:	PLANT DESC:	
COLL. NUM: 18020	DATE: Sep 1900	
VERBATIM LOCALITY AS IT APPEARS ON LABEL:		
State: Mozambique	Country: Pacific Ocean	
Region: Malakka	Local Name:	
ELEVATION: 1100m	DEPTH:	
VOUCHER:		



Micronesia 2013-02: 1-91

Bibliographic checklist of the marine benthic algae of Central Polynesia in the Pacific Ocean (Excluding Hawai'i and French Polynesia)

ROY T. TSUDA AND SEANA K. WALSH¹
¹Herbarium Pacificum - Botany, National Science, Bishop Museum
 1525 Bernice Street, Honolulu, Hawaii 1 96817-2704, USA
 e-mail: roy.tsuda@bishopmuseum.org

Abstract— The Polynesian algal bibliographic checklist is based on records from past references for American Samoa and Samoa (380 spp.), Cook Islands (111 spp.), Johnston Atoll (190 spp.), Line Islands (250 spp.), Niue (3 spp.), Phoenix Islands (193 spp.), Pitcairn Islands (23 spp.), Tokelau (1 sp.), Tonga (109 spp.), Wake Atoll (121 spp.) and Wallis and Futuna (191 spp.) and consists of three sections. The first



Consortium of Pacific Herbaria



Plant TCNs

- Macroalgal Herbarium Consortium
- Consortia of North American Bryophyte & Lichen Herbaria
- Mycology Collections Portal



Tritrophic TCN

- Barcoding and databasing of BPBM insect collections



Global Plants

- Type and rare specimen digitization
- Access for LAE



Papua New Guinea

- Digitization of BISH Collections
- New collections & tissues
- Online checklist and bibliography



Pacific Biological Survey



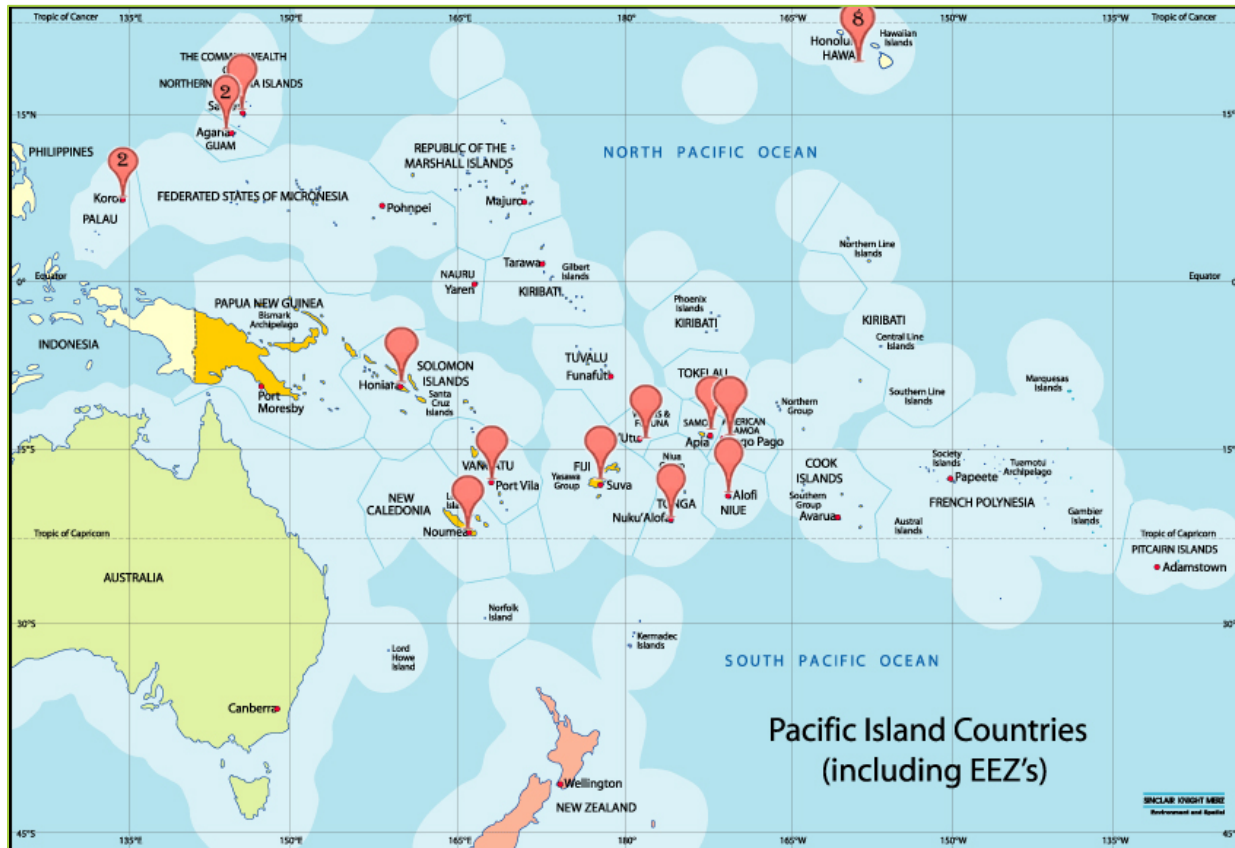
To discover, document and inventory the flora and fauna of the Pacific Islands; advancing science, technology & sustainable development



Hawaii Biological Survey

To discover, document and inventory the flora and fauna of the Hawaiian Islands

Consortium of Pacific Herbaria



Pacific Herbarium	No. specimens
Belau National Museum Herbarium (BNM)	2,219
Haleakala National Park (HALE)	2,280
Hawaii Volcanoes National Park (HAVO)	4,823
<i>Herbarium Pacificum</i> , Bishop Museum (BISH)	305,000
Joseph F. Rock Herbarium, University of Hawaii (HAW)	42,115
Kalapapa National Historic Park (KALA)	956
Ministry Of Agriculture And Forestry (TON)	3,000
National Park of American Samoa (AMSA)	1,500
National Tropical Botanical Garden (PTBG)	41,972
National University of Samoa (NUS)	2,500
Niue National Herbarium (NIU)	500
Oahu Army Natural Resource Program (OANRP)	215
Palau International Coral Reef Center (PICRC)	500
Pohakuloa Training Area (PTA)	212
University of Guam (GUAM)	39,562
University of the South Pacific (SUVA)	23,139
Waimea Valley (WAIM)	914
War & The Pacific National Park (WAPA)	1,507
Total	472,914

Improving access

Equipment purchases - infrastructure

Training, especially Hawaiian and Pacific Islanders

Funding for staff, students for digitization

Backlog incorporation

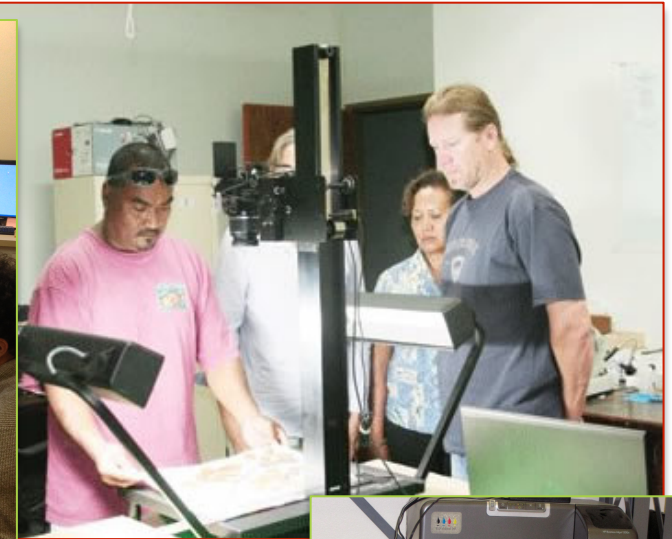
Visiting specialists

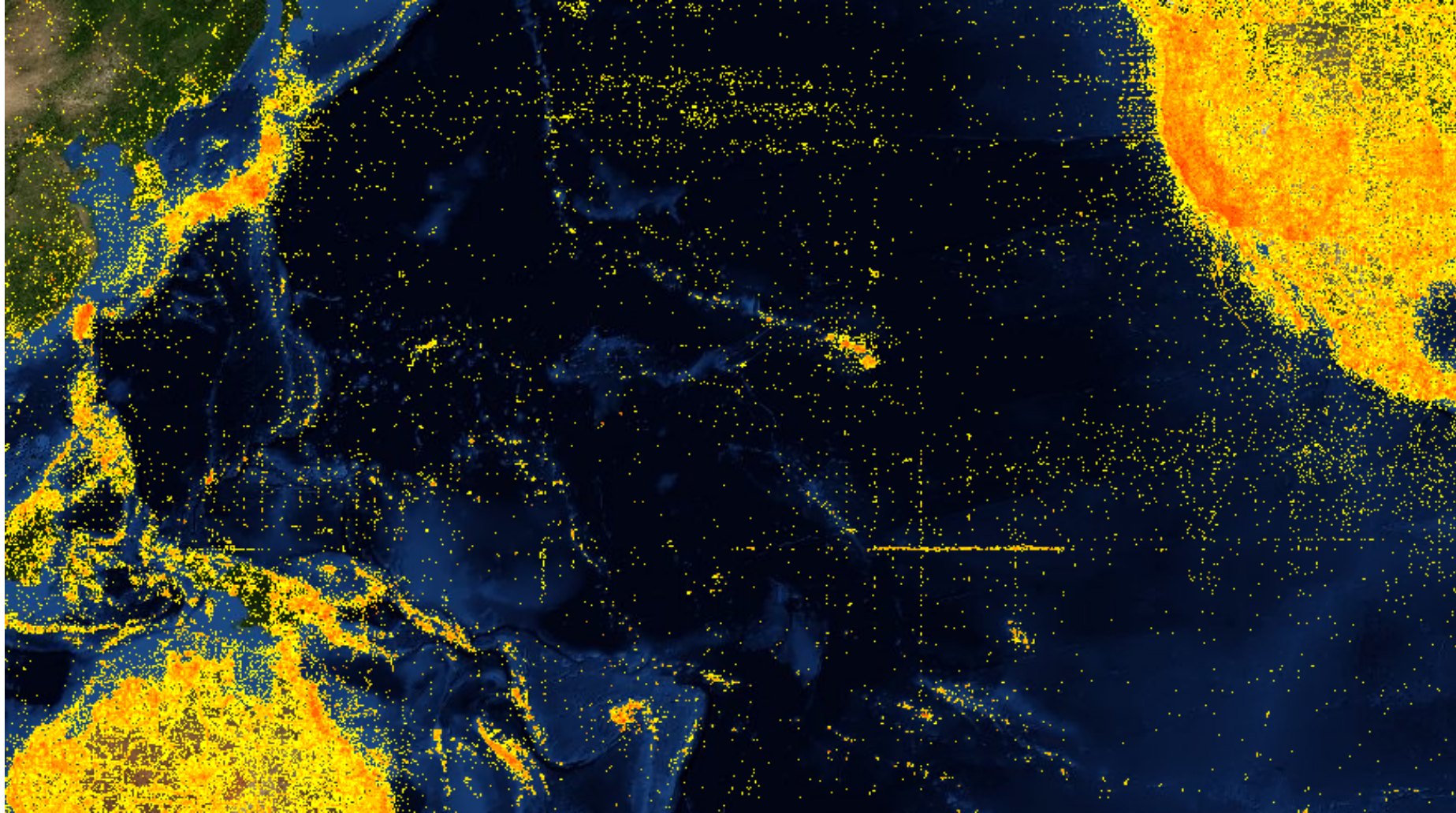
Educational programming – “Science Alive!”

PNGPlants – data repatriation and aggregation to improve databasing efficiency

Disaster Preparedness workshop

iDigBio-sponsored “Biodiversity Collections Digitization in the Pacific” March 2014





GBIF June 2014

Next steps?

Acknowledgements

BRC collaborating institutes, including:

- University of Hawaii at Manoa
- National Tropical Gardens, Kauai
- University of Guam
- Belau National Museum
- University of South Pacific

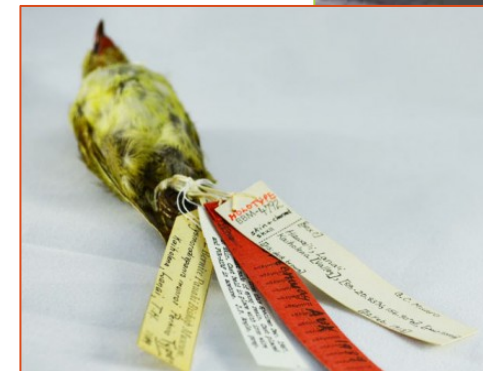
NSF-PNG collaborating institutes:

- PNG National Herbarium
- PNG National Museum
- PNGPlants collaborative

iDigBio

Bishop Museum Natural Sciences staff, interns & many volunteers

Funders (US NSF, Mellon Foundation, MacArthur Foundation)

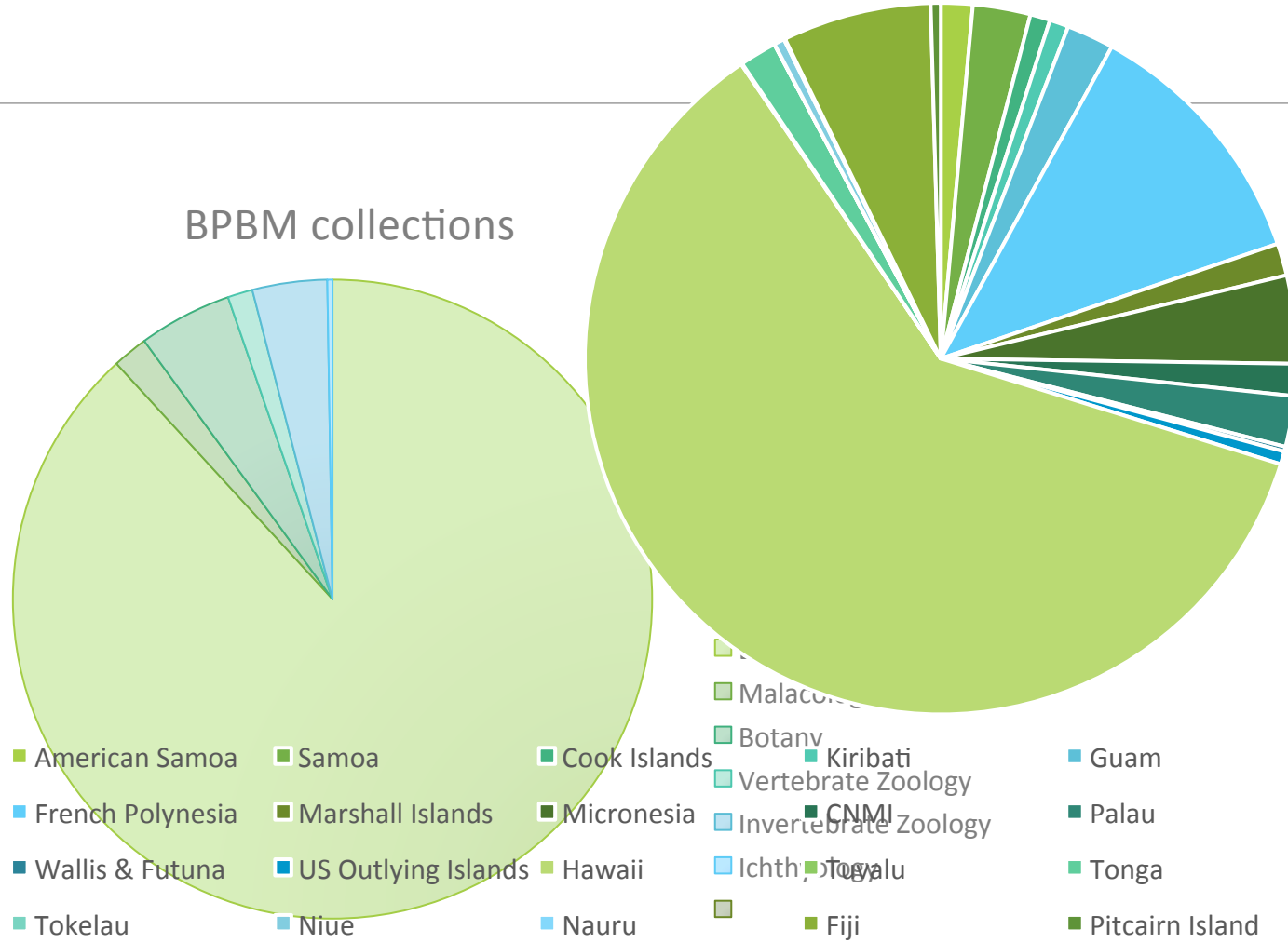




Craigie's map of the Pacific on Mercator's projection (1950)

By region

BPBM collections



Other collections data?

Country	Total Area (km ²)	GBIF	No./km ²	BISH	No./km ²
Tokelau	10	422	42	23	2
Nauru	21	671	32	123	6
Tuvalu	26	2,508	96	125	5
US Outlying Islands	34	3,868	113	1,378	40
Pitcairn Island	47	2,549	54	1,069	23
Wallis & Futuna	142	1,263	9	515	4
Marshall Islands	181	22,896	126	3,437	19
American Samoa	199	9,771	49	3,383	17
Cook Islands	240	16,571	69	2,133	9
Niue	260	6883	26	1,119	4
Palau	459	80,158	175	5,411	12
CNMI	463	14,115	30	3,403	7
Guam	541	7,390	14	5,047	9
Fed. States Micronesia	702	45,879	65	9,392	13
Tonga	748	10,366	14	3,931	5
Kiribati	811	13,393	17	2,030	3
Samoa	2,842	14,952	5	6,140	2
French Polynesia	4,167	103,247	25	27,666	7
Fiji	18,274	381,931	21	15,860	1
Hawaii	28,311	80,567	3	142,529	5
		819,400		234,714	
USA	9,826,675	20,295,040	2		