Home Front Hawai`i: a WWII Legacy Underneath the Sea
(lessons from submerged social sciences)

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Topics to be Covered:

1) The maritime heritage field = *submerged social science*

2) The Hawaiian Islands during the war years = *history*

3) The WWII resource base in Hawai`i = *maritime archaeology*

4) Wrecks and the environment = *biological interactions*

5) Access to the oceans = *evolving marine technology*

6) Maritime Cultural Landscapes = *understanding our impacts*
Submerged Social Sciences

What is Maritime Archaeology?

“The interpretation of the seafaring past through the study of things manufactured or modified by humans…usually underwater”

Field initiated by Dr. George Bass and others in the 1960s

Multidisciplinary:

Anthropology
History
Geography
Engineering
Chemistry
etc

This…

but not this…
Training in the maritime archaeology field

Types of coursework:

- archaeology
- anthropology
- history
- museum studies
- material culture
- GIS and mapping
- engineering
- acoustics
- etc

Applied skills needed:

- diving
- computer
- grant writing
- rigging
- drafting (drawing)
- photography
- archival research

Main American universities:

- Texas A&M
- East Carolina University

College graduate (Masters) degree standard for the field
Maritime Heritage: the Preservation of our archaeological resources in the sea

- National Historic Preservation Act
  section 106
  section 110

- National Marine Sanctuaries Act
  includes historic, archaeological, cultural resources

- Abandoned Shipwreck Act
  State properties under DLNR

- Sunken Military Craft Act
  military vessels remain federal property
History: Islands during War Years

Waikiki, Territory of Hawai`i, 1943

- Martial Law
- Japanese internment
- Loss of *habeas corpus*
- School closures
- Censorship
- Coastal fortifications
- Gas masks
- Curfew
- Blackout
- Rationing
- Victory gardens
- Loss of fishing fleet
History: Islands during War Years

Japanese-American loyalty on parade, Waikiki 1942
History: Islands during War Years

4th Marine Division departing Kahului, Maui
History: Islands during War Years

WWII Ground training areas, Territory of Hawai`i

US Army Museum
Keystone PK-I naval flying boat, long-range patrol bomber 1930s (USN photo)

Ford Island VP-1 squadron insignia
Archaeological Resource: 1,475+ Sunken Naval Aircraft

SB2C-1C Helldiver

SB2C-1C Helldiver (Ross and Milisen 2015)

TBF Avenger

TBF Avenger (Ross and Milisen 2015)

F6F Hellcat (HURL)

Aircraft losses per year, 1922-1952

Aircraft losses per main type (n>10)

- FM-2 Wildcat = 89
- FG-1 Corsair = 47
- F4F Wildcat = 72
- F4U Corsair = 140
- TBM Avenger = 131
- TBF Avenger = 55
- OS2U Kingfisher = 12
- F6F Hellcat = 284
- SBD Dauntless = 80
- SB2C Helldiver = 272
- PBY Catalina = 24
- PBM Mariner = 11
Evolution of amphibian vessels and tactics, 1932-1945

LCA landing craft assault, small vessel
LCI landing craft Infantry, fitted with bow doors
LCP landing craft personnel, for transporting personal
LCS landing craft support, small armed landing craft
LCT landing craft tank, up to four tanks and bow doors
LSI landing ship infantry, ship carrying LCI, or capable of being grounded
LSM landing ship medium
LST landing ship tank, RoRo vessel converted for carrying tanks
DUKW amphibious truck six-wheel drive

And specific variations of all these:
Archaeological Resource: Amphibious Vessel losses in Hawai`i

Operation Forager training exercises April-May 1944, Maui (NARA)
Combat losses in Hawai`i

*Islands only attacked a couple times*

PBY-5 site plan (Kaneohe Bay)

Japanese *Kohyoteki* (minisub) HURL

USS *Utah*

USS *Arizona*
Main Hawaiian Islands
2,127 entries in the database
Educational Collaboration: MAST courses (UH) NAS sport diver training
Biological Interaction: Wrecks in the Marine Environment
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Biology: Wrecks in the Marine Environment
Technology: Multibeam and Backscatter Data for Target Analysis

Kongsberg EM302 30khz multibeam
Range 7000m

Hull-mounted multibeam sonar

Survey KM0716

Multibeam survey

The multibeam target = Japanese submarine I-401

Survey EX1001

Backscatter imagery comparison
Technology: from Breath-hold to Bubbles and Beyond

Diving bell 17th century

Heavy gear 19th century

SCUBA 1950s

Lloyd bridges as Mike Nelson!

Open-circuit scientific diving

Closed-circuit rebreather technology
Hawai`i Undersea Research Lab
PISCES 3-person research submersibles

(HURL C Wollerman)
ROV Surveys (*Okeanos Explorer*)

Remotely Operated Vehicles
*Deep Discoverer* and *Seirios*

Range 6000m

Ship control cab

Shoreside Comm Center
Deploying Seirios and D2 ROV system
1) Oahu S-19 survey Sept 2015
2) Wake Island *Amakasu Maru* No.1 survey March 2016
3) Tinian B-29 Superfortress survey July 2016
4) Oahu Japanese mini-submarine survey Dec 2016
5) Oahu *Royal Taipan* (ex-USS *Swan*) survey Dec 2016
6) Oahu Sentaka *I-203* search Sept 2017
7) Oahu USS *Baltimore* survey Sept 2017

**NOAA CAPSTONE archaeology missions 2014-2017**
"The maritime cultural landscape signifies human utilization (economy) of maritime space by boat, settlement, fishing, hunting, shipping, and its attendant subcultures, such as pilotage, lighthouse and seamark maintenance..."
Using a landscape analysis to understand WWII on the home front

**Impact/bombing areas**
**Amphibious training areas**
**Disposal areas**
**Naval air stations**

(Submarine training areas?
Carrier training areas?
Ocean bombing ranges?)
...one of the most organized, premeditated, regimented, and patterned forms of human behavior...the action of military units on a battlefield are based on the tactics of the prevailing military wisdom of the day; they are not random. (Potter et al 2000)
Amphibious rehearsal exercises
Maui Island, Operation Forager,
May 1944
Examples of modern military training landscapes in Hawai`i
Potentially polluting wrecks worldwide

**Rusting time bombs**

There are over 8500 potentially polluting wrecks lying on the seabed, nearly 1600 of which are oil tankers. Most of them sank during the second world war.

**KNOWN WRECK SITES**

![Map of the world showing the locations of the wrecks.](image)

- **Exxon Valdez tanker spill 1989**
  - ~40,000 tonnes

- **Deepwater Horizon 2010**
  - ~1.1 million tonnes

**ESTIMATES OF THE OIL REMAINING IN SUNKEN VESSELS**

- 2.5 to 20 million tonnes

**CLEAN-UP COSTS**

- $2300 to $17,000 per tonne
Review:

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“Curiosity is the First Prerequisite”

Wreck of the Dunnottar Castle 1886

History and heritage have a special place in Our Oceans...

Thank you for participating