JPAC’s Underwater Search and Recovery Process

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- JPAC takes *overwater loss cases* and *underwater sites and leads* into consideration as part of the larger search and recovery planning process.

- At present, JPAC typically plans and executes at least two underwater investigation activities and two underwater recovery activities each year. Additional activities occur as situation and funding permit.

- CIL Forensic Anthropologists with training in Underwater Archaeology support the planning process and oversee the scientific aspects of much of the field work.
Worldwide Distribution of Overwater Loss Cases JPAC is Currently Tracking*
Unaccounted-For Individuals by Conflict: Land vs Water Losses*

### Individuals By Conflict

- **TOTAL LOSSES**
  - WWII (73677): 8241 (11.19%) Underwater, 7630 (3.67%) Land
  - Korea (7921): 291 (32.04%) Underwater, 529 (93.5%) Land
  - SEA (1651): 1122 (8%) Underwater, 115 (1%) Land
  - COLD WAR (123): 8 (115) Underwater, 115 (8%) Land

*CHART*
Setting Up an Underwater Program

- Staff (Anthropologists, Dive Planner, Core Dive Team)
- SOPs
- Phased approach (search, survey, and recovery)
- Planning on a mission-specific basis (research design, equipment, team, platform, timeframe)
- Basic in-house capabilities (remote sensing, diving)
- Relationships with other organizations (Navy and Army expeditionary salvage/engineering diving units, EODMUs, NCBs, Navy Underwater Combat Camera, NAVO, MSC, etc.)
Setting Up an Underwater Program

- Coordination with property custodians, land-owners, and/or host-nation governments
- Basic evidence stabilization procedures (desalination)
- Systematic historical research effort (*proactive* versus *reactive*)
- Data management scheme
- Underwater Geographic Information System (UGIS) to manage geospatial data and assist in planning
- Research and development of specific tools more suited to our unique needs
Underwater GIS

Maritime Boundary / Political Jurisdiction Data
Ways of Sorting Information

- Types of Loss Incidents (Nature of Incident, Level of Information available, Level of interest to JPAC)
- Types of Leads (Source of information)
- Types of Sites (Level of Intactness, Nature of the Environment, Complexity of Site)
- Types of Site Formation Processes (Processes at work in how site was formed, processes at work on site following its formation)
Underwater Site Development Process

Historical Loss Incident

Lead on a Site Generated
• Historical research
• Informant-provided

Search Process (Investigation)
• Search Areas are proposed
• Areas are searched
• Targets of Interest are investigated

Site is Encountered
• Survey (Investigation)
• Recovery
Diagnostic Evidence

- Human remains
- Identification media
- Personally worn or carried items
- Aircrew apparel
- Aircraft egress systems
- Escape, evasion, and survival-related items
- In certain cases, selected items that otherwise serve to correlate a site to a specific case (aircraft wreckage with identifying data, etc)
Underwater Investigation: Site Leads
Shore-based or Ship-based Small Boat Team: Lightweight, Short-Distance Range, Portable, Maneuverable, Working Depths 5-100 ft
Underwater Investigation: Platforms

Hydrographic Survey Launches (HSLs) or local watercraft of opportunity: Heavy, Medium-distance, Maneuverable, Depths 20-130 ft
Underwater Investigation: Platforms

T-AGS-60 Class Hydrographic Survey Vessel: Heavy, Long-distance, Low Maneuverability, 130 ft+ depths
Underwater Investigation: Methods and Tools

Side-Scan Sonar: Searching for Acoustic Anomalies
Underwater Investigation: Methods and Tools

Marine Magnetometer: Searching for ferromagnetic anomalies
Multi-beam Echo-sounder: Determining broader area bathymetry and detecting targets of interest
In-water Survey and Target Verification: divers, search patterns, metal detectors, photo/video
In-water Survey and Target Verification: AUVs (UUVs), ROVs
Probing & Sampling: Characterizing and correlating anomalies and deposits
Test Excavations: Target characterization, assessing approximate site size and depth

Underwater Investigation: Methods and Tools
Underwater Recovery: Platforms

Staging Operations from Shore
(Very Shallow Water <30 ft; >50m)
Underwater Recovery: Platforms

Light Surface Supply Air System from Small Craft or Shore (Small Riverine >30 ft; >50m)

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Underwater Recovery: Platforms

Flat-Bottom Barge w/ Surface Supply Dive System and Crane (Shallow Water <100 ft; <10km)
Underwater Recovery: Platforms

T-ARS-50 Class Navy Salvage Vessel
(Deeper Water >100 ft; >10km)
Underwater Recovery: Methods and Tools

Underwater Mapping Methods
(Angle / Distance Measurement, Triangulation, Installed Grid Systems)
Underwater Recovery: Methods and Tools

Underwater Suction Dredge System
Underwater Recovery: Methods and Tools

Wet-screening configurations
Underwater Recovery: Methods and Tools

Lifting Baskets for bringing excavated sediment to screens
THANK YOU