JPAC Underwater Geographic Information System (UGIS)

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JPAC conducts global search, recovery, and laboratory operations to identify unaccounted for Americans from past conflicts in order to support the U.S. Department of Defense’s personnel accounting efforts.

Why create an Underwater GIS?
- Assess, analyze, identify and manage underwater military losses and archaeological site information.
- Determine the environmental feasibility of conducting underwater investigation and recovery activities.
- Prioritize investigation and recovery efforts in order to achieve the best possible accounting results.
- Deliver mission planning and post-mission reports and map products.
- Access and distribute geographic information to JPAC sections, and investigation/recovery teams in the laboratory and/or field.
- Preservation and loss prevention of historical information and knowledge, including storage and warehousing of underwater investigation survey and recovery data.

Contribute to UGIS!
JPAC seeks the support and cooperation of Asia-Pacific nations, underwater cultural heritage specialists and the regional diving community to assist with the inventory and protection of U.S. military archaeological sites under water through the sharing of national or regional archaeological inventory data. Please contact us to support our mission.

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Phase 1: Inventory
A primary goal of UGIS is to develop a comprehensive inventory of all underwater U.S. military losses including aircraft and ships from World War II, Korean War, Vietnam War and Cold War for the entire Asia-Pacific region. Inventory and environmental data are used to quickly access and identify geospatial information pertaining to U.S. military losses in marine, lacustrine, riverine, estuarine, and aquaculture environments. These data are digitally warehoused in UGIS and used to support JPAC underwater investigation and recovery missions.

Phase 2: Analysis
UGIS provides a composite map or layers of historical, remote sensing, environmental, and political geo-spatial features that can be used to assist in the planning, management and recovery of U.S. missing persons from past conflicts. Vector data sets developed in UGIS include:
- Locations: features derived from historical records such as witness observations and aerial photographs.
- Targets: features derived primarily from remote sensing survey operations.
- Areas: survey or recovery areas proposed for investigation or recovery operations based on locations, targets, and other environmental (e.g., bathymetry, sediments) and political information (e.g., marine boundaries).

Phase 3: Recovery
Planning
Investigation
Excavation
Identification
Closure

Currently, JPAC’s underwater archaeology team conducts three investigations (or surveys) and three recoveries (or excavations) around the world each year. Factors such as weather, terrain, site accessibility, and the location and nature of targets or anomalies as identified in remote sensing surveys, and historical documentation influence how and when JPAC teams deploy to each specific site.

Underwater investigation teams (UIT) utilize a variety of tools and methodologies to locate and correlate crash sites with specific site incidents and unaccounted for individuals. These include remote sensing (such as side-scan sonar, multibeam sonar, and magnetoater), evidence interviews, and dive ground-truthing. If enough evidence is found, a site is then recommended for recovery.

Underwater excavations and recovery teams (ERT) are directed by a JPAC underwater archaeologist. The recovery teams consist of specialized U.S. military personnel including Navy/Air Force divers, combat photographers, special operations forces team members, medical support staff. Recoveries are conducted according to the American Society of Crime Laboratory Directors – Laboratory Accrediting Board (ASCLD-LAB) crime-scene standards.

Human remains and material evidence recovered from the field is returned to JPAC’s Central Identification Laboratory (CIL) in Hawaii, where they undergo analyses. Positive identifications are formulated on the basis of forensic anthropology, radiological examinations, and dental analysis, mitochondrial DNA (mtDNA), and associated material evidence.

The final outcome, and the goal of every JPAC mission, is the repatriation and transfer of accounted-for remains and associated personal items to a family’s surviving family members. More than 120,000 Americans have been identified and repatriated through efforts undertaken by JPAC and its predecessors since accounting efforts began in the 1970s.

Distribution of U.S. Military Aircraft Losses in Asia-Pacific Region

Underwater Loss Incidents (by Country)

Underwater Casualties (by Country)

Composite map of UGIS data sets include base maps such as nautical charts, base incident locations recorded in a legacy database system, targets or anomalies as identified in remote sensing surveys, and historical observations. Based on analysis of the combined data, JPAC plans investigation and recovery operations.