

Dual-Use Seabed Mapping: China's Oceanographic Survey Fleet and the U.S. Undersea Advantage in the Western Pacific

Phillip Johnson | July 2026



NATIONAL SECURITY
DATA AND POLICY
INSTITUTE

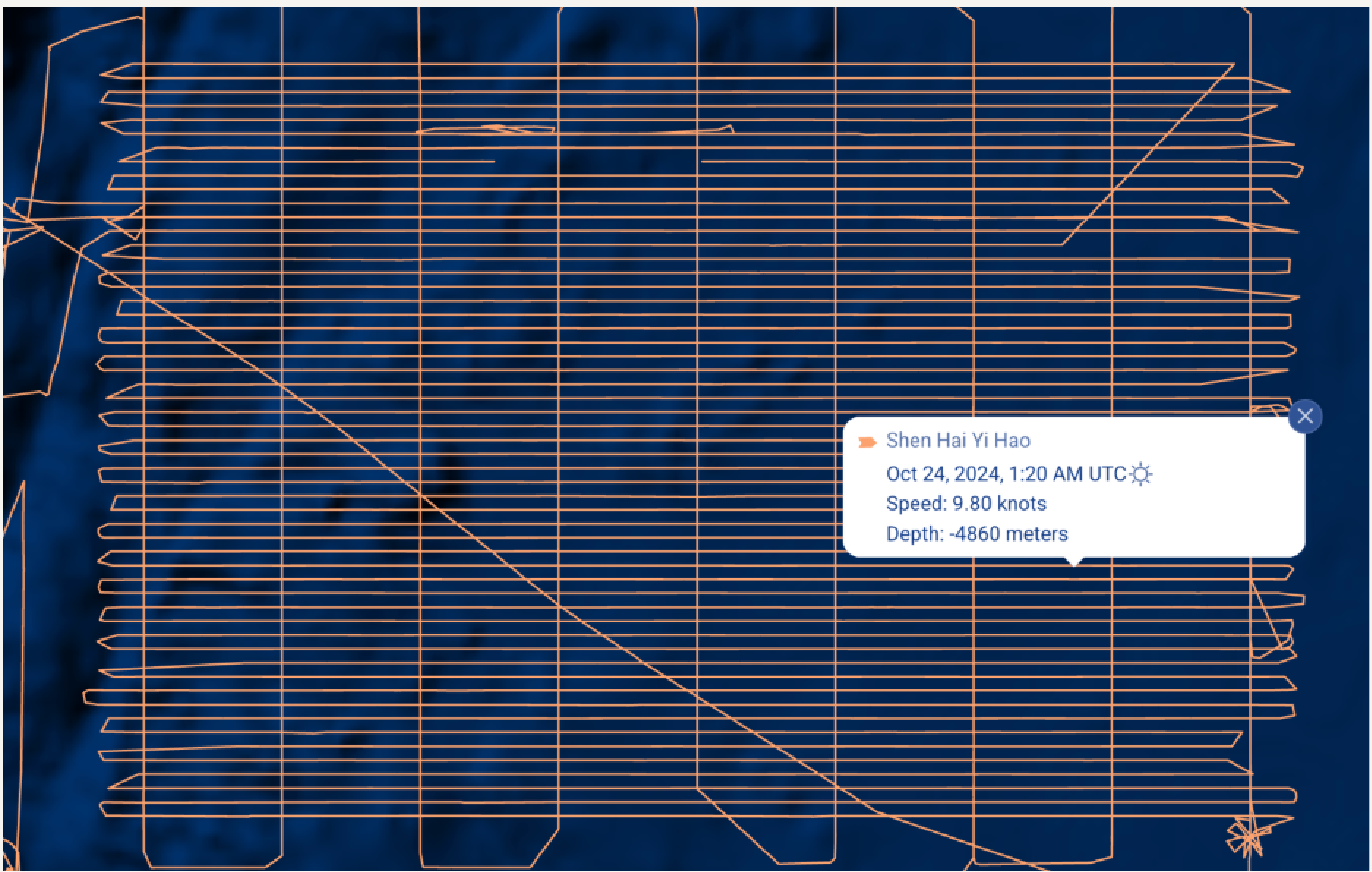
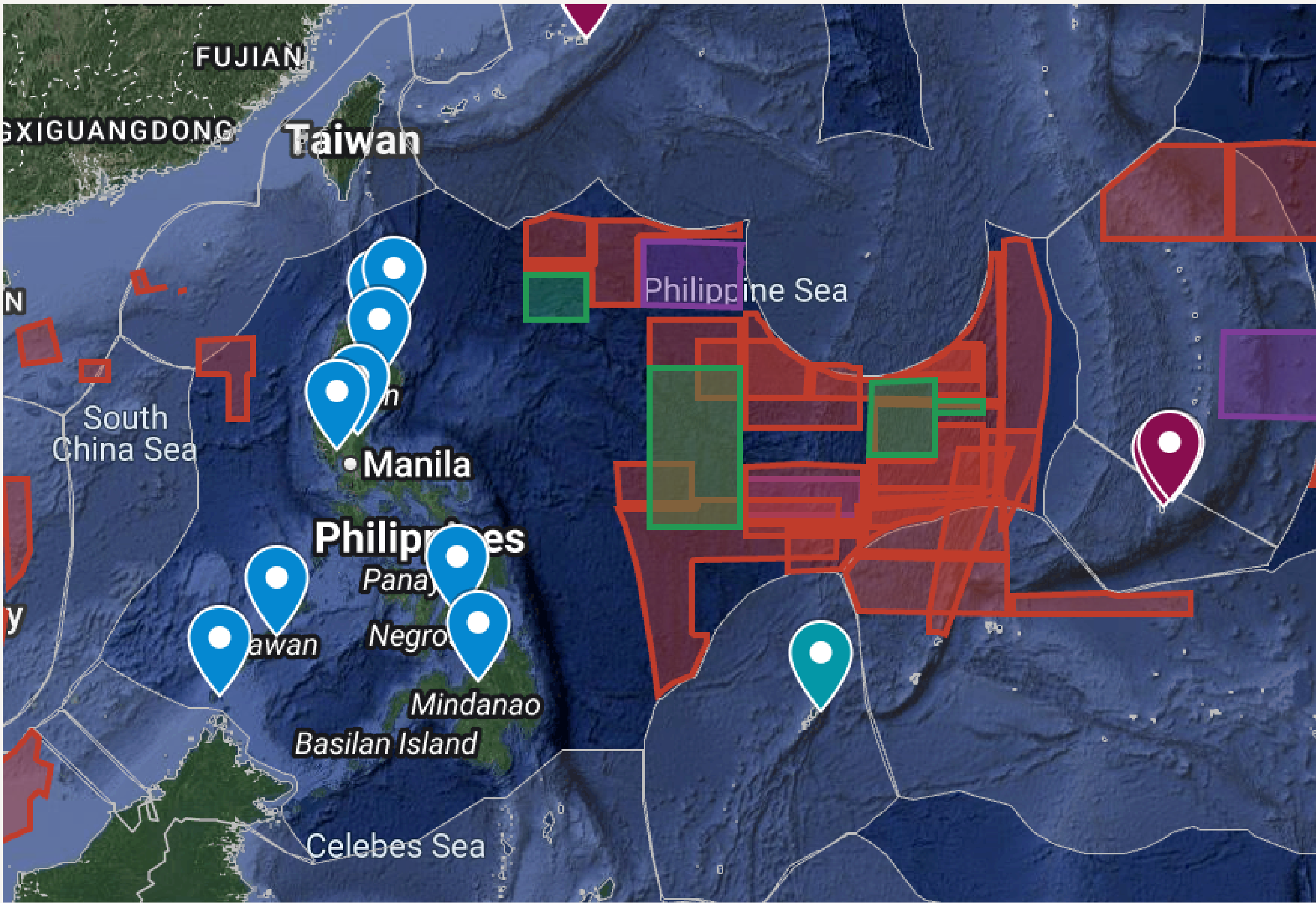


Problem Statement

The People's Republic of China's National Oceanographic Survey Fleet conducts extensive seabed mapping within the First Island Chain and within and just beyond the Second Island Chain. In addition to supporting civilian scientific objectives, the data from this research also serves dual-use military objectives affecting undersea warfare capabilities for both China and the United States. In a highly contested region with significant potential for crises and conflict, the erosion of the U.S. undersea advantage carries outsized operational and strategic consequences.

The Oceanographic Fleet

- The fleet is the largest in the world, outnumbering the combined U.S. Academic Research Fleet, the National Oceanic and Atmospheric Administration's research fleet, and the U.S. Navy's fleet of oceanographic survey vessels.
- Instruments and sensors collect data on bathymetry, bottom composition, water-column temperature and salinity, the speed and direction of undersea currents, acoustics, and sound propagation.
- Owners within the fleet, mainly the Ministry of Natural Resources, which oversees coordination, have close ties with the PLAN, especially in the context of the Chinese Military-Civil Fusion
- 18 of 54 research vessels have participated in bathymetric surveys since 2012.



Shenhai 1 mapping pattern in the Philippine Sea. A tight back-and-forth pattern and speed between 8–10 kn indicate seabed mapping.

The Military Value of Mapping

- Strengthens undersea warfare by improving submarine and UUV navigation, sonar modeling, and detection of adversary undersea operations.
- Supports China's growing seabed sensing network and AI-enabled detection systems, helping erode the U.S. submarine stealth advantage in key strategic waters.
- Mapping in the Philippine Sea and around Guam helps the PLAN understand future operating environments and supports its ambitions to project submarine power beyond the First Island Chain.

U.S. Takeaways

1. **Seabed mapping within and just outside the First and Second Island Chains is dual-use, contributing to PLAN detection and defense and force projection.** The data likely supports China's maturing ASW and A2/AD systems while enabling the PLAN's ambition to "break out" beyond the First Island Chain.
2. **Actions advancing Chinese subsurface capabilities erode the U.S. asymmetric subsurface advantage.** Narrowing the stealth margin of U.S. submarines in key strategic areas makes submarine operations more difficult to conduct and increases operational risk.
3. **Operational constraints on U.S. submarines harm the credibility of U.S. conventional deterrence in the region.** With increased risks and costs, the credibility of a U.S. intervention in a crisis, such as a Taiwan contingency, is diminished. Subsequent effects include an emboldened China and regional allies and partners who may draw closer to China for their own security.