The Submarine's ability to prepare and control the battlespace will be vital to successful 21st century naval warfare.

- **Summary**

- **Discussion**

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**Submarine Capabilities and Contributions Summary**

- **Submarine mission agility and dominance.** Warfare in the 21st century will witness the ascendancy of submarines in battlespace preparation, command of the seas, and land attack roles. *(See submarine operations paper for specific mission discussions.)*

- **Emerging, asymmetric threats in the littorals.** Current and future regional powers will utilize inexpensive, asymmetric weapons that are readily available on the open market to threaten our Navy’s ability to gain access to littoral regions to project power ashore. These asymmetric weapons systems include quiet submarines, mines, tactical ballistic missiles, anti-ship cruise missiles, information warfare technology, and chemical and biological weapons of mass destruction.

- **Vulnerability of non-stealthy platforms.** The combination of space based surveillance systems, long range precision strike weapons and robust command and control networks will enable 21st century regional powers to target non-stealthy platforms in the littoral regions.
Submarine stealth and survivability. Stealth, mission agility, and endurance (including minimal logistic support requirements) make submarines ideally suited to operate and survive in hostile, forward-deployed areas across the spectrum of peace and conflict.

Assured access. The submarine’s unique ability to penetrate and operate in denied areas with virtual impunity while detecting and destroying advanced threats will be a critical enabler to ensure our Navy can fight and win in the littorals.

Knowledge superiority. Submarines provide critical information for our national leadership, intelligence communities, and theater commanders. Because submarines provide undetected, non-provocative presence, highly capable sensors, and long dwell time, they are able to provide information other systems or platforms cannot obtain. (See submarine operations paper for discussion of ISR mission.)

Supporting joint operations. Often "first in and last out," a submarine’s ability to gain and sustain access, collect vital information, and provide early combat-credible forces—thus shaping and preparing the battlespace—plays a key role in enabling joint forces.

Discussion: Submarine Capabilities and Contribution in 21st Century "Gaining and Sustaining Assured Access in Denied Areas"

Numerous independent analytical studies conclude that 21st century naval warfare will be marked by the use of asymmetrical means to counter a U.S. Navy whose doctrine and force structure enable robust power projection ashore from the littorals. Asymmetric warfare implies that potential adversaries will use easily acquired weapons systems that exploit perceived weaknesses in our doctrine or capabilities. In particular, the marriage of space based reconnaissance and precision strike weapons to build a robust area denial capability, will make non-stealthy platforms increasingly vulnerable to attack and destruction near the world’s littorals.

There are two key trends related to this combination of long-range reconnaissance and strike. First, sensors, including space based and airborne sensors, are increasingly able to detect and target objects at long range. Secondly, precision guided munitions, such as supersonic cruise missiles and tactical ballistic missiles (TBM), ensure much higher probabilities of a kill once a platform is detected. These two trends are likely to continue, with future cruise missiles and TBM becoming faster, stealthier, longer ranged and increasingly deadly against non-stealthy targets. Both missile types are difficult to defeat defensively once launched. Moreover, a regional adversary could arm either missile type with
chemical and biological weapons of mass destruction (WMD) to further complicate defensive measures.

An additional trend is the increasing proliferation and commercial access to technology formerly developed and deployed exclusively by major powers. A robust international arms market has made it possible for a regional power to acquire large numbers of relatively low-cost cruise missiles and tactical ballistic missiles for a modest investment\(^3\). Regional powers also have increasing access to commercial satellites capable of providing the necessary communication, command and control network as well as a detection capability that enables targeting ships at sea. The 24 September 1999 launch of the first commercial satellite with 1-meter resolution imaging capability denotes a new milestone in this trend of increased military utility of commercial space assets. Over the next ten years more than 30 commercial-or government-sponsored imaging satellites are planned for launch.

Regional powers and future peer competitors can acquire other powerful asymmetric means to build a credible anti-access or area denial capability and delay or reduce naval access to the littorals. These include submarines, mines and information warfare technology. Countries have access to these weapons systems today; all remain difficult to counter. All have the potential to delay or reduce our Navy’s ability to project power from the sea.

The U.S. Navy must prepare for the ability of regional powers or peer competitors to construct a robust area denial capability. The submarine’s ability to gain and sustain access by penetrating a denied area, independently, covertly, and for long duration, provides a unique tactical advantage over other assets in the Navy inventory. Virtually invulnerable to cruise and tactical ballistic missiles as well as weapons of mass destruction and information warfare, submarines provide
U.S. operational commanders the critical tools they need to prepare and shape the battlespace to ensure the defeat of the advanced area denial threat. U.S. submarines operating undetected near the enemy coastline provide a complete picture of the undersea, surface and near shore environment and enemy force dispositions and preparations. The can carry out these missions for extended periods of time with virtually no logistic support requirements. In this role, submarines mitigate the risk and enable the effective employment of the full force of our naval power against the adversary. As such, submarines are an increasingly important element of our nation's military.

Employing currently available onboard imagery and SIGINT equipment—and specially equipped unmanned undersea vehicles (UUVs) and unmanned airborne vehicles (UAVs) in the future—the submarine can gather intelligence information that no other national asset can duplicate. The submarine's ability to map the undersea environment with onboard sensors and UUVs furnishes our operational commanders with a complete picture of the undersea battlespace, providing them with the location of mines and enemy submarines and, as importantly, negative information - where they are NOT. Submarines have become essential to the operational commander's ability, in peacetime and in conflict, to achieve better battlespace awareness and ultimately knowledge superiority.

Should conditions escalate and hostilities be required, submarines can destroy targets from denied areas while providing little or no warning to the enemy, using the strike capability resident in Tomahawk as well as the unique ability of the submarine to covertly insert Special Forces. The ability to conduct no-notice strikes from close-in with survivable platforms improves the kill probability with less risk to U.S. forces. Preparatory strikes from submarines can therefore reduce or destroy an enemy's area denial capability and allow entry of less stealthy forces.

Submarines will continue to dominate the undersea environment and contribute to command of the seas. Our quiet submarines with superior sensors are still the best resource to counter the threat posed by the growing number of quiet diesel submarines being employed by regional powers. Likewise, submarines with organic, stand-off Mine Counter Measure (MCM) systems (such as the Long-Term Mine Reconnaissance System—LMRS) will provide operational commanders with a covert and survivable capability for counter and wage mine warfare.

The submarine's inherent stealth, speed, and endurance, combined with its ability to conduct a variety of operations (mission agility) in hostile and littoral regions, will be critically important to preparing and controlling the joint battlespace in 21st century warfare.

Studies ("Precision Strike from the Sea" and Antisubmarine Warfare after the Cold War), and the Commission to Assess the Ballistic Missile Threat to the United States.

2. Defense Science Board, *Investments for 21st Century Military Superiority*, specifically addresses concern of long range precision strike weapons, advanced Intelligence, Reconnaissance, Surveillance, Target Acquisition (IRSTA) capabilities and robust C3 networks providing the ability to target both fixed and mobile targets.