Advancing Beyond the Beach: Amphibious Operations in an Era of Precision Weapons

Bryan Clark and Jesse Sloman

CSBA
Center for Strategic and Budgetary Assessments
## Study methodology

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<td>Win the war at sea</td>
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<td>Cooperative efforts with allies and partners</td>
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<td>Maintain security</td>
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**Amphibious force structure**

- Ships
- Connectors
- Packages
- Basing
- Readiness model

**Number and type of force structure**
Contested areas make “rollback” challenging

NOTE: Range arcs are illustrative of possible threats rather than an actual force laydown.
New deterrence approaches needed

• Today’s force designed to deter by compellence after the fact
  – Adversary commits aggression; U.S. surges forces to reverse gains
  – Requires months of force flow before “roll back” begins
  – E.g., Iraq (X2); notional plans for DPRK and Iran

• Threatening a response after aggression is no longer effective
  – China, Russia, and Iran can rapidly achieve likely objectives
  – Anti-access capabilities preclude traditional build-up

• Future deterrence approach should include two elements:
  – Deny or delay aggression: With survivable, forward postured forces
  – Punishment: Impose costs immediately to compel aggression to stop

Future deployed forces need to focus on deterrence through denial and punishment of an adversary’s aggression
Iranian ASCMs can threaten entire Gulf

**Iranian Ground-Launched Anti-Ship Missile Systems**

<table>
<thead>
<tr>
<th>System Family</th>
<th>System Designation</th>
<th>Export Designation</th>
<th>IOC</th>
<th>Range (nm)</th>
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<td>Karas</td>
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**Chinese Ground-Launched Anti-Ship Missile Systems**

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<th>System Family</th>
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<th>Range (nm)</th>
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<td>C-602</td>
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<td>P-270 Moski</td>
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<td>DF-21D</td>
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New platforms designed to increase reach

- Operational Maneuver From the Sea for amphibious ops at long ranges
  - For Distributed Operations (DO)
  - To reduce threat from ASCMs

- Ship to Objective Maneuver
  - To reduce time of beach transition
  - Use vertical lift, new vehicle

- Major shortfalls
  - Not enough F-35Bs to support DO
  - One vehicle able to fit on MV-22
Surface connectors vulnerable or slow

- Surface connectors needed for mobility, fires
  - Armored HMMV or JLTV
  - HIMARS, M777

- Landing Craft (Air Cushioned) – LCAC
  - Large payload
  - Relatively fast (40 kts); 300 nm range
  - Identifiable; lacks self defense

- Landing Craft (Utility) - LCU
  - Larger payload than LCAC
  - Slow (10 kts); 1200 nm range
  - Could blend into coastal shipping
Fires need same reach as troops

- 1200 nm, TACTOM range
- 450 nm, F-35B combat radius
- 400 nm, MV-22 combat radius
- 300 nm, LRASAM range
- 125 nm, AH-1Z combat radius
- 110 nm, AH-64D combat radius
New Concepts
EABs can support a range of applications:

- EPF deliver aviation fuel and support equipment
- Amphibs serve as mobile logistics hubs
- Ship magazines deepen fires capacity
- MV-22s and UAV resupply
- Small UAVs for OTH targeting
- LCACs bring in HIMARS and IFPC
- MV-22s deliver troops to establish lodgment
- Sustain FARPs
- Runway
- Refueling area
- Maintenance area
- Small UAVs for OTH targeting
- EPF deliver aviation fuel and support equipment
- Direction of aggressor forces
Defend EABs by increasing req’d salvo size

28 weapons required to exceed defensive capacity – for every target
Could result in hundreds of weapons needed to defeat a single EAB
New air defenses increase defensive capacity

- Indirect Fires Protection Capability (IFPC)
  - Inc 2-I w/ AIM-9X or Lower AD
  - Inc 3 with laser or HP RF weapons

- M777 w/ hypervelocity projectiles (HVP)
  - Requires Sentinel radar
  - Each can engage 1 weapon per salvo

- Defensive systems increase number of weapons required per target
• EABs can be harder to defeat than ships
  – Can exploit terrain and foliage
  – Have many discrete targets
  – Easier to harden and reconstitute

• Passive defenses can help defend EABs
  – Do not need to be perfect
  – Only need decoy system to look like camouflaged real system
  – Increases number of targets to engage
EABs supported organically or by host nation

Defensive battery includes:
- 2 M777A
- 1 IFPC Inc 2-I
- 1 IFPC Inc 3 w/laser, HPRF

1-2 MV-22 flights per day could support the EAB; with FARP, an additional MV-22 flight could resupply fuel bladder
Cross-domain fires create barrier to enemy
Blockade key to protracted conflict

- Commandeer suspected red ships
- Quarantine area
- Onshore inspections
- Small boats/LCUs for inspections
- Helicopters patrol area, identify and help board ships with patrol boats
Amphibious raids to defeat threats to access

- MV-22s from LPD/LXR deploy troops
- F-35Bs launched from LHA
- TACAIR suppresses IADS
- Unmanned vehicles jam air defense radars
- Unmanned vehicles act as decoys to confuse air defenses
Amphibious forces can support SUW

- Attack helicopters from ARG engage fast attack craft
- TERN UAVs provide targeting
- F-35Bs engage surface combatants
- LRASM
- SM-6
- Amphibious forces can support SUW
New amphibious posture to deny and punish

- Mediterranean / Black Sea: 3
- Persian Gulf: 2
- East China Sea: 2
- Western Pacific Ocean: 2
- West Indian Ocean: 3
- South China Sea: 3
- Total Amphibious Presence:
  - LHA: 2
  - Small-Deck Amphib: 8
Capability Implications
Lighter vehicles can increase range & firepower

- Marine vehicle weight has increased
  - IED threat in Iraq and Afghanistan
  - New vehicle acquisitions

- MV-22-compatible vehicles increase MAGTF’s ability to project power at long-range
  - Internally Transportable Vehicle (ITV) and Expeditionary Fire Support System (EFSS)

- DARPA GXV-T program
Connectors optimized for ocean travel

- “EFV-like” system no longer useful
  - 25 nm prohibitively close

- Surface connectors should be optimized for ocean transit rather than to fight on land
  - Quicker transit times
  - Ground vehicles without amphibious design tradeoffs

- EPF and UHAC both provide speed/range to MAGTF
Missiles increase MAGTF’s long-range fires

- Distributed ops will require fire support over long ranges
  - RIMPAC 2014 warfighting experiment
- Missile launchers with multi-mode weapons
  - Reduce logistical challenges
  - Maximize limited magazine space
- Long-endurance UAVs provide organic over-the-horizon detection capability
Missiles can support distributed ops
Increase amphibious ship armament

- Current amphibious ships lack offensive and defensive capability
  - Cannot participate in Distributed Lethality
  - Require escort when air threat present

- LPD-17 hull has sufficient space to support VLS

- Long-endurance UAVs and NIFC-CA will improve the reach of VLS-equipped amphibious ships
Rebalance amphibious loadouts to aviation

- *America*-class Flight 0 ships add aviation capacity compared to LHDs
  - 40 percent more hangar space
  - Double cargo fuel payload

- Aviation-optimized LHAs will improve ARG’s long-range striking power
  - 20+ F-35s linked via NIFC-CA to air and surface assets

- DoD should develop a CATOBAR variant to act as a light aircraft carrier (CVL)
Four-ship ARG increases capacity

ARG Storage Comparison (ft³ or ft²)

- Cargo Cube (Net)
  - 3-Ship ARG
  - 4-Ship ARG

- Vehicle Square (Net)
**Four-ship ARG increases fires**

**Current ARG:** 6x AV-8B, 12x MV-22, 3x UH-1, 4x AH-1, 4x CH-53

**Four-Ship ARG Strike Optimized:** 20x AV-8B/F-35B, 4x MV-22, 3x UH-1, 4x AH-1, 4x CH-53

**Four-Ship ARG Fast Assault Optimized:** 10x AV-8B/F-35B, 12x MV-22, 7x CH-53, 2 K-MAX
STOVL fighter mission inventory will increase

2016
84x AV-8B (6 x VMA)
21x F-35B (1 x VMFA)

2030s
194x F-35B (14 x VMFA)
New readiness cycle will enable more presence

Current amphibious forces readiness cycle
- Deployment
- Sustainment
- Maintenance
- Basic Training
- Integrated Training

27 Months

Proposed amphibious force readiness cycle
- Deployment
- Maintenance
- Training

12 Months
Amphibious fleet should expand

![Graph showing the number of small deck amphibious ships from 2019 to 2046. The graph includes the proposed requirement of 29 ships. The PB17 and alternate shipbuilding plans are also shown.]