Shaping the Future of ISR

Accepting and capitalizing on emerging technology

by Maj Troy E. Mitchell

>Dr. Mitchell has served in the Marine Corps since 1999 and has a doctorate in strategic security. He currently serves as an Exchange Officer to the Australian Defence Force as the J-2 (Intelligence) to the amphibious task group. Maj Mitchell has served on multiple MEUs as a Reconnaissance and Intelligence Officer.

Single UASs will be part of ISR operations. (Photo by LCpl Jesus Sepulveda Torres.)

Globally, the power of government is weakening with the rise of the middle class. Moving beyond basic needs, they increasingly crave governmental transparency and accountability. When the middle class places increasing demands on their government, however, they become more restless.[1] If fragile states fail to address issues of accountability, it is unlikely that peace agreements will sustain the state. Competition between powerful states increasingly lends a regional or international color to civil wars, rendering their resolution complicated.[2] Thus, the world observes a resurgence of nationalism, with governments displaying short-term national agendas and shifting toward populist behavior while appealing for legitimacy.[3]

The international community continues to accept imperfect peace processes that accompany failed transitions. In a failing global society, weakened and corrupt states set the stage for internal wars with external enablers demonstrating a lack of capacity, leaving their political will open to question.[4] The resolution of fragile states' systems takes time. The World Bank Development Report stated it takes 17 years on average to navigate from war to a peace agreement that includes sustainable institutions and order. In 20 of the fastest-moving countries, it took an average of 17 years to draw the military out of politics, 20 years to achieve functioning bureaucratic quality, and 27 years to bring corruption under reasonable control.[5]

Wars and instability are becoming more geographically concentrated, compounded by a concerning tendency toward violence in countries transitioning toward democracy. Some of the world's most troubling countries are those attempting to transition away from authoritarian rules. Transitioning governments pose dilemmas for domestic and foreign powers.

Weber defines the state as an entity that has a monopoly on the legitimate use of violence in a territory.[6] Conflict areas, however, characteristically portray states losing the support of their constituents. In this context, alternative forms of power, control, and coercion develop to fill the void. Nowhere is this void more visible than at the margins of the state, where warlords and non-state armed groups principally operate.[7] They derive power from their position at the frontiers where states have difficulty extending power. Although they may attack the heart of the state, their source of power remains at the periphery.

All forms of political violence and warfare are social processes and symptomatic of advanced systemic breakdown and societal disintegration based on the injection of a multitude of factors, effectively altering the status quo. In this

sense, ethnic violence is the most insidious form of intra-state political conflict. Ethnic violence presupposes a breakdown in authority structures required to impose measures of control against violence, retains minimal organization and coordination to invoke high levels of mechanized warfare, and characterizes the nature of the conflict in evocative, symbolic terms that are intrinsically non-negotiable.[8] Ethnic conflict is especially volatile when ethnic identities coincide with religious identities.

Stateless groups present a greater threat than nation states because extremists wield weapons and mount assaults that many countries would not dare to attempt. Meanwhile, trends in technology shape the rise of stateless power. Computers, the Internet, cellular and satellite telephones, and satellite television allow extremists unprecedented access to one another. This connectedness enables extremists throughout the globe to organize themselves more efficiently than ever before. Extremist groups assemble C^2 (command and control) structures that previously would have been orchestrated only by wealthy nation states.

The future of warfare lies in streets, sewers, high-rise buildings, industrial parks, and the sprawl of houses, shacks, and shelters that form the broken cities of the world. These "mega-slums" house millions of young, urban poor, where the losers of globalization and stateless warriors are concentrated together in shanties and high-rises. Adding fuel to the fire are the diverse religious, ethnic, and political movements competing for the souls of the urban poor, which serve as volcanoes waiting to erupt.

ISR in 2050

The future of ISR (intelligence, surveillance, and reconnaissance) enables a joint, amphibious environment capable of projecting power in the littoral environments against near-peer competitors while supporting national interests as conflicts arise. Whether the conflicts are among the mega-slums described or under the auspice of a hybrid, A2/AD (anti-access/area denial) system, the concepts described serve as enabling actions to support the commander's de-

cision by increasing the applicability of intelligence-driven operations.

ISR Airbasing

As the ARG/MEU remains outside of the near-peer or adversarial system's threat radius, they possess an increased aviation capacity and capability via an airbased platform mirroring the sustainability of an airship. An airship is a type of aerostat or lighter-than-air aircraft that can navigate through the air under its power. Aerostats gain their lift from large gasbags filled with a lifting gas that is less dense than the surrounding air. Internal to the airship are the nuanced maintainers for the UAS (unmanned

---

If fragile states fail to address issues of accountability, it is unlikely that peace agreements will sustain the state.

---

aircraft systems) aircraft and armed ISR assets, increased C^2 enablers to support the ARG, aviation strike components, and reconnaissance enablers intended to shape the battlespace. The purpose of the ISR airbase is to reside outside of the threat envelope of the adversarial systems capability and enable intelligence capabilities to support the ARG, which set the conditions for targeting systems impeding access for the ARG to maneuver into an adequate operations box, allowing the amphibious force to commence their maneuver ashore. Alongside the center of the airbasing apparatus is a runway to launch and recover UASs and ISR assets to continue to sustain operations and enable targeting to attrite the adversary or provide the necessary effect to enable the ground scheme of maneuver. The runway supports limited rotary-wing aviation capability to insert no more than two infantry reinforced companies. Airbasing allows the commander to bypass obstacles inhibiting the maneuver element to obtain sur-

prise, speed, and tempo. Meanwhile, airbasing provides a top-down raid capability pending the objective.

The initial find phase for shaping operations to commence against the adversaries' system is launching swarms of UASs with an armed asset in support of their aviation targeting. They might act as a "cloud," arriving from various directions. As Clausewitz described such tactics in guerrilla campaigns, the systems would become "a dark and menacing cloud out of which a bolt of lightning may strike at any time."[9] Or the swarm might work as a "vapor," covering a wide area, but never fully congeal in one place. The systems may fix on the target at once to overload the defense of the target. Or they may pulse the target, attacking, dispersing, and re-attacking again and again, aiming to wear the defenses down. "They [the adversary oriented towards the UASs] will feel like they are always watched, that they face a non-human foe that is relentless."[10]

Based on the effect desired, the micro UASs may designate a target for prosecution (finish), continue to loiter and provide information, or provide SIGINT (signals intelligence) payload options to obtain atmospherics. If the targeting cycle of the MEU staff enables prioritization of targets at a precise time for strikes, the micro-UASs cue armed assets to prosecute the nominated strike package, providing opportunities for escort platforms to transit into their fire support areas for naval gunfire support. As high-priority targets are prosecuted or before targeted strikes, reconnaissance enablers launch from the air or seabase via lightweight, all-weather, jet-pack/belt devices supporting small elements of Marines to quickly perform a specialize high-altitude insertion in a contested and convoluted operating environment without audible compromise. The jet-pack/belt devices possess logistical sustainment mediums to support the team as well as GPS locator beacons to initiate a quick response force or personnel recovery actions pending the ability to camouflage their digital signature in a highly-technological environment if compromised. Meanwhile, the low-visibility teams have a one-eyed monocular affixed to a lightweight helmet

adaptor, providing a personalized UAS asset to each Marine to answer specific information requirements for the commander. This capability increases force protection for the reconnaissance element while providing full-motion video and SIGINT capabilities to the MEU afloat. As the GCE commander's staff formulates a maneuver plan, the personalized UASs insert into buildings, sewers, streets, caves, etc. to answer requests for information. Additionally, the teams possess iDevices that enable applications to upload various reports to either the air or seabase.

ISR Seabasing

Either synchronized with the airbase's efforts or as an additional phase, stage, or part, the amphibious readiness shipping commences well deck operations to enable the submerged reconnaissance vessel to initiate their movement by securing the beachhead, allowing the MEU to seize respective objectives. The vessel's attributes encompass a troop compartment for up to six personnel, a dive chamber for diving operations, a limited self-defense capability for subsurface and surface attacks, and a compartment to launch and recover hybrid water and surface UASs. Once the craft enters the water and begins the movement toward the defined beach, the waterborne UASs launch to begin their hydrographic and mine survey, enabling force protection of the ARG. The UASs increase the ELINT (electronics intelligence) capabilities of the ARG/MEU and enable increased accuracy of the beach gradients and obstructions prior to initiating the dive team's operations. Once the UASs provide a level of fidelity relating to the subsurface operating environment, the divers commence their operation to begin securing the beach. As the divers break the surface of the water, their personal UAS broaches above the surface of the water based on timing to serve as the forward element of the intelligence operation. Again, the UAS reports to the Marine through his monocular or goggle. The UAS provides full-motion video and SIGINT capabilities to build the intelligence system for the commander. As the airbased and

Handling and sorting information from UAS operations will become more critical to the situational awareness of the commander and his staff. (Photo by LCpl Jose Villalobosrocha.)

seabased UASs navigate the various terrain, they obtain MASINT (measurement and signature intelligence) data of atmospherics, which may hinder the echelon of combat power ashore in contested environments. Throughout the operation, the submerged vessel ensures the boat passage lanes are cleared of

> ## *Stateless groups present a greater threat than nation states ...*

a mine threat. Finally, the submerged vessel supports extracting the team in the event of compromise with increased sustainment and firepower.

As information is fed by the UASs and reconnaissance Marines, data transmits to the landing force operations center and joint intelligence center to continue to increase the situational awareness of the blue-green team. The information resides in a database management server. The hydrographic information uploads itself into the GEOINT (geospatial intelligence) detachment's systems to create and plot images, charts, and maps to continue

planning during the shaping phases. Meanwhile, the ELINT and SIGINT data produced downlinks while pairing with NSA (National Security Agency) databases.

Joint Intelligence Center

In both the airbased and seabased ships, there is a JIC (joint intelligence center), although the primary JIC is aboard ARG shipping, collocated with the MEU commander. Within each of the JICs, GEOINT enablers upload the MEU's direct support satellite imagery of the target area, as well as the imagery provided from the UASs via an increased bandwidth capability via the global broadcasting system. In their respective modular production systems, the GEOINT detachments can task the various UASs to obtain vantage points hindered from the weather, shadowing effects, or other obstacles to provide an all-source intelligence product. Meanwhile, the tasking incorporates specific orders and requests to obtain obstruction heights impeding access into landing zones, dimensions of target objective information, and confirmatory reporting on potential descriptors identified by the analysts. Once completed, the GEOINT detachments have three-dimensional printing capabilities to print the operating environment

in support of wargamming, rehearsal of concept drills, and orders delivery. The GEOINT detachment provides a three-dimensional virtual model to depict the rifleman's movement and slant angles from the insertion point through their seizure of the objective. The increased situational awareness supports the rifle companies continuing to "walk the battlespace" similar to today's popular video games for rehearsals and confirmation of execution checklist items, which mitigate risks and exercise repetitions that increase mission success.

Furthermore, within a Wi-Fi amphibious shipping environment, the intelligence analysts utilize a Flipboard-like iOS/Android application to provide instantaneous open-source products to their iDevice. Flipboard applications provide intelligence analysts a tailorable media and periodical interface with information based on specified parameters of interested operational environment

topics. The iDevice are approved media outlets that pair with SIPR (secure Internet Protocol router) and JWICS (joint worldwide intelligence communications system) terminals to provide open source media capabilities into classified briefings. The paired and authorized devices provide pictures, movies, perspectives, networks, and articles to augment or cue assets to identify triggers leading to instability or employment of the amphibious force.

Finally, within the intelligence analysts advanced analytics computer systems, the analyst possesses a headset terminal with a Siri-like interface to communicate. The interface has advanced foundational analytical information of the operating environment allowing the intelligence analyst to have a conversation with pictures, movies, and other data to increase the aptitude of the analysts to provide a deeper, more scientific analytical product driven analysis. The user interface improves

the efficiency and effectiveness of the intelligence Marine to digest a plethora of information into a useable form for production and dissemination.

Conclusion

The ability to accept and capitalize on emerging technology will be a determinant of success in future armed conflict. Advancing technological shifts enabling intelligence enterprises to drive amphibious operations reduces casualties by mitigating the risk to force, increasing the commander's situational awareness in a usable and digestible form to support accomplishing the mission. In enabling intelligence solutions, the technological revolution forces us to reexamine what is possible and probable based on the future operating environment. Although some of the ideas proposed may challenge contemporary thinking, the purpose remains to instill future acquisition options enabling future operational intelligence concepts to continue to drive military operations.

Notes

1. Council on Foreign Relations (Producer), *What to Worry About in 2015,* (Washington, DC: Audio podcast, January 2015), available at http://www.cfr.org/.

2. J.M. Guehenno, "10 Wars to Watch in 2015," *Foreign Policy*, (Washington, DC: January 2015), available at http://foreignpolicy.com.

3. Council on Foreign Relations.

4. Ibid.

5. World Bank, *World Development Report: Conflict, Security, and Development*, (Washington DC: International Bank for Reconstruction and Development, 2011).

6. M. Weber, *Politics as a Vocation*, (Indianapolis, IN: Hackett Press, 1965).

7. Ibid.

8. Ibid.

9. P.W. Singer, *Wired for War: The Robotics Revolution and Conflict in the 21st Century*, (New York: Penguin Books, 2009).
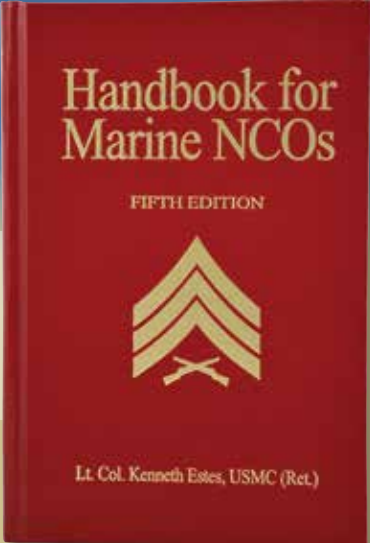
10. Ibid.