

CROSSING THE RED LINE

**SOCIAL MEDIA AND SOCIAL NETWORK ANALYSIS
FOR UNCONVENTIONAL CAMPAIGN PLANNING**

BY MAJOR SETH LUCENTE AND COLONEL GREG WILSON

US President Barack Obama said, “Any attempt by the Syrian government to employ or strategically field biological or chemical weapons would cross a ‘red line’ that could lead the United States to change its posture in dealing with the Assad regime’s attempt to remain in power.” In order to achieve U.S. policy goals related to monitoring and/or securing Syria’s missile stockpiles, chemical weapons and clandestine nuclear activities, this report identifies four courses of action for consideration.

Introduction

The outbreak of rebellion and conflict against the regime of Syrian President Bashar Assad in March 2011 has raised questions in the United States and Europe about the security of Syria’s chemical weapons sites and potential use or transfer of such weapons.¹ In the aftermath of the 1967 Arab-Israeli War, Syria sought to acquire and maintain an arsenal of chemical, biological and nuclear weapons of mass destruction with the help of Russia, China, Iran and North Korea. U.S. policy toward Syria since the 1980s has ranged from confrontation, containment and cautious engagement dealing with its clandestine WMD activities.² On August 20, 2012, President Barack Obama cautioned Syria on the use of WMD saying, “Any attempt by the Syrian government to employ or strategically field biological or chemical weapons would cross a ‘red line’ that could lead the United States to change its posture in dealing with the Assad regime’s attempt to remain in power.”³ However, with the American public war-weary and U.S. resources stretched to the breaking point from more than 10 years of protracted conflict in Iraq and Afghanistan, a ground invasion is clearly an unattractive option.

Developing unconventional intervention strategies that achieve U.S. policy objectives and limit the expenditure of U.S. blood and treasure are increasingly in demand. Unconventional warfare or assisting an ongoing rebellion offers U.S. policy makers one such economy-of-force option to consider. However, UW requires in-depth knowledge of a country’s socio-cultural dynamics, social structure, resistance potential and how those willing to take up arms against their government might align with U.S. policy objectives. Developing the intelligence picture to provide this level of insight typically takes years to build and normally requires an extensive human intelligence network. Using the Syrian Rebellion as a case study, this essay examines the utility of leveraging open-source social media (YouTube, Twitter and Facebook) along with advanced analytical methodologies like social-network analysis to increase our understanding of both the political and armed opposition. Expanding our analytical tools for illuminating dark networks, such as resistance

forces operating in denied areas, is a critical requirement for SOF planners to develop a UW intervention strategy.⁴

Methodology

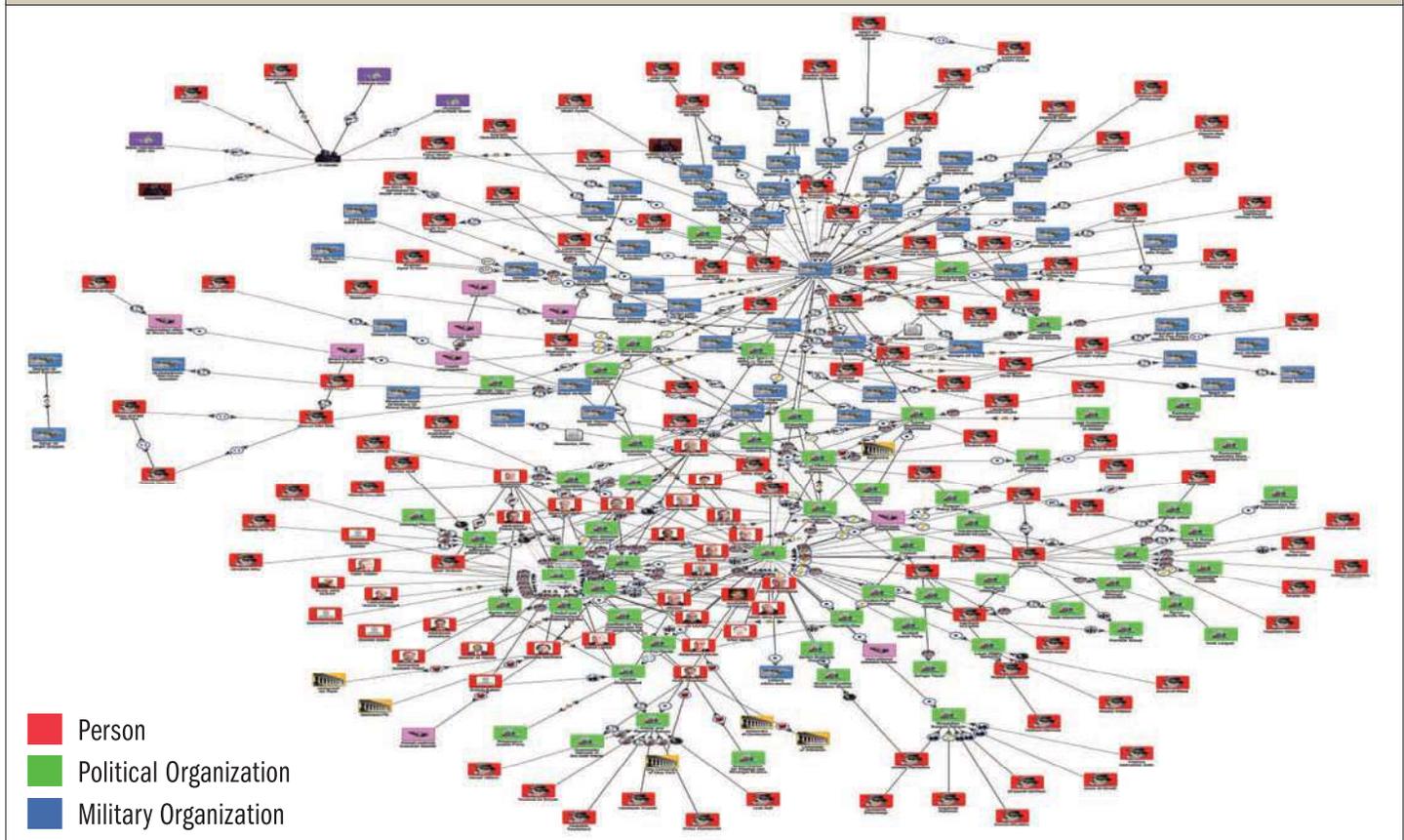
CORE Lab research associates at the Naval Postgraduate School in Monterey, Calif., conducted this study. The CORE Lab is an Office of the Secretary of Defense sponsored research activity that serves as the center of gravity for teaching and research on irregular warfare analytical methods. Three visual analytic methodologies are emphasized in our courses and research projects: geospatial, temporal and relational or social network analysis. The application of these methodologies, and the analytical software tools associated with them, enables operators to collect, manage and fuse data in order to create a more complete picture of the common operational environment.

This study fuses open source, social media, temporal records, geospatial data and relational analysis to create a common operational picture from which policymakers and SOF military commanders can make informed decisions.⁵ Geospatial data facilitated the visualization of both Syrian geography and the distribution of armed opposition forces and WMD sites located throughout the country. Social-network analysis examines relational data associated with more than 290 individual, political and military opposition entities identified through open-source research.⁶

The research team developed a detailed research plan that included the construction of ontologies and codebooks that standardize data collection and entry into analytical packages. Network visualizations were conducted using various analytical packages.⁷ Additionally, a network-visualization package developed in the CORE lab, called Dynamic Tweet Network Analysis (DTna), was used to scrape Twitter data and social-media content in select Syrian cities based on keyword search terms.⁸

Syrian opposition Network Anatomy

Identifying the key stakeholders entangled in the Syrian rebellion is job one for UW campaign planners and is no easy task. Social-network analysis has much to offer planners seeking to

FIGURE 1: “FEDERATION NETWORK” SYRIAN POLITICAL, MILITARY AND JIHADIST OPPOSITION

illuminate or map these dark networks. Social-network analysis guru Valdis Krebs defines SNA as “the mapping and measuring of relationships and flows between people, groups, organizations and other connected information/knowledge entities. The nodes in the network are the people and groups while the links show relationships or flows between the nodes.”⁹

Social-network analysis can provide key insights into the overall topography and structure of social networks. Utilizing SNA, we examined the political and armed opposition’s network topography and in particular looked at the network’s density and centralization. Network density gives planners a feel for how sparse or connected the network is, while centralization helps provide insights on whether the network is centralized around a few key actors. These measures confirmed our hypothesis that the opposition network is far from a formal, centralized hierarchy; in fact, it is an ad-hoc umbrella of interconnected, multi-relational, sub-organizations geographically dispersed throughout Syria that connect primarily through various social-media applications.

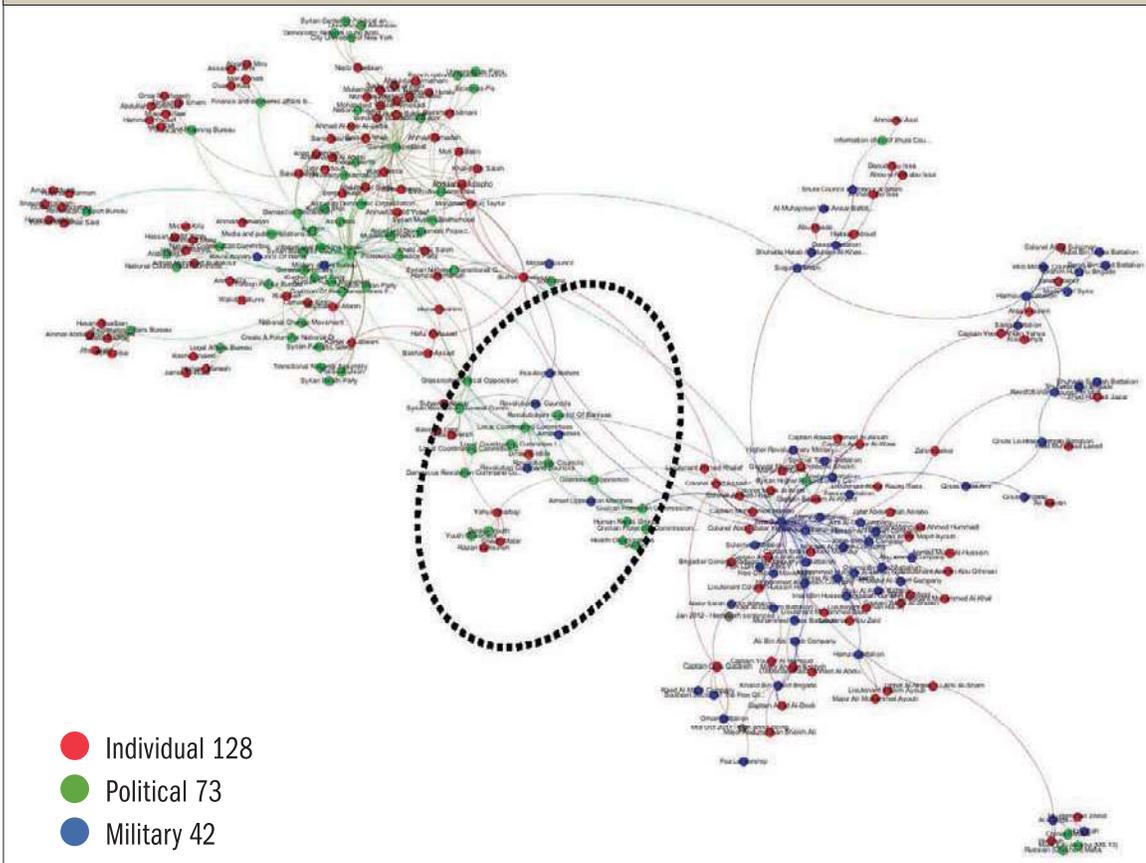
The most common network structure utilized by a revolutionary opposition force, whose units are spread geographically throughout the operational battlefield, is the federated model, which provides a good deal of autonomy to subordinate units. “In a federation, the core network serves as the hub of multiple, relatively autonomous hubs.”¹⁰ For example the American Revolutionary War was a federation of numerous state militias combined to

field the American Continental Army. Network centralization and variance are measures that capture the hierarchical dimension of network topography. They help researchers determine how hierarchical (or non-hierarchical) a network is. Centralization uses the variation in actor centrality within the network to measure the level of centralization. Figure 1 highlights the federated nature of the Syrian opposition network.¹¹

Social-network visualizations (sociograms), like the one in Figure 2, provide key insights into the network’s social structure. Planners can gain valuable insights by examining the structural position of key actors within the network. Here we can see that there is a group of actors (circled) who are in brokerage positions between the rebellion’s political and armed opposition. If it is in the U.S. interest to facilitate closer coordination between the political and armed opposition, then we would want to further examine these actors located in structurally advantageous positions. SNA was also used to identify central actors and cohesive subgroups within the network.

In fact, one such subgroup detected was a Syrian homegrown Salafi-jihadist group — Jabhat Nusra. This jihadist opposition sub-network is depicted in the lower right of Figure 1. A Syrian analyst argues “Jabhat Nusra is far more dangerous to the long-term stability of the Syrian state than foreign jihadist groups because it represents a metamorphosis of a Salafi-jihadist ideology into a domestic platform that is able to achieve popular resonance.”¹²

FIGURE 2: NETWORK VISUALIZATION OF SYRIAN POLITICA AND MILITARY OPPOSITION



Analysis of the FSA's authoritative (command and control) network combined with social-media information highlights the fact that only 27 of the 42 opposition units claiming to support FSA operations actual did so. The remaining 15 units are simply uncooperative rogue elements that undermine civil leaders and threaten any prospects for a viable post-Assad government. Further, research on the 27 FSA units using Facebook, Twitter and YouTube revealed that only four of the 27 units had demonstrated proficiency in offensive combat operations against Assad's regime force, were closely

FSA Communications Network (Social Media)

"We use Facebook to schedule the protests, Twitter to coordinate and YouTube to tell the world." - Anonymous Cairo activist.¹³

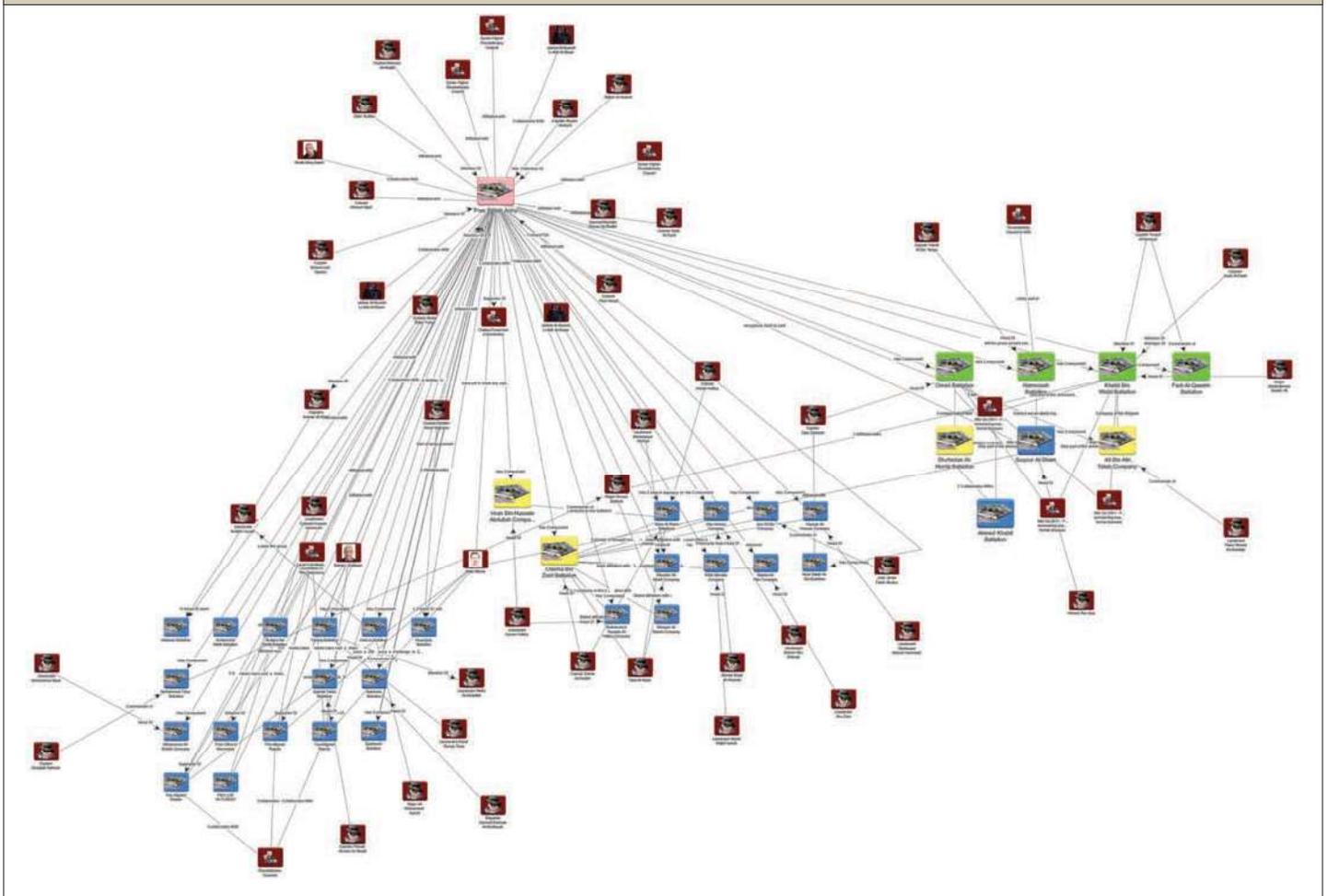
Social media has become a valuable political tool. "It is an unparalleled instrument for the purpose of mobilization, denouncing state violence and other human-rights abuses, as well as enabling democratization."¹⁴ Applications such as Facebook, Twitter and YouTube allow users to interact, participate or collaborate nearly real-time with one another. The proliferation of the smartphone and nearly universal accesses to wireless Internet technologies has enabled social-media users to rapidly mobilize social protests, document a humanitarian crisis as it unfolds and disseminate information globally simply by pushing "send" on their wireless device.¹⁵ The FSA's communication network is a unique "Web-based community" that expects to be notified via social media (Twitter, Facebook, YouTube). The FSA utilizes social media for disseminating information, monitoring current operations, logistics and consolidating battle damage assessments reports — all critical for follow-on missions. This investigation found that nearly 90 percent of the primary data sources originated from the three most widely and effectively used social-media sources — Facebook, Twitter and YouTube. These social-media sites provided a window into the armed opposition units and were leveraged to assess organizational structure, operational activities, unit strengths/weakness, combat effectiveness and to determine if unit leadership might align with U.S. policy objectives.

aligned with the FSA at the strategic, operational and tactical level and appeared to have the motivation and potential to align with U.S. policy objectives. Figure 3 provides a visualization of these selected opposition units and their support networks.

Geospatial Analysis: Risk Terrain Model

Arguably, the best way to assess risk and predict future areas of conflict is to use past behavior, either in terms of actual incidents or as a collection of incidents (i.e. hotspots) as indicators of future behavior.¹⁶ Hotspot mapping is the use of cartographic techniques to create and visualize cluster density or the intensity of events over a geographic area. As better data and more advanced mapping techniques become available, opportunities emerge to move beyond historically based hotspot and density mapping to a near real-time evidence-based, predictive risk-assessment strategy.¹⁷

Risk terrain modeling is an approach to spatial risk assessment that utilizes geographic information systems and remote sensing to visualize, measure and analyze geospatial data. RTM is a combination of separate map layers that once overlaid together highlight the presence, absence or intensity of numerous factors geospatially on a terrain map.¹⁸ A concise RTM is designed to be predictive and, as such, can illuminate which of Syria's WMD sites are at the greatest risk of compromise. This RTM examines (1) the disposition of the Syrian regime, FSA and Jihadist armed forces, (2) the locations that experienced the greatest level of conflict and (3) identifies Syria's

FIGURE 3: VISUALIZATION OF RECOMMENDED FSA UNITS AND SUPPORT NETWORKS

WMD sites. As expected, it found that most of the armed clashes have taken place inside villages and cities along the country's main north-south highway.

The strategic position of the City of Homs at the intersection of Syria's main east-west and primary north-south highways has exposed it to the greatest level of conflict in Syria. The RTM highlighted Homs as the greatest concern based on its strategic location and high frequency of combat operations, as well as other at-risk WMD locations. We then overlaid the identified opposition units who were in close proximity and determined to have the highest potential of supporting U.S. policy objectives.

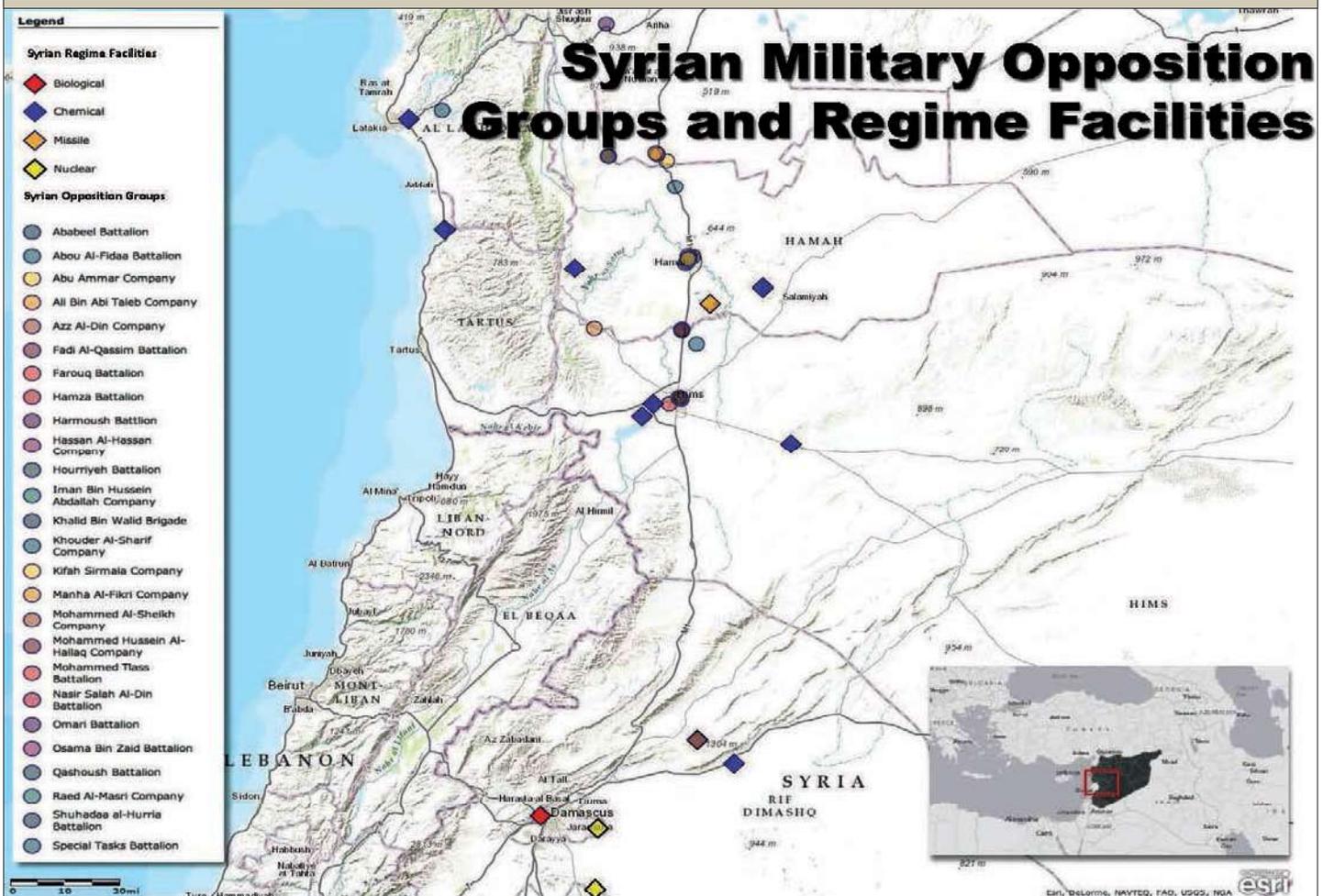
Opportunities and Challenges

This research project clearly demonstrates the usefulness of leveraging open-source social-media information (YouTube, Twitter, Facebook) and advanced analytical methodologies like social network analysis to increase our understanding of dark networks like the Syrian opposition. The insights provided by social-media exploitation, social-network analysis and the geospatial risk-terrain model received high marks from both military planners and leaders exposed to the project. Intelligence professionals marveled at how quickly three researchers could illuminate and map elements of the

Syrian political and armed opposition with open source information. One officer familiar with the project said "This would have taken an entire intelligence section numerous months to develop the analytical products and potentially years for the intelligence community to develop the sources and contacts with access to this type of information".¹⁹

Of course open-source social media information and advanced analytical methodologies are not a panacea. Some wonder if we can really trust or verify the veracity of information posted using social-media sources. Researchers involved in this study shared this same skepticism but were surprised at the overall accuracy of posted information. Much of the information, such as pictures, videos and Tweets, were geo-tagged and could be quickly verified geospatially. Researchers found one website that was crowd-sourcing pictures of Syrian military installations and uploading the information into a visual map display. Leveraging this type of geo-tagged information can greatly expand our knowledge into denied areas where human intelligence sources are lacking. Additionally, some information can actually be self-correcting, in that the wisdom of the crowd can squash false statements.²⁰ That being said, information gleaned from open-sources should still be verified and cross-checked with other information sources.

FIGURE 4: RISK TERRAIN MODEL THAT MAPS FSA UNITS AND WMD SITES



Additionally, leveraging advanced analytical methodologies like social-network analysis will require the development of highly skilled analysts with the proper education and training. Defining network boundaries and capturing complete relational data on networks is difficult work. Analysts must be capable of developing detailed ontologies and codebooks that standardize data collection and entry into analytical packages. Keeping social-network analysis information current is also a challenge as resistance networks are constantly in flux as they recruit new members and suffer losses. However, in doing so analysts have the opportunity to glean insights on how the network is changing over time. Additional challenges include access to open-source information as many military networks restrict access to social-media sites and most of the analytical software packages used in this study are currently not approved to be loaded on military networks.

Conclusion

Maj. Gen. Michael T. Flynn recently noted that after 10 years of continuous U.S. combat operations America’s “intelligence apparatus still finds itself unable to answer fundamental questions about the environment in which we [DoD] operate and the people we are trying to protect and persuade.”²¹ Both Maj. Gen. Flynn and Gen.

Stanley McChrystal emphasized the need for U.S. intelligence collection efforts to continuously evolve as the asymmetrical conflicts in the future “will be won by persuading the population, not by destroying the enemy.”²²

This is particularly true for developing UW-intervention strategies that rely on deep socio-cultural understanding and seek to illuminate resistance elements that are often operating in denied areas. This essay demonstrates that by combining open-source social media information and advanced analytical methodologies such as social-network analysis and geospatial risk-terrain modeling, researchers can provide insights and analytical products that can inform the crafting of UW intervention strategies. As we saw in this paper, researchers were able to leverage social-media exploitation of open-source content (YouTube, Facebook, Twitter) and SNA to first examine the Syrian political and armed opposition network’s topography which included the identification of central actors and actors with brokerage potential based on their structural position within the social network as well as cohesive subgroups within the network. These techniques enhance our understanding of complex networks and move well beyond traditional link analysis. Next, through social-media exploitation they identify key FSA entities/ individuals who appear “cooperative” and potentially could be

leveraged in support U.S. policy objectives. Finally, through risk-terrain modeling they mapped Syrian WMD sites and determined which sites were at greatest risk of compromise and which opposition units were in proximity to potentially assist given a change in the U.S. posture towards the Assad regime. It is this type analysis that informs the development of UW-intervention strategies designed to provide U.S. policy makers options to leverage indigenous resistance potential when appropriate.

In closing, given the unprecedented amounts of raw information today's analyst must ingest, Maj. Gen. Flynn highlighted four critical elements: "analysts must absorb information with the thoroughness of historians, organize it with the skill of librarians and disseminate it with the zeal of a journalist ... [an analyst] must embrace open-source, population-centric information [social

media] as the lifeblood of their analytical work."²³ While each conflict is unique, one thing is clear, social media will continue to be leveraged to effect political change. With this in mind, future UW campaign planners will need to embrace open source social-media information and the advanced analytical methodologies required to better understand the complex operational environment. **SW**

Major Seth Lucente is a Naval Postgraduate School student and CORE Lab SOF Intelligence Research Analyst Intern (stlucent@nps.edu. 831-656-3519). Active Army Military Intelligence (35C/D/G) Officer seth.lucente@us.army.mil. COL Wilson, Army Special Forces, the SOCOM Chair and Co-director of the CORE Lab at the Naval Postgraduate School. The research associates who worked tirelessly on this study are Mr. Rob Schroeder and Mr. Gregory Freeman.

Notes

1. I would like to thank CORE Lab Research Assistants Greg Freeman, Rob Schroeder, Seth Gray, Alexander Creasey, Daniel LeRoy, Daniel Cunningham, Professor Sean Everton and Patrick Dudas for their insight.

2. Note. While the exact location of serious chemical weapons storage and production sites remain unknown, the August 2012 Center for Nonproliferation Studies at the Monterey Institute of International Studies (MIIS) report provides a great start point. The www.nti.org Syrian country-profile identifies many of the biological, chemical, production, storage and nuclear material sites.

3. "Elite Western Forces are Poised to Move on Syria's Chemical Arms," Global Security Newswire, National Journal, August 24, 2012. www.NTI.org Accessed January 02, 2013.

4. A dark network is typically defined as a covert and illegal network, essentially "any group that seeks to conceal itself and its activities from authorities" Sean F. Everton *Disrupting Dark Networks* (Cambridge and New York: Cambridge University Press), p. xxv. The term was initially coined by Jörg Raab and Brint Milward, "Dark Networks as Problems," *Journal of Public Administration Research and Theory* 13(4):413-39.

5. Relational social media sources were harvested from Facebook, Twitter, and YouTube websites utilized by Syrian civil-military opposition elements. Temporal social media data sources included the Institute Study for War (ISW), Syrian Conflict, Middle East Security Reports 2-6 and Syria: Unrest and US Policy, Congressional Service Report (CRS), May 24, 2012. Geospatial mapping included fusion social media crowdsourcing data aggregators: Syria tracker, Syria Uprising 2011, and Ushahida. Unclassified National Geospatial Agency (NGA) products based on social media provided an approximate (+/- 10KM) operational disposition of Syrian opposition forces. Finally the Strategic Research and Communication Center, Nuclear Threat Initiative (NTI), provided the general location and description of Syria's WMD sites.

6. The creation of comprehensive research ontology prior to coding and tagging related documents, videos, and audio maintained the integrity, quality, and consistency of the data used in this analysis. Ontology defines a common vocabulary for researchers who need to share definitions of basic concepts and relational data. The research data identified 290 entities, 128 persons, 71 political organizations, and 42 military organizations using Palantir. Palantir is a suite of software applications for integrating, visualizing and analyzing relational, temporal and geospatial information from both structured and unstructured data. Palantir Technologies Website. www.palantir.com/about. Palantir products are built for real analysis with a focus on security, scalability, ease of use and collaboration. They are broadly deployed in the intelligence, defense, law enforcement and financial communities. Accessed December 28, 2012.

7. Analytical software packages include Palantir, ORA, and Gephi.

8. Dynamic Tweet Network Analysis was developed by Patrick Dudas and Russell Shepard.

9. Valdis Krebs is the Founder, and Chief Scientist, at Orgnet, LLC. Valdis is a man-

agement consultant, researcher, trainer, author, and the developer of InFlow software for social and organizational network analysis [SNA/ONA]. <http://www.orgnet.com/sna.html>. Accessed August 18, 2012.

10. Patti Anklam, "Net Work: A Practical Guide to Creating and Sustaining Networks at Work and in the World," (Butterworth-Heinemann, Oxford, UK), 2007, 67.

11. Anklam, *Net Work*, 58.

12. Elizabeth O' Bagy, "Jihad in Syria," *Middle East Security Report* #6, 2012. Washington, DC Institute for the Study of War (ISW), 2012, 6.

13. Anonymous Cairo activist, quoted in Nadine Kassem Chebib & Rabia Minatullah Sohail, "The Reasons Social Media Contributed to the 2011 Egyptian Revolution," *International Journal of Business Research and Management* 3 (2011): 139.

14. Sara M. Smyth, "The New Social Media Paradox: A symbol of Self-Determination or a Boon for Big Brother?" *International Journal of Cyber Criminology*. January-June 2012, Vol 6 (1): 924-950

15. Sara M. Smyth, "The New Social Media Paradox: A symbol of Self-Determination or a Boon for Big Brother?" *International Journal of Cyber Criminology*. January-June 2012, Vol 6 (1): 924-950.

16. Crowdsourcing Mapping. Geospatial work on military conflict hotspots has generated a great deal of interest in the application of spatial analysis to an unconventional warfare environment in which Special Operations Forces (SOF) operate. Specifically, it is applied in ways scholars and practitioners consider the origin and dispersion of armed conflict.

17. Joel M. Caplan. and Leslie W. Kennedy, *Risk Terrain Modeling Compendium: For Crime Analysis*. Newark, NJ: Rutgers Center on Public Security 2011, 85. www.rutgerscps.org.

18. Caplan and Kennedy, *Risk Terrain Modeling Compendium*, 11.

19. COL Michelle Schmidt, NPS Senior Service College Fellow, and Senior Intelligence Advisor to the CORE Lab

20. Goolsby, Rebecca, and Carley, Kathleen, "Twitter in Troubled Times: Understanding Social Media from a Social Science Theoretical Base." SMA Speaker Teleconference, Pentagon, January 15, 2013. The wisdom of the crowd often prevails on the web meaning that there are enough ethical social media users to squash false rumors.

21. Michael T. Flynn, Major General US Army, "Fixing Intel: A Blueprint for Making Intelligence Relevant in Afghanistan" (*Center for a New American Security-Voices From the Field*), 2010, 4.

22. Stanley McChrystal, General US Army, "International Security Assistance Force (ISAF)," *Commander's Counterinsurgency Guidance*, 2. Cited in Flynn's CNAS, *Fixing Intel*, 2010, 24.

23. Flynn, *Fixing Intel*, 24.