Preparing for the future….
Never forgetting the past!

Office of Naval Research Code 30
Thrust Area Willful Intents
FY12 - FY13

Understand TIA – Willful Intent

Current Capability:
- CVE: Disparate definition set across science disciplines on factors of VE; no definitive "factors" of violent extremist(s) formation, organization, and behaviors; no definitive or set of theories/factors on radicalization process
- IRS: Only State level indicators suggesting instability
- IRS: Social science domains have developed independent (single discipline) theories with different assumptions and at different levels of analysis (state, region)
- IRS: Descriptive subject matter expertise driven qualitative work; Historical case studies and/or near real time lessons learned

FY	Desired Capability	S&T Challenge	S&T Solution
Near Term FY12-FY14	• CVE: Characterize factors (multidiscipline parameters, behavior patterns) that will define an individual or group as extreme and violently extreme. • CVE: Develop the ability to understand (or probabilistically predict) differences and tipping characteristics from extremist groups to violent extremist groups. • CVE: Determine profile of individual/group susceptibility to influence, including risk factors for radicalization. • IRS: Defined fundamental multi-disciplinary characteristics that describe stability and instability and at different levels (region, state, province)	• CVE: The availability of data and data granularity (to get from state, to province, to group, to individual), find common definitions. • CVE: To define multi-disciplinary techniques to observe/study real world VE groups • IRS: Availability of appropriate data, standardized definitions	• CVE: Case studies to determine first cut at characteristics definition of VE (individual and group). • CVE: Multi-disciplinary literature work and field work to determine techniques that work, are reproducible, and scalable to collect/observe/define factors of extremist and violent extremist individuals/groups • IRS: Research existing/emerging Stability Risk Assessment methods to characterize stability, instability and risk indicators to move from stability to instability • IRS: Empirical evidence (or anecdotal) supporting methodologies. • IRS: Study historical case studies to develop regional/provincial variables and data sets that can address instability
Mid Term FY14-FY17	• CVE: Definition of the factors (including goals / objectives / behaviors) that distinguish VEOs from other organizations; Definition of which factors can/should be used to measure VEOs • CVE: Empirically proven process(es) by which an individual becomes extremist, and capable of violence. • CVE: Collection processes for VE factors (literature, field, emerging technologies) applicable to varying operational scenarios (full access, denied/limited access, conflict) • IRS: Defined factors that show how one nation's instability effects stability in a region or neighboring states • IRS: Rapid collection and analysis of relevant social media supporting defined instability factors/characteristics. Including the use of mobile devices and crowd sourcing as input mechanisms and data sources	• CVE: Collection/development of data and experiments on VEO networks and organizations that are largely covert; Identify appropriate control groups matched on key factors • CVE: Data availability – granularity and longitudinal • CVE: Applicability of social media data in defining factors, proving recruiting processes. • IRS: Data – granularity and longitudinally • IRS: Complexity of actors, environment, and events within and between neighboring states • IRS: Complexity/Size of collection, storage, and analysis of social media	• CVE: Build on near term findings to better define the key factors that need to be studied to understand violent individuals and organizations. • CVE: Apply developing models and theories in network analysis techniques to understand formation of networks of violent organizations • CVE: Develop empirically proven methods/models for using social media data • IRS: Apply multidisciplinary modeling approaches (e.g., sociology, economics, political science, mathematics, anthropology, etc.) to study complexity of area (province, state, region) movement between stability and instability • IRS: Develop and validate new means to collect and analyze social media data

Understand TIA – Willful Intent Continued

FY	Desired Capability	S&T Challenge	S&T Solution
Far Term **FY17-FY21**	• CVE: Model how VEOs form (identify conditions for formation), maintain themselves, expand/contract, and dissolve • CVE: Characterize the strategies and tactics of VEOs, including media used for communication, recruitment, and tactical actions • CVE: Rapidly identify key VEO individuals and groups and the effects of their influence • IRS: Understand factors leading to stability state change, identify tipping points • IRS: Rapidly determine opinion and sentiment (to include social media)	• CVE: Data gathering and observational capabilities • CVE: Theory (ies) models to explain VEO lifecycle • CVE: Generalizability of theory/models for understanding CVE: strategy/tactics/influence of VEOs • IRS: Which theories, models, methods to apply to which conditions • IRS: Data collecting and observational capabilities • IRS: Rapid collection and analysis to determine sentiment	• CVE: Build on mid-term modeling effort to expand models to full lifecycle of VEOs. • CVE: Empirically test generalizability of models/theories for understanding strategy/tactics/influence of VEOs • CVE: Novel methods for observing data necessary for modeling and empirical tests. • IRS: Empirically tested models, methods in context • IRS: Observational and data collection research for near real time analysis • IRS: Novel methods/models for understanding tipping points

Endstate:

• CVE: Have knowledge and methods to identify individuals and organizations categorized as "violent extremists", characterize the threats and risks associated with these groups and organizations, understand the influence of these groups.

• IRS: Identify the key characteristics, indicators that define stability, instability, and indicators that point to change between stability and instability at the region, state, and province levels

Detect TIA – Willful Intent

Current Capability:
- CVE: SME driven analysis of data to discover sociocultural signatures; Data collection inconsistent and generally SME driven (which data to collect to drive analysis); Stovepipe theoretical models used in analysis
- IRS: Reactive vice proactive – discovery often only after public announcement. Distinguish and location through best SME effort.

FY	Desired Capability	S&T Challenge	S&T Solution
Near Term **FY12-FY14**	• CVE: Capability to discover, distinguish, locate VEOs footprint using empirically proven electronic, rhetorical, social and traditional media, financial, etc. • CVE: Identify "best" sources of information for detecting VEO's: traditional media, social media, sensor data, intel sources, open source • IRS: Indicators and warnings indicative of instability at the regional, state and provincial levels	• CVE: Study VEOs given they are covert. Identification of control groups • CVE: Applicable multi-discipline theories necessary to discover, distinguish, locate VEOs • IRS: Examining indicators of instability as an integrated approach vice as independent indicators (social unrest, economic change). • IRS: Developing large multidiscipline case studies • IRS: Use of newer technologies (social media) as indicators of stability/stability change	• CVE: Develop and test observational and interview methods to characterize the footprint of groups • CVE: Conduct controlled studies that compare VEO's and non-Violent EO's • CVE: Build on "Understand" models to add sociocultural factors and multi-disciplinary theories to be able to discover, distinguish, and locate VEOs • IRS: Research multi-methodological and multi-discipline approaches to identify indicators and warnings. • IRS: Study new data sources that allow indicator and warnings at a more local/provincial level
Mid Term **FY14-FY17**	• CVE: Capability to identify behavior factors that are conducive to the emergence of VEOs • IRS: Capability to identify 3 months to 1 year in advance indicators and warnings of changing stability • IRS: Identify which indicators under which sociocultural conditions and at what level (region, state, province) promote a likely change in stability.	• CVE: Theories and models of VEO sociocultural behaviors and factors are limited and not (generally) empirically tested • IRS: Full understanding of indicators and warnings geographical level relationships	• CVE: Build on near-term models and use case studies to models and study VEO sociocultural behaviors • IRS: Temporal models empirically (historical cases) tested that can detect change • IRS: Models that can identify at different levels the conditions of a possible change in stability
Far Term **FY17-FY21**	• CVE: Distinguish and geo-locate VEOs and associated networks • IRS: Identify tipping points of instability	• CVE: Methods and models of sufficient breadth of theory and depth of data to distinguish and locate VEOs • IRS: Full understanding of which indicators/warnings and under what conditions do they form tipping points	• CVE: Use network science approaches to find sociocultural signatures to distinguish VEOs • CVE: Build on near-term/mid-term models to add to discovery with distinguish and locate methods/theories/factors • IRS: Apply complexity theory to investigate the existence of tipping points from historical case studies.

Endstate:
- CVE: Capability to discover, distinguish, and locate VEOs in an automated fashion using a range of data sources
- IRS: Capability to detect indicators and warnings of instability in an automated fashion using a range of data sources.

Forecast TIA – Willful Intent

Current Capability:
- CVE: SME's opinion on the analysis of patterns of behavior of VEOs and their future actions
- IRS: ICEWS system for PACOM uses "relatively structured" news media to forecast instability by country in PACOM AOR – system being transition to STRATCOM for strategic level analysis.

FY	Desired Capability	S&T Challenge	S&T Solution
Near Term **FY12-FY14**	• CVE: Determine factors and social science disciplines necessary to forecast behaviors of individual and organization violent extremists • IRS: Precise models of instability and indicators • IRS: Information sources (beyond formal media) that can provide leading indicators of stability change	• CVE: VEO Theories/models applicable to non-western cultures • CVE: Empirically test decision frameworks in appropriate cultures • CVE: Few studies on the impact and veracity of different data sources (social media, survey, literature, etc) • IRS: Temporal relationship between sociocultural indicators of stability and change in stability • IRS: Lack of research on the impact of social media and other emerging data sources and their veracity	• CVE: Case studies/experiments on applying existing VEO theories to non-western cultures • CVE: Build on "understand" factor development to develop those factors and disciplines (theories) needed to forecast plausible futures of VEOs • IRS: Integrate non-formal media sources of data into ICEWS
Mid Term **FY14-FY17**	• CVE: Track expansion/contraction of VEO along various dimensions (time, space, violence, violent rhetoric, network size, etc.) • CVE: Utilize social media content (twitter, blogs, etc) and determine which dimensions it can be used as a non-invasive means of data collection for tracking VEO changes • IRS: Temporal correlation of social media content to future events	• CVE: Uncertain and missing data impairs ability to examine networks, understand intent • CVE: Data availability on covert VEOs • CVE: Methods for ingest and analysis of large data sets (social media, blogs, unstructured text/video) • IRS: Veracity of social media data to ground truth beliefs and behaviors	• CVE: Use multi-method approaches to understand the data patterns of social engagement in VEOs • CVE: Develop models that utilize observable data to build sociocultural networks • CVE: Leverage DARPA research and mathematical techniques to handle large data sets • IRS: Conduct comparative studies of social media and traditional media and information sources to determine veracity of social media data • IRS: Model and validate forecast capability of social media data in historical cases
Far Term **FY17-FY21**	• CVE: Track and forecast the sociocultural behavior of VEO in near, mid, and long-term • IRS: Social media predictive models added to ICEWS capability showing improvement in forecast capability and predictions at finer level of detail (province level)	• CVE: Data necessary to produce sufficient patterns of VEOs; not enough data to identify generalizable long term trends • CVE: Validation methods to produce confidence in forecasting models • IRS: Data availability, capability to process large amounts of social media data.	• CVE: Use historical cases to analyze and develop forecasting models of VEO lifecycle and behaviors • CVE: Use historical cases and emerging validation methodologies to validate VEO forecasting models • IRS: Research and validate social media forecast models capable of looking at stability at region, state, province levels • IRS: Integrated forecast social media models into ICEWS

Endstate:
- CVE: Capability to forecast behavior of VEOs geospatially and temporally
- IRS: Improved ICEWS (or ICEWS like) forecast capability with finer grain detail in both temporal and geographic trajectories

Mitigate TIA – Willful Intent

Current Capability:
- CVE: Development and measurement of CVE executed using MISO capabilities (largely SME driven, disparate databases) and increasingly with Strategic Communications.
- IRS: Mitigation of regional stability COAs dictated by SME experience – generally not interagency
- IRS: Measurement of effects of stability actions limited including MISO/Strategic communications

FY	Desired Capability	S&T Challenge	S&T Solution
Near Term **FY12-FY14**	• CVE: Measure the incidence and spread of VEO along various dimensions, and relate in time/space to US strategic, operational, and tactical actions. • IRS: Course of action options across the DIME spectrum; forecast and measurement of impact of each option	• CVE: Identifying the appropriate dimensions and time courses • IRS: Identifying the appropriate dimensions and time courses • IRS: Complexity of regional, state and sub-state stability and forecast and importance of 2nd and 3rd order effects	• CVE: Create theory driven, empirically tested methods for measuring the spread of organizations through their rhetoric and electronic footprint • IRS: Develop mitigation COA models that capture complexity of stability environments.
Mid Term **FY14-FY17**	• CVE: Capability to develop and measure COAs of US and other partners (including strategic communications) to mitigate a VEO messages and influence • CVE: Non-kinetic mitigation methodologies that deter VEOs and measure effectiveness • IRS: Capability to assess COA's that impact stability and security at the region and state level • IRS: Effective (measurable) Information Operations COAs	• CVE: Applying COAs to be effective requires means of measurement • CVE: Characterizing the impact of a mitigation methodology in a complex environment • IRS: Data requirements to isolating the impact of multiple COA's and influence factors at the region or state level • IRS: "Measuring" the impact a message has in a complex environment is not clean.	• CVE: Theory based, empirically tested models that can "what if" mitigation strategies and show means (that can be observed in real world) to measure effectiveness • IRS: Use historical data to test COA models and their effectiveness that deconstruct environmental complexities. • IRS: Identify proxy indicators, counter message trends, etc. that indicate a change in behavior due to shaping messages.
Far Term **FY17-FY21**	• CVE: Ability to "what if" mitigation strategies and distinguish effects on micro and macro target audiences (general population, local population, VEO) • IRS: Capability to assess COA's that impact stability and security at the province level	• CVE: Availability of data and empirically tested theories at this level of granularity • IRS: Modeling the complexity of understanding the impact of COA's across DIME spectrum	• CVE: Theory based, empirically tested capability to assess multiple methodologies for separating population and adversarial groups in message space. • IRS: Research measuring the impact of specific courses of action and integrate them into multidimensional (DIME) COAs

Endstate:
- CVE: Capability for structuring a MISO/Strategic Communications plan and measure its effectiveness.
- IRS: Capability to provide course of action options for influencing regional stability and security through all levels of national and international power.