



"EXCELLENCE IN EXPEDITIONARY INTELLIGENCE"

Marine Corps Intelligence Activity Joint Operational Environment

Tom McKenna
Amphibious Warfare Analyst
Phone: (703)432-8533
Cell: (757)846-4935
Email: tmckenna@mcia.osis.gov
SIPR: gumckta@mcia.usmc.smil.mil
JWICS: gumckta@mcia.ic.gov
Stoneghost: gumckta@mcia.us qlat

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Global Trends

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- **Globalization**
 - Integrated economies
 - Local conflicts carry international implications
- **Demographic Shifts**
 - Aging of developed world; “youth bulge” in underdeveloped world
- **Urbanization**
 - Population growth in cities and littorals
- **Technological Diffusion**
 - US loses technological dominance
- **Resource Competition**
 - Access becomes critical
 - Resource-driven conflict
- **Climate Change**
 - Potential for natural disasters in poorest areas of the world
- **Emerging/Re-Emerging Powers**
 - Russia, China, Brazil, and India
- **Emerging Diseases/Pandemics**

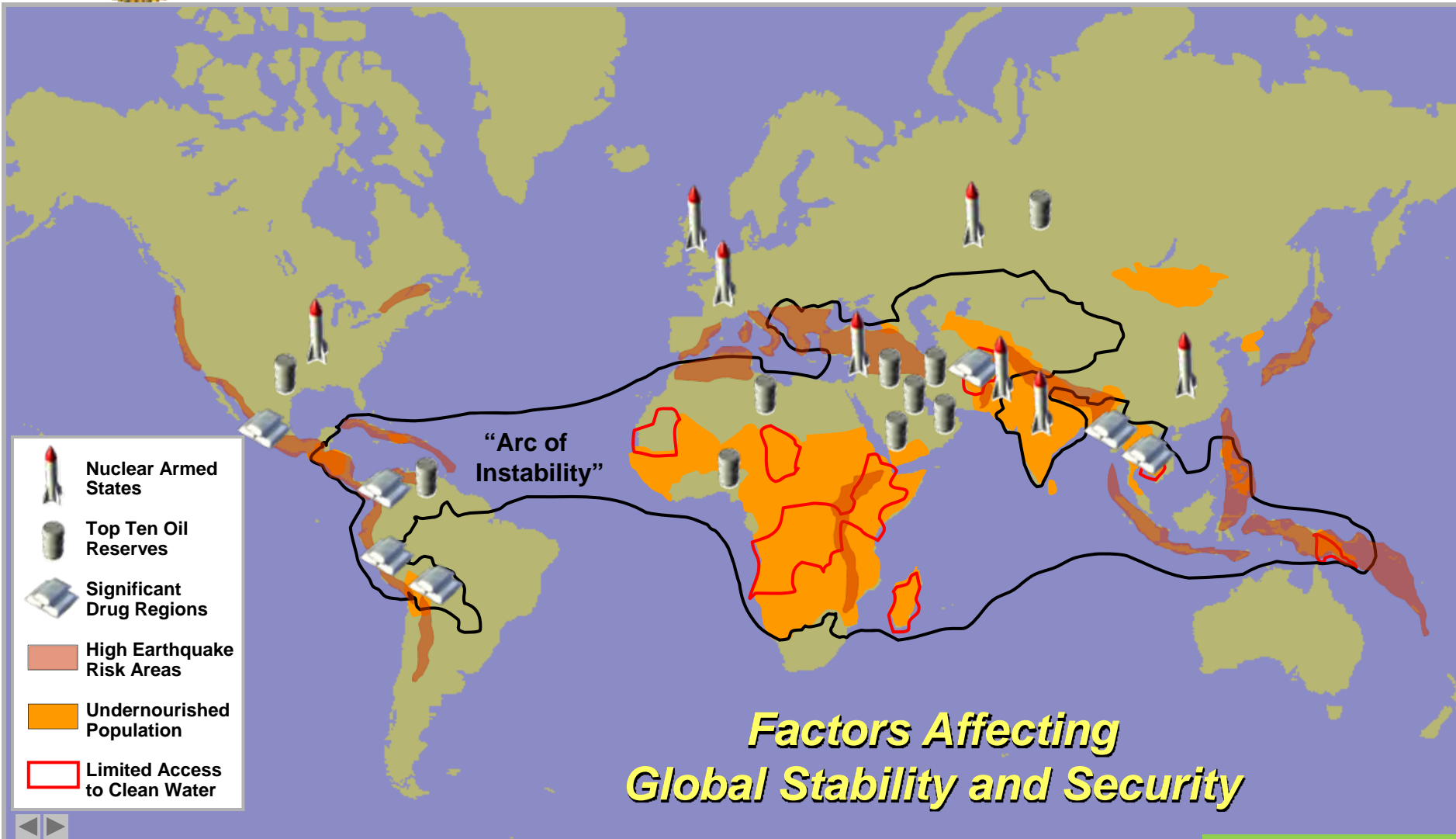


The ability to react effectively to unforeseen, unconventional, and unpredictable events will be critical.



Arc of Instability

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Conflict Trends

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- Blurring of conventional war, irregular war, and criminal activity
- Ethnic/Cultural/Tribal Conflict
- Resource Wars
- WMD/E Proliferation
- Longer Wars
- Terrorist acts declining; lethality increasing
- Controlling the "narrative" is becoming increasingly important
- War in ungoverned, or poorly governed, areas



Complex threats require flexible response options; no "one-size-fits-all" approach ; Constant consideration of 2nd and 3rd order effects



21st Century Warfare

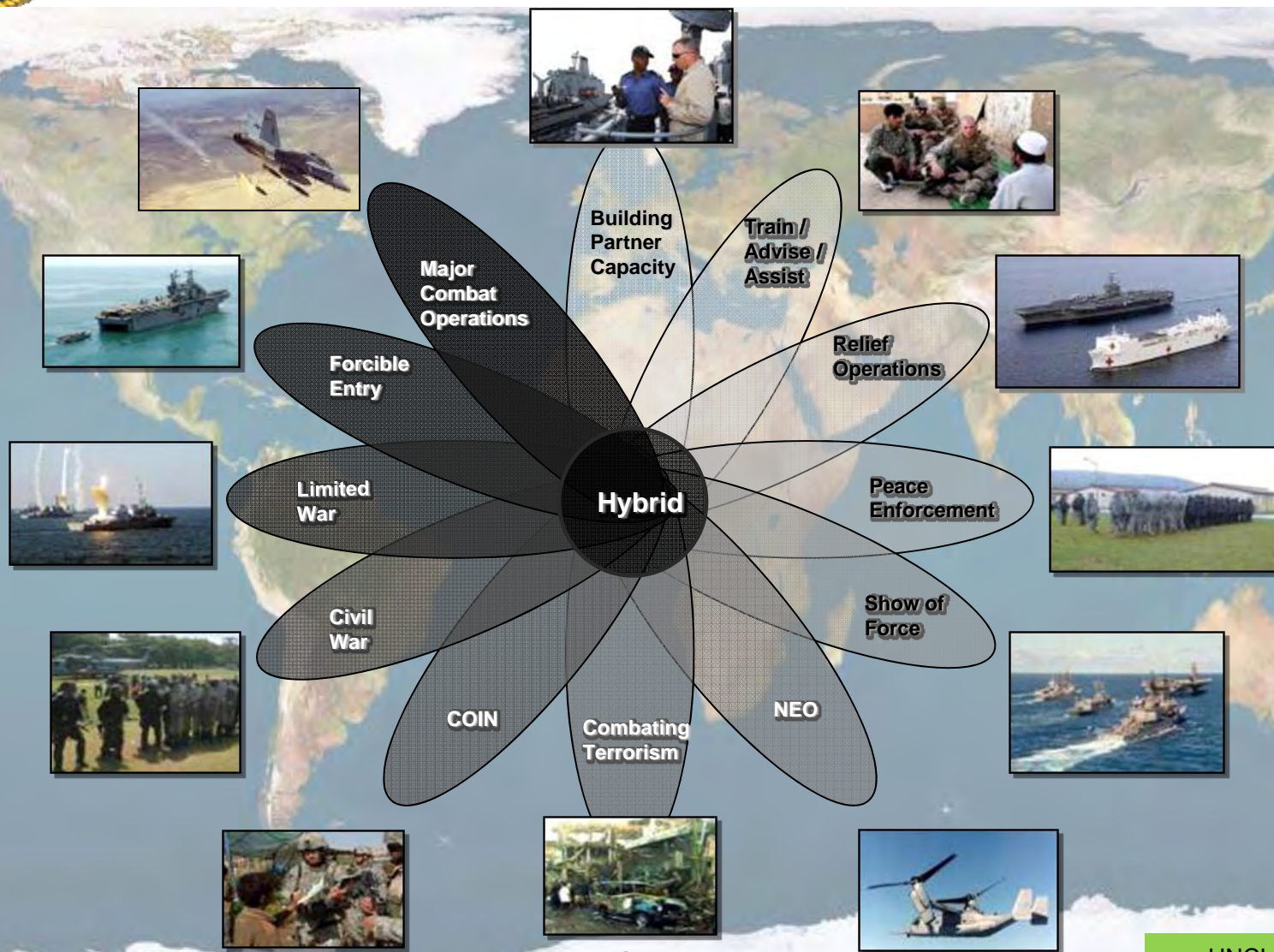
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- 21st Century Warfare will be defined by the balanced application of kinetic and non-kinetic means across the range of military operations to achieve strategic, operational, and tactical objectives
 - Civilian and Military Strategists must address use of military capabilities to produce *effects* outside of traditional conflict phase
 - Greater *access* and *leverage* may be achieved by capabilities which can generate non-kinetic effects in pre-conflict, transition to conflict, and reconstitution phases
 - Technology and Policy Threats must be viewed from every angle



Hybrid Wars require "Smart Power" (hard power + soft power)

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Hybrid Challenges

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- Opponents will present **all** forms of warfare and tactics, possibly simultaneously
 - Could include Criminal Activity
 - Increasingly difficult to characterize states as essentially traditional forces, or non-state actors as inherently irregular forces.
 - Modality versus structure: Should our definition focus on the adversary’s modes of fighting or his structure (combinations of states, nonstate actors, foreign fighters)?
 - Simultaneity: Does the force have to simultaneously employ four different modes of conflict or demonstrate the capacity to employ all four during a campaign?
 - Fusion: Does the force have to fuse different forces, regular and irregular, into the theater or must it mix different modes of conflict? How much coordination qualifies and at what level of war?
 - Multimodality: Does an actor have to mix all four modes, or are three out of four sufficient to make it hybrid?
 - Criminality: Is criminality a deliberate mode of conflict, or simply a source of income or support for gangs and the Taliban?

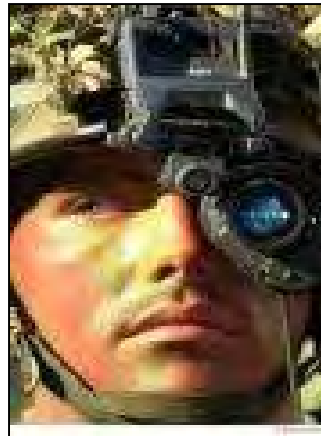
The boundaries between “regular” and “irregular” warfare are blurring. **Even non-state groups are increasingly gaining access to the kinds of weapons that were once the exclusive preserve of states.** And even states will increasingly turn to unconventional strategies to blunt the impact of American power.



Weapons and Tech Trends

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- IED's continue to evolve
- Increased proliferation and advancements in fusing/lethality mines
- Increased lethality of anti-armor technologies
- Increased optic capabilities
- Increased numbers of countries capable of producing effective small arms/ammunitions
- Increasingly sophisticated AD capabilities
- Increased interest in WMD (CBRNE)
- Increased interest in CoS technologies

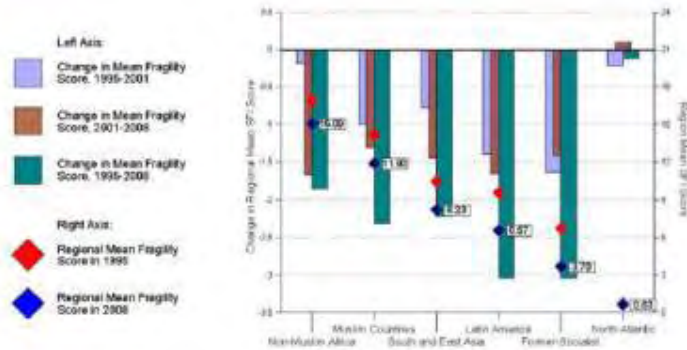


Enemies focused on eroding US advantage in terms of C4ISR, precision targeting, mobility, and firepower

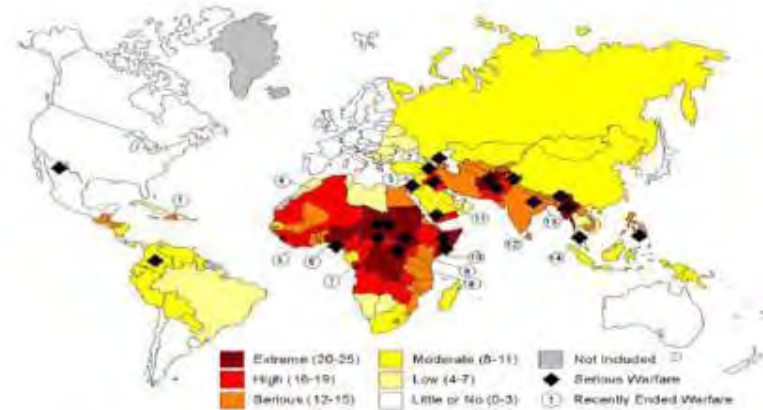


At-risk states & arms purchases

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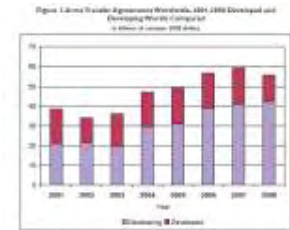


Regional state fragility declines (1995-2008)



Persistent global conflict (2009)

“Developing nations continue to be the primary focus of foreign arms sales activity by weapons suppliers. During the years 2001-2008, the value of arms transfer agreements with developing nations comprised 64.8% of all such agreements worldwide. More recently, arms transfer agreements with developing nations constituted 69.2% of all such agreements globally from 2005-2008, and 76.4% of these agreements in 2008.”



The **most at-risk nations** continue to make **proportionally large purchases** of foreign arms.



Asymmetric threats: PGM

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Hizbollah & Palestinian mortar and rocket threats to Israel

Munition technology can provide area fire weapons a precision targeting capability

Precision guided add-on systems available on international market:

- SPACIDO artillery course correction device (France)
- BONUS guided artillery munition (Sweden, France)

Available add-on precision targeting applications can **change area fire weapons to precision guided weapons** and could radically increase the targeting capability of asymmetric and non-state actors.



Bottom Line

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- PGMs are a growing threat
- PGMs account for a small percentage of overall ammunition stock pile < 3%
- Precision Guided Munitions can increase the probability of hit (Ph) and probability of kill (Pk)
- Technical capability does not equal military capacity
 - Possession of a PGM does not guarantee first round kill
 - Command and Control
 - Training
 - Accurate Targeting
 - Susceptible to countermeasures
- Technology advances will decrease cost and increase proliferation but the issue is targeting.
- Variety of countermeasures which can be employed with existing technologies



Current Systems

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- Laser homing
 - China GP-1 (155), GP2 (105), GP4 (120)
 - Russian Krasnopol & variants on 105mm and larger artillery systems
 - Costing data vary \$35 – 75K per round + LTD
 - Iran, China, Pakistan, and others
 - Observer must illuminate the target minimum 3-5 seconds
 - Synchronization of information between the battery position and the forward observer is critical to the efficient operation of the Krasnopol (Source: Janes)
- GPS with Inertial navigation
 - Rockets/Missiles WS-3
 - Accuracy requires an observer or known location
- Brilliant munitions
 - Hybrid features such as satellite navigation or INS along with seeker head
 - Multiple sensors and false target rejection capabilities

PGMs have limitations that can be countered (PRC)



PRC SCUD Decoy



PRC AAA Site Camouflage

- PGMs “easily influenced” by camouflage and concealment
- Decoys made it “very hard” to hit real targets
- Clouds, battlefield smoke, sand storms together with camouflage & concealment “effectively reduce the hit rate”
- GPS Jammers

PRC
Bodyguard
Smoke
Launching
Vehicle



PRC
Bodyguard
Passive
Interference
Device and Laser



Observations

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- Precision targeting system as well as active denial/passive degraders are widely available on both the commercial and international arms markets
- Used throughout the battle space from space to individual soldiers
- Part of a systems of systems approach to weapon development includes the whole of finding targets to destroying them
 - Utilizes all parts of the electromagnetic spectrum
 - Simulation and training aiding in effective use



Mine Clearance

JABS

"EXC

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SMCM/AMCM/UMCM



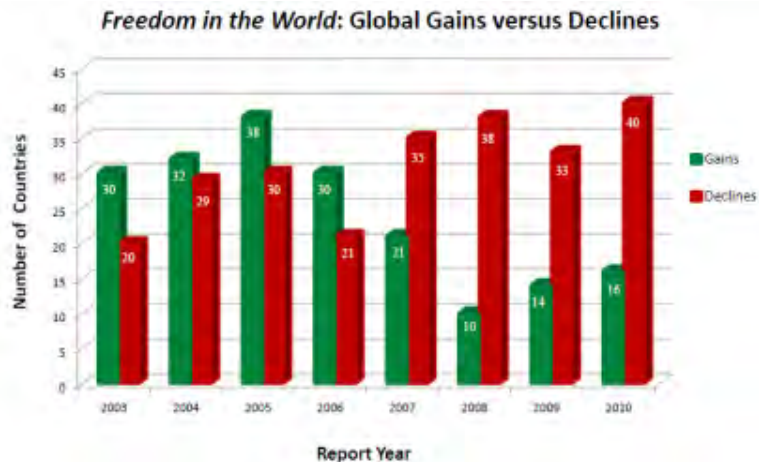
- EODMU ONE provides Navy's sole VSW capability
- VSW clearance critical to Amphibious and SLOC access
- ATF Commander is responsible for Surf Zone and CLZ clearance

Source document: NWP 3-15 Naval Mine Warfare (Mar 2004)



Battle of narratives: Challenges

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"The vast potential of cyberspace can no longer be reserved for dissenting voices. Censoring political and social content with the latest technological tools by arresting and harassing netizens, using omnipresent surveillance and ID registration which compromise surfer anonymity – repressive governments are acting on their threats. **In 2009, some sixty countries experienced a form of Web censorship, which is twice as many as in 2008.**"

"**Only 17 percent of the world's citizens live in countries that enjoy a free press.** In the rest of the world, governments as well as non-state actors control the viewpoints that reach citizens and brutally repress independent voices who aim to promote accountability, good governance, and economic development."

Overall, world freedom has declined in each of last 4 years (2007-2010)

Press freedom declined in each of 7 years from 2001-2008

Worst violators of freedom of expression on the Internet: Saudi Arabia, Burma, China, North Korea, Cuba, Egypt, Iran.

World, press and internet freedoms are declining and are increasingly challenged by state regimes.



Cyber trends: Future

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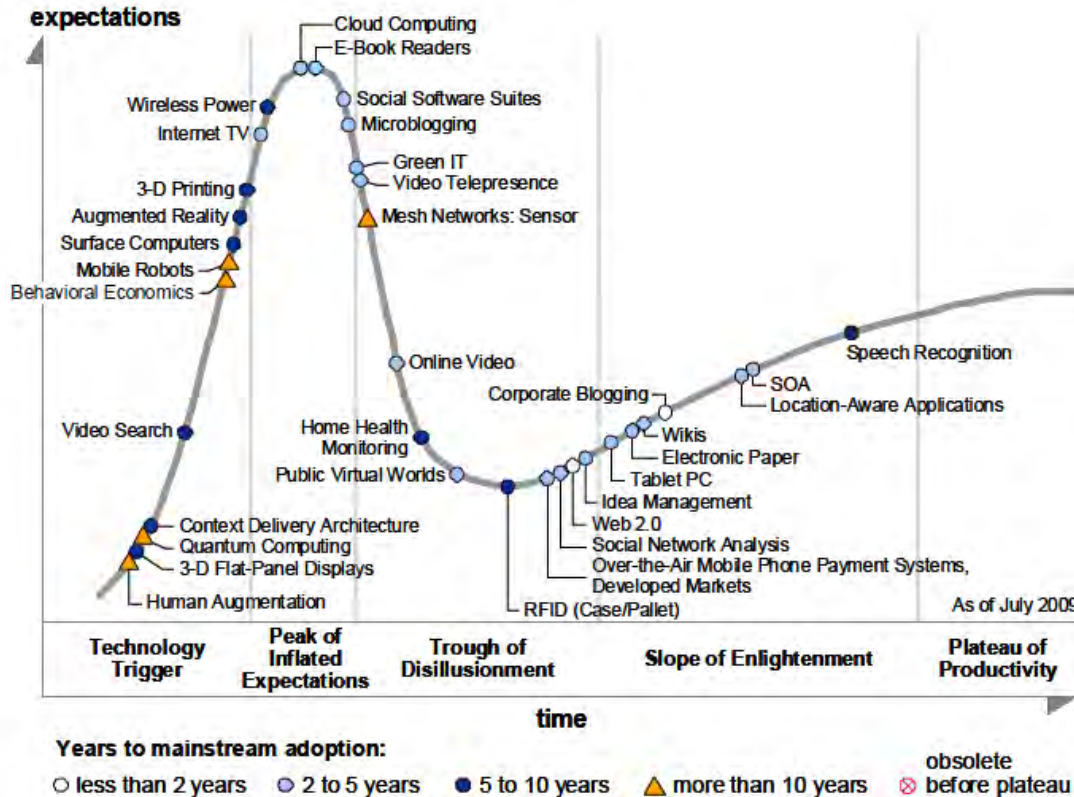
- **Narrowing U.S. technological advantage:** Innovation and R&D will originate from more international and diffuse sources and will proliferate more widely.
- **Embeddedness:** Increasingly, computers and artificial intelligence will be embedded in the local and user environment.
- **Enmeshed networks:** Technology is creating new vulnerabilities in networks and new avenues for cyber attacks.
- **Quantum computing:** Dramatically faster than conventional computers, can impact optimization, code breaking, large-database access, encryption, and pattern matching.
- **Social networking:** Combine two factors that make for an ideal target for online criminal activity: a massive number of users and a high level of trust among those users. Mechanism for voicing dissent. Attack vector for introducing malware.
- **Dual-use technology transfer:** High-performance gaming PCs use the most some of the most powerful processors in the world; networked PCs can be used for attacks.

Cyber trends indicate an erosion of technological dominance and the continued **loss of state control of technology in favor of individuals.**



Forecast: Emerging technologies

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Transformational technologies

- For products, services & commerce: Web 2.0, Public virtual worlds
- IT roles and capabilities: cloud computing, context delivery architectures
- Advances in automation: mobile robots, RFID
- Human capabilities: Human augmentation

Innovations and emerging IT technologies are prevalent in the near, mid and long-term technology scans.



Weaponization of space

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U.S. ASAT demonstrations (1985, 2008)

- Last U.S. anti-satellite (ASAT) test was reported in 1985.
- In 2008, the U.S. shot down an errant satellite using a U.S. Navy SM-3 missile.

"It's becoming increasingly evident that any future war between modern militaries would be both a space war and a cyber war, in fact, they would be one and the same. **Russia, China, and the U.S. have all stated they don't want a space war, but are all preparing for one if one occurs.**"

China's successful anti-satellite test (2007)

- Military purposes:
 - Demonstrate "soft power."
 - Target U.S. ISR and GPS vulnerabilities.
 - Threaten domestic C3 infrastructures.
- Diplomatic purpose: Encourage U.S. to participate in talks on restricting space militarization to erode real and perceived U.S. advantages.
- Continued development of ground-based laser programs.
- "Informatization" policy includes space.

Space's role in military superiority encourages development of strategic countermeasures.



21st Century EMS

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**Electromagnetic Spectrum Control:
Freedom of Action Across ALL Domains**

Intelligence

Fires

Command
&
Control

Maneuver

Logistics

Force
Protection

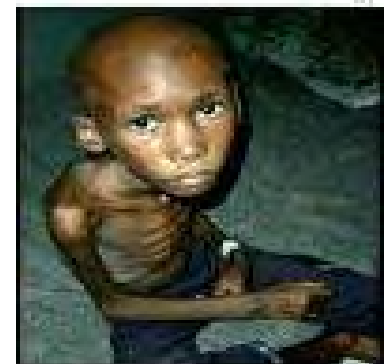




Africa

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- **The potential for USMC engagement in Africa is *high* due to a wide array of destabilizing factors.**
- **Potential roles and missions:**
 - **Military to military engagements** (in the Sahel, West Africa, and North Africa) focused on enhancing regional border security, preventing and interdicting smuggling networks, and preventing the establishment of terrorist safe-havens
 - **Maritime interdiction operations** off the coast of W. Africa, the Gulf of Guinea, and the Horn of Africa to interdict illicit activities and secure economic interests
 - **Humanitarian Assistance and Civil Affairs Operations**, especially in North and Eastern Africa and the Sahel
 - **De-mining and weapons eradication** efforts in West and Central Africa
 - **ISR operations** in North, West, and East Africa





Asia-Pacific

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- *The potential for USMC engagement in the Asia-Pacific Region is **high** due to historical rivalries, regional competition, ethnic/religious tensions, and a variety of economic, political, and social sources of instability.*



- Potential roles and missions:
 - **Theater security cooperation/Building Partner Capacity**, especially in the countries of South and Southeast Asia (Afghanistan, the Philippines, Singapore, Thailand, Indonesia, Cambodia)
 - **Humanitarian Assistance and Disaster Relief**, especially in the archipelagic nations of Southeast Asia (the Philippines, Indonesia, Sri Lanka)
 - **Support to COIN/CT or anti-criminal operations**, especially in countries in South Asia and Southeast Asia
 - **Power projection**, especially in North Asia
 - **Peace-Keeping Operations** in lesser developed states of South Asia and Southeast Asia



Europe/Eurasia

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- *The potential for USMC engagement in the Europe/Eurasia region is **low** due the robust capabilities of regional organizations (primarily NATO and the EU) to respond to conflict without US assistance.*
- Potential roles and missions:
 - **Bi-lateral and Multilateral training**
 - **Support to peace-keeping or stabilization operations**
 - **Theater Security Cooperation/Building Partner Capacity** in Central Asia and the Caucasus, especially Kazakhstan, Kyrgyzstan, and Tajikistan
 - **Support to COIN/CT and counter-criminal operations**
 - **Non-combatant evacuation (NEO)**





Latin America-Caribbean

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- *The potential for USMC engagement in Latin America and the Caribbean is **moderate***
- *Potential roles and missions*
 - **Humanitarian Assistance and Disaster Relief**
(Haiti, Honduras, El Salvador)
 - **Support to COIN/CT and counter-criminal activity**
(Colombia, Caribbean, and Central America)
 - **Theater Security Cooperation/Building Partner Capacity**
(Colombia, Brazil, and Central America)





Middle East

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- *The potential for USMC engagement in the Middle East will be **high** due to historical rivalries, sectarian violence, territorial disputes, and previous US commitments.*
- *Potential roles and missions:*
 - Support to COIN/CT
 - Peacekeeping Operations
 - Combat Operations
 - Counter-WMD/E
 - Humanitarian Support/Disaster Relief
 - Stabilization operations





Summary

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- USMC will be engaged in areas of the world where political, economic, and social instability threaten US national interests
 - Most likely AO will be Middle East, Asia Pacific, and Africa; Significant opportunities in Latin America for TSC/BPC
- Controlling the “narrative” will be key
- The “long war” will require considerations of 2nd, 3rd order effects
- Interagency coordination will be key
- Crisis response and prevention will require the Corps to build upon current capabilities
- Tailored, flexible responses

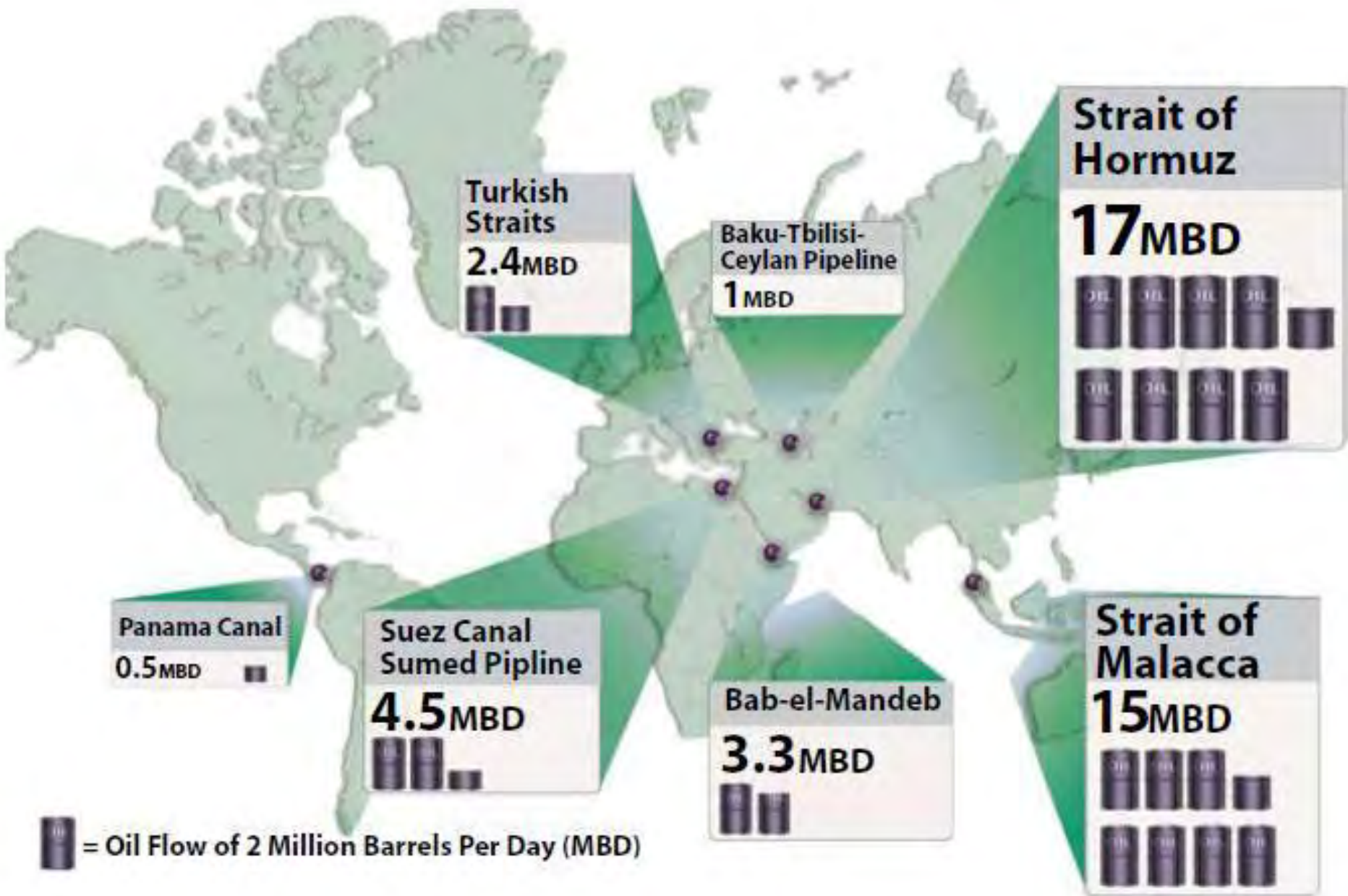



Back-Ups

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- Agreed Borders
- Equidistant Border
- Russian Claimed Territory
- Lomonosov Ridge
- 200-Mile Line



 = Oil Flow of 2 Million Barrels Per Day (MBD)