

Prospective Operations in CSW



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Agenda

- **Relevance and Particularities of CSW**
- **Trends and Implications**
 - **Human Theme**
 - **Political Theme**
 - **Technology Theme**
 - **Economics and Resources Theme**
 - **Environment Theme**
- **Future Demands and Challenges for Operations in CSW**

Confined and Shallow Waters (CSW)

Tidal Areas

Estuaries / Deltas

Narrow Straits, Flats & Reefs

Islands / Archipelagos

Jagged & Rugged Coastlines

Complex Weather & Sea Conditions

Shallow Waters: Depth < 200 m /
600 ft



Worldwide length of Coastlines: approx. 350,000 km

Particularities of CSW

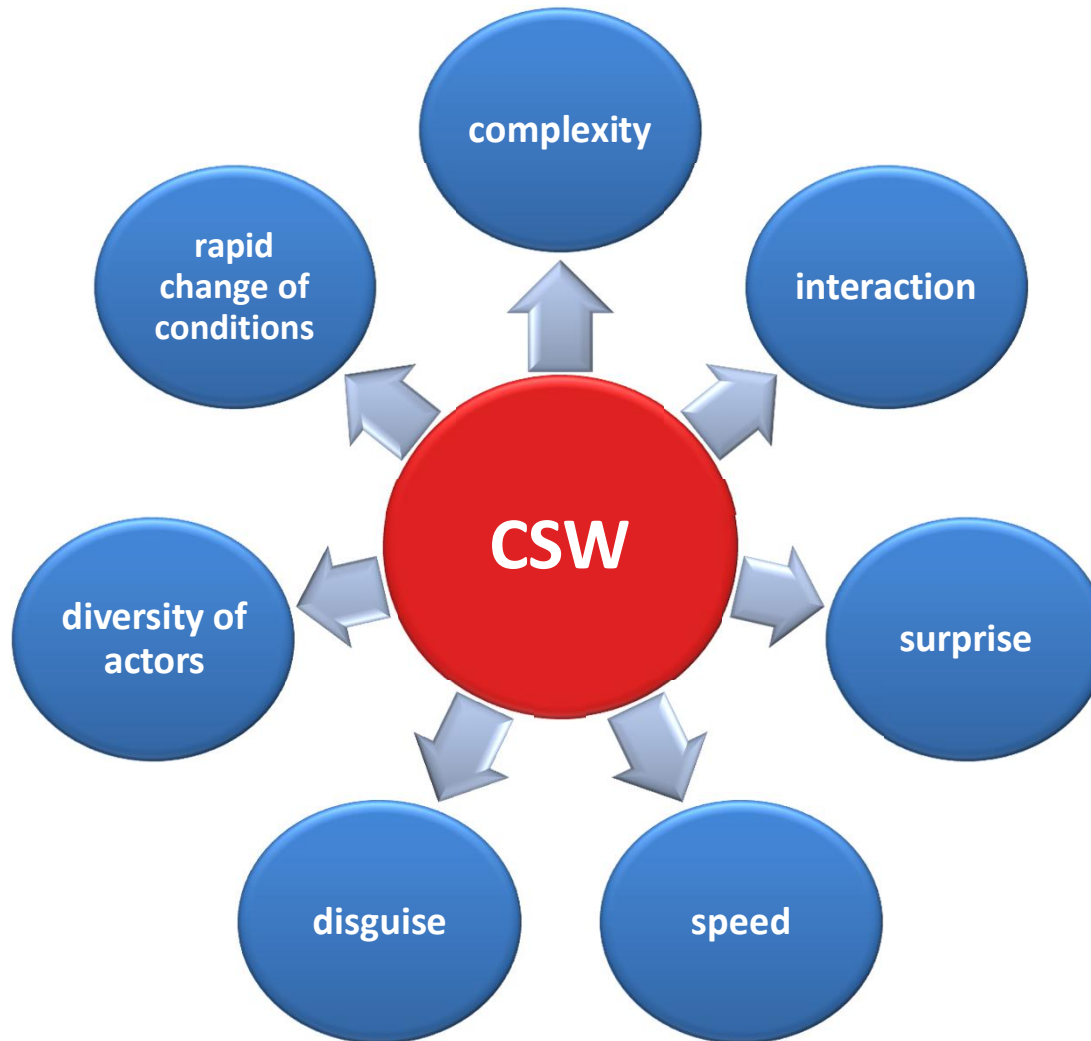
geography

oceanography

meteorology



Particularities of CSW



CSW : Operational Environment

contested,
congested and
cluttered
character

very specific
operational
conditions

a huge variety of
actors

Extremely
challenging
environment

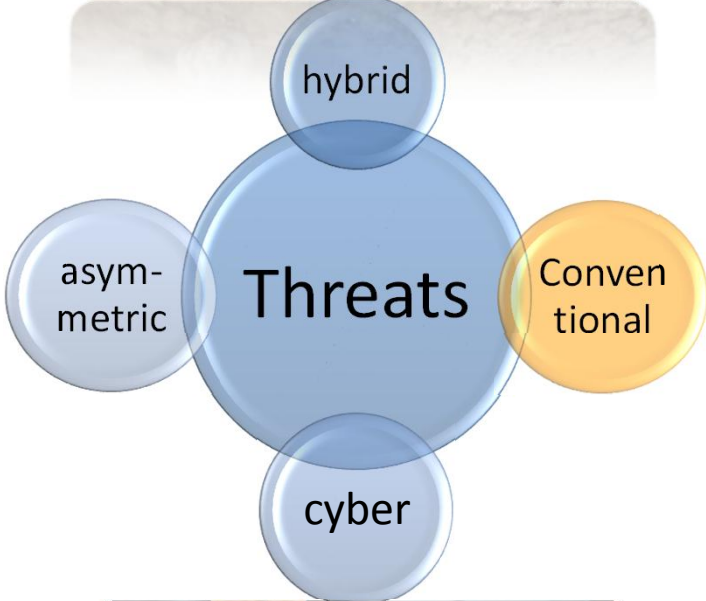


CSW : Operational Environment

- Subject to:
 - many restrictions & limitations
 - manifold **threats & risks**



Risks & Threats



Risks & Threats

- **Risks** in complex CSW battle space may be **mitigated** by;
 - waiving of manned systems,
 - increasingly employing autonomous or remote-controlled systems,
 - ensuring full MSA,
 - sophisticated & layered force protection.



CSW as an Operational Environment

- a **'risk'** for one side may be an **'opportunity'** for the other
- CSW-environment can be exploited in the interests of both sides
- a complementary approach
 - place manifold **challenges & restrictions** that are to be mitigated
 - also offer **advantages** that are to be exploited

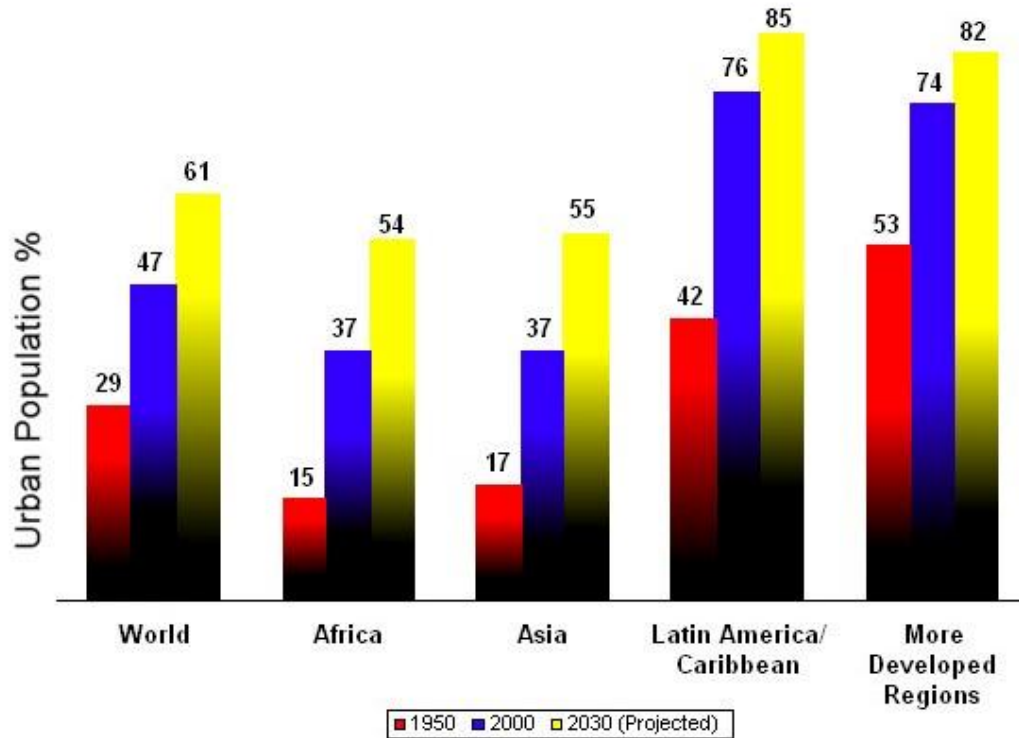


Future Trends and Drivers

- aggravating factors likely to further accentuate the already existing intricacy
- making future operations in CSW even more demanding
- rapid and unpredictable **technological progress** intensifies this development
- increasing relevance of the **cyber domain** that;
 - facilitates a further expansion of human networks,
 - enhances the connectivity.

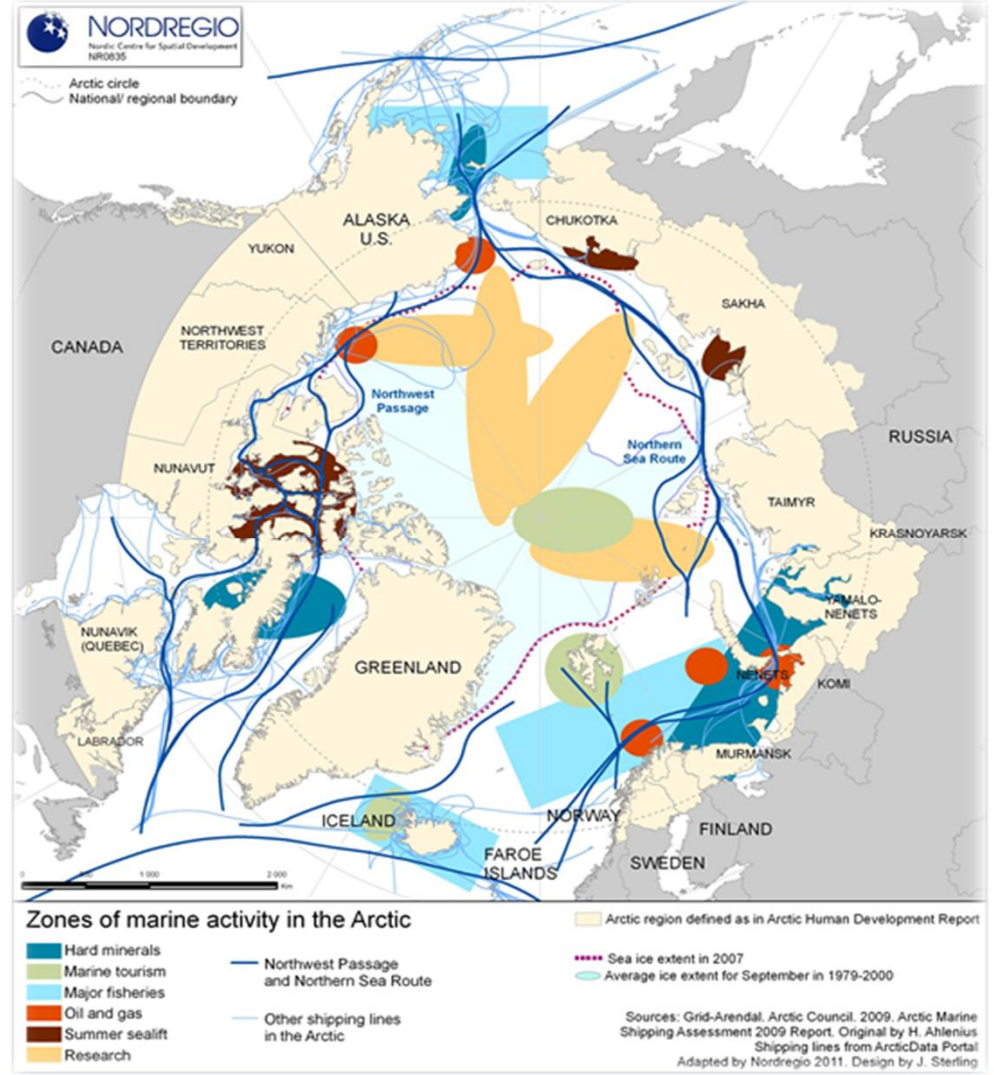
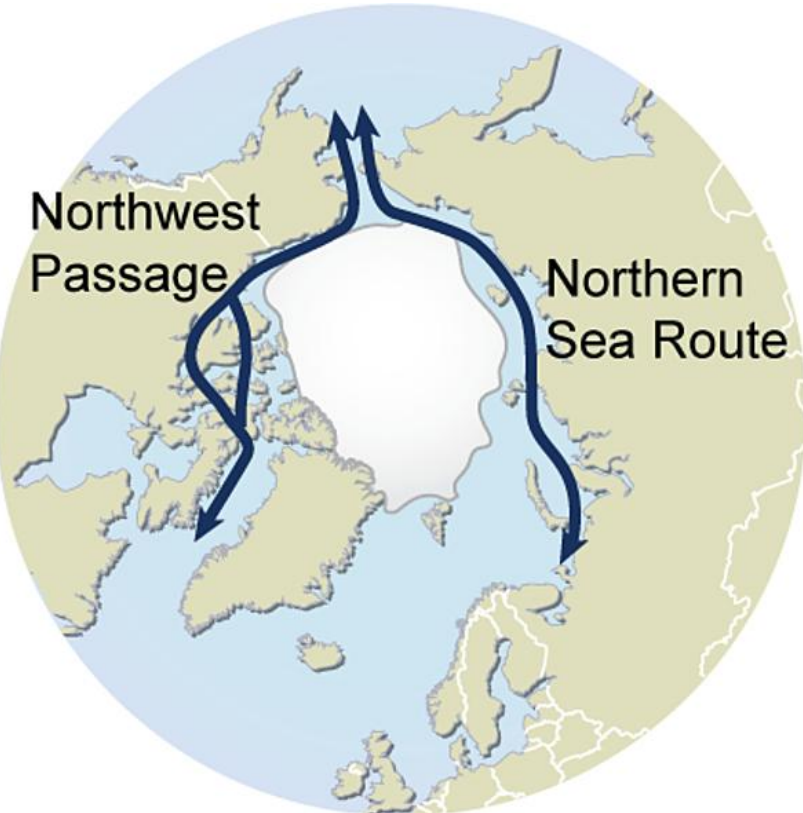
Population Growth & Urbanization

Trends in Urbanization by Region, 2003.



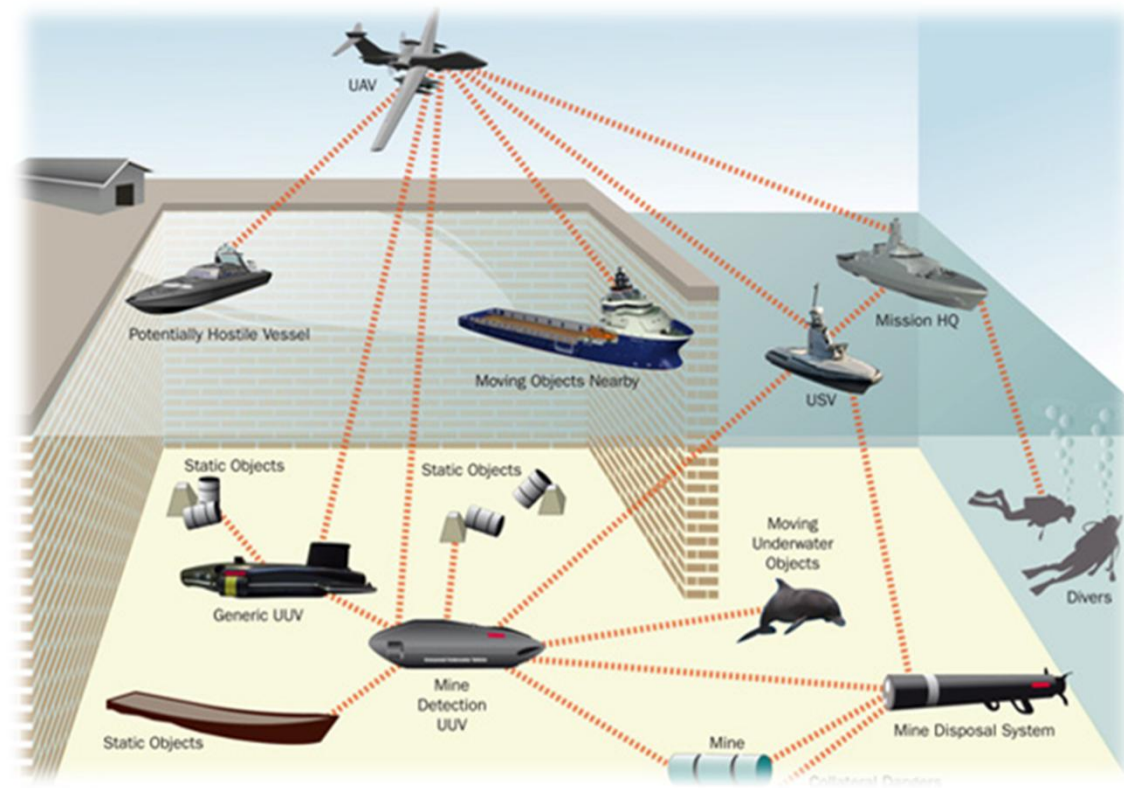
Source: United Nations, World Urbanization Prospects.

Global Warming



Technological Progress

- a key factor influencing the future operations in CSW
- increasing employment of **unmanned & autonomous systems**
 - The legal aspects need to be clarified
 - value for operations in CSW is high
 - open ways to ease some difficulties and major challenges
 - open new operating options in a high risk environment



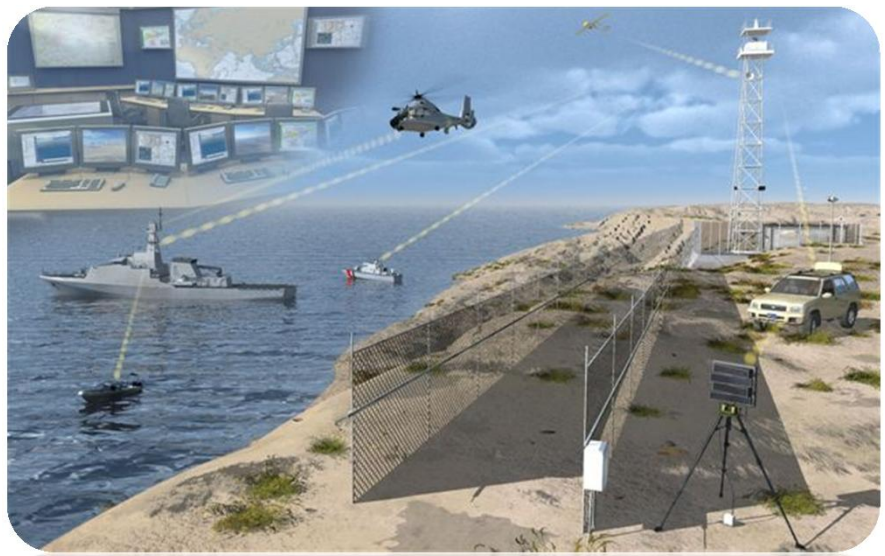
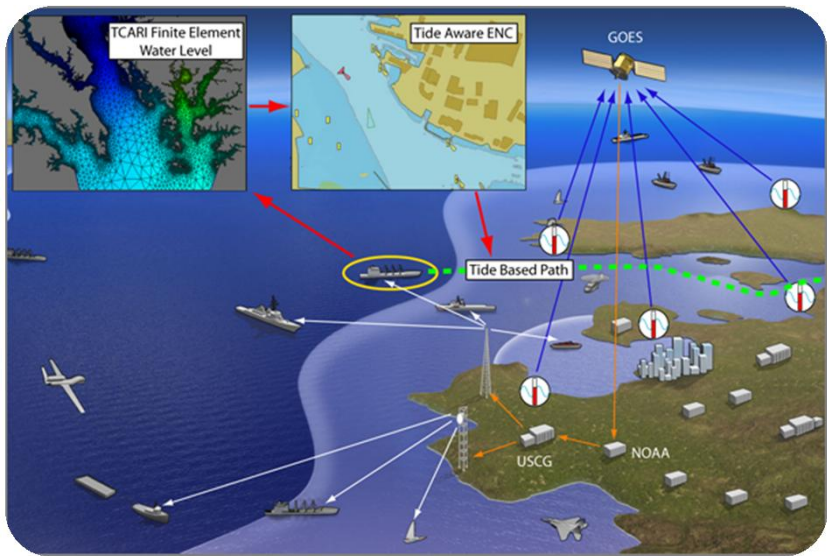
Technological Progress

- development of new tactics and procedures
- dealing with the dissemination of technology and knowledge
- staying on the forefront of technological advancement is critical



Diversity of Actors

- considerably affect the conduct of military operations in CSW
- increasingly shape the character of future conflicts
- **MSA** will be more than ever a key factor especially in CSW
- **Cyber** domain will further gain significance in the future



Command & Control

- **C2 & TTPs** must be further adapted and developed
- A flexible handling of command responsibilities in a decentralized structure is the pre-requisite
- Need for skilled on-scene-commanders remains essential



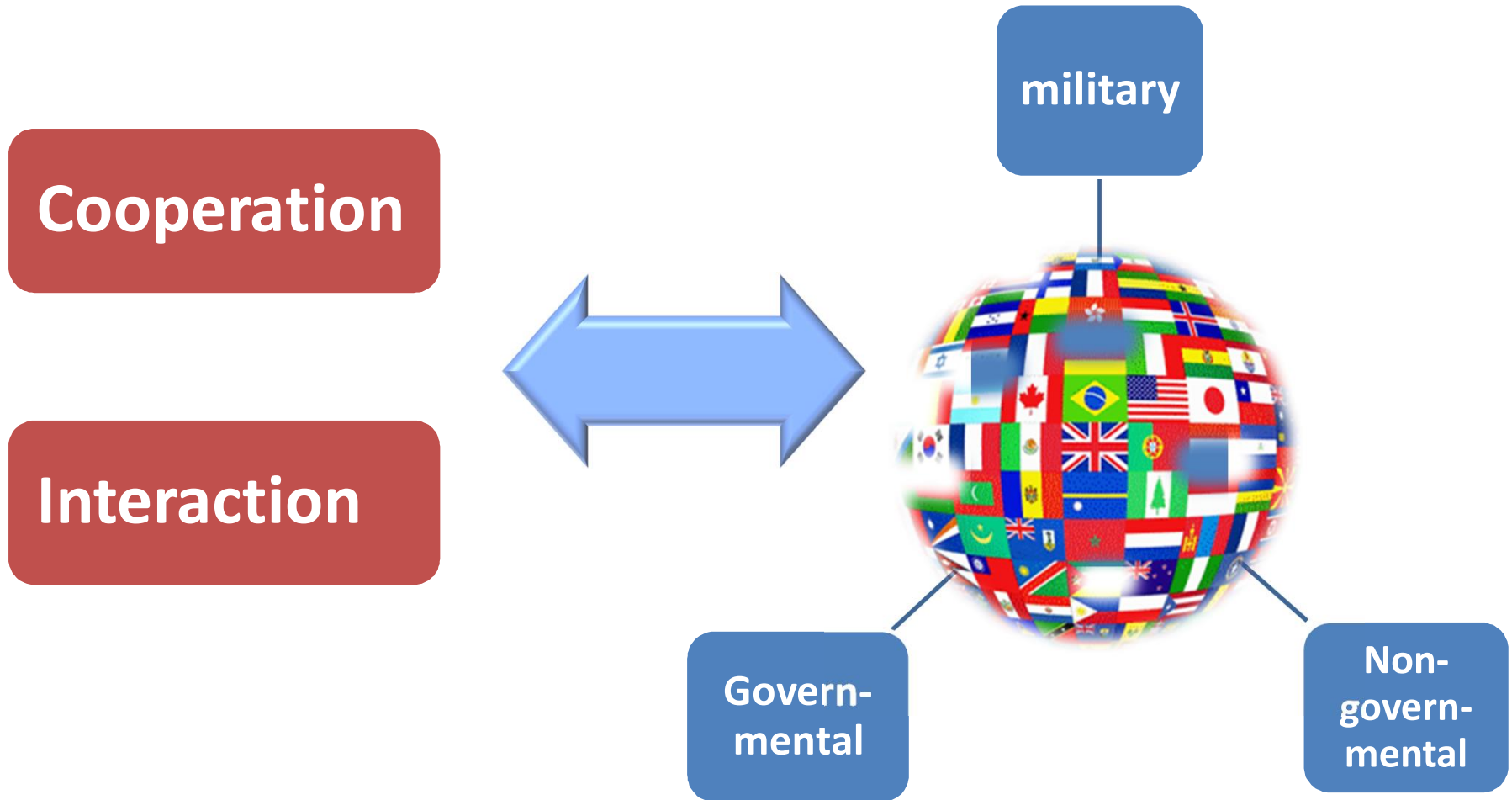
Future Conflicts

- short notice
- rapid escalation
- limited duration
- minimum symmetry
- more complexity
- high intensity
- increased lethality
- collateral damages



- full comprehension of the mission
- full range of operational capabilities
- precise recognized picture
- high readiness
- advanced technology
- adaptive tactics
- agility and flexibility

Future Conflicts



Cornerstones of Future Military Ops

Interoperability

Synergy

Agility

Selectivity

Survivability

Sustainability



Significance & Relevance of CSW

- Significance of the littorals has increased and will increase
- Military relevance of CSW has always remained enormous
- CSW have always been and will be a prominent battle-space at the intersection of all military domains



Operational Requirements



Operational Requirements



Mutual assistance amongst NATO members
(Cooperation)

Modular capabilities with autonomous & unmanned systems

QUESTIONS?



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