Defense Climate Security: *Military Implications in a Changing Climate*

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U.S. Geological Survey

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What is Climate Change?: *Weather, Climate, and Climate Change*

The difference between *weather* and *climate* is a measure of **time**.

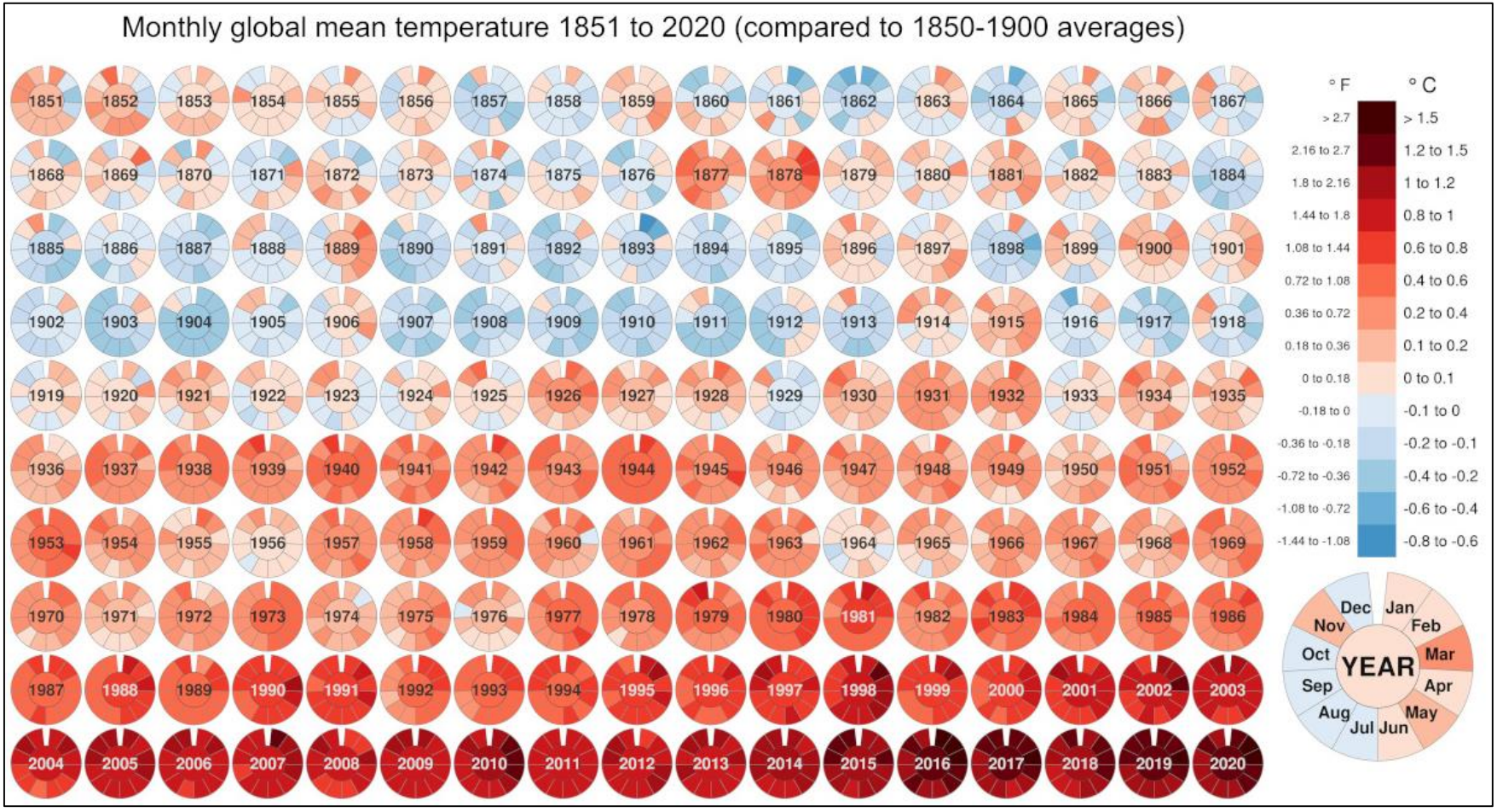
Weather refers to short-term atmospheric conditions at a particular place or region.

Climate is the average of weather over a longer period of time. It is not just the average, but the variability and the extremes. Climate is usually defined for different seasons or months and often averaged over a period of 30 years or more.

Climate change refers to a trend or "change in the state of the climate that can be identified (e.g., using statistical tests) and that persist for an extended period, typically decades or longer."

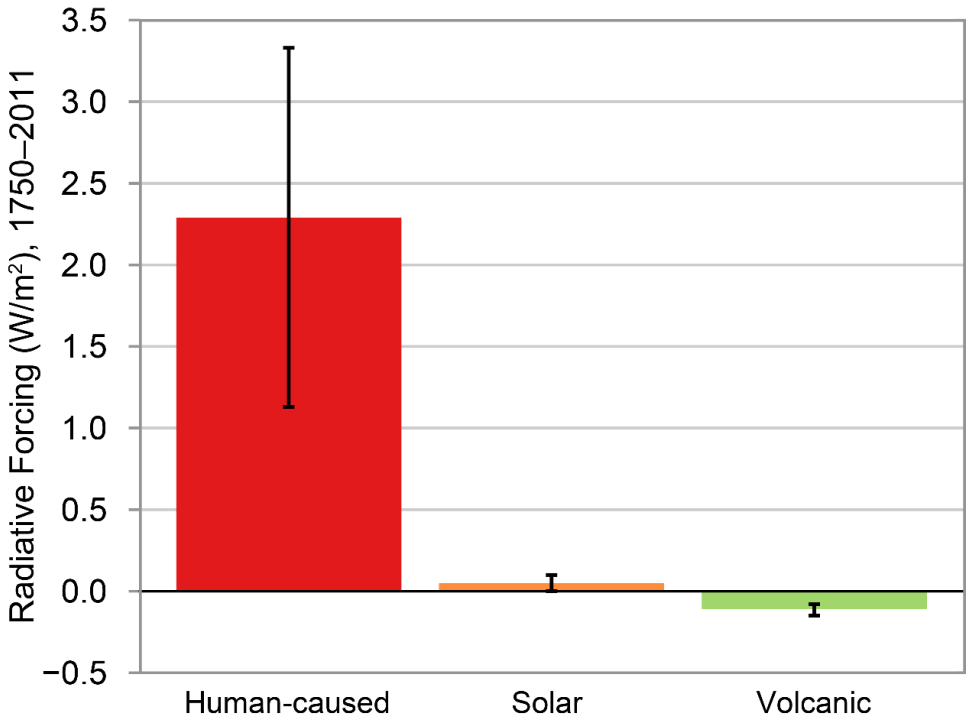
Slide content from a presentation by Dr. Virginia Burkett, USGS (2022)

What is Climate Change?: *Weather, Climate, and Climate Change*



Slide content from a presentation by NOAA's Dr. Wassila Thiaw. Graphic produced by Neil R. Hayes and published by Iman Ghosh from Visual Capitalist

Human Activities are the Primary Driver of Recent Global Temperature Rise



"*We find no convincing evidence that natural variability can account for the amount of global warming observed over the industrial era….. Solar output changes and internal variability can only contribute marginally to the observed changes in climate over the last century, and we find no convincing evidence for natural cycles in the observational record that could explain the observed changes in climate. (Very high confidence)*" (NCA4, Vol. I, 2017)

USGS

Slide content from a presentation by Dr. Virginia Burkett, USGS (2022)

What is Climate Change?: *Definitions in Policy and Doctrine*

- *Climate change refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, such as through variations in the solar cycle. But since the 1800s, human activities have been the main driver of climate change, primarily due to burning fossil fuels like coal, oil and gas.* ***(United Nations)***

- *"Climate change" means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.* ***(UNFCCC)***

- *Variations in average weather conditions that persist over multiple decades or longer that encompass increases and decreases in temperature, shifts in precipitation, and changing risk of certain types of severe weather events.* ***(DoDD 4715.21, Joint Publication (JP) 1-02; U.S. Global Change Research Program)***

Climate Change and Global Change

Global Change: *Changes in the global environment that may alter the capacity of the Earth to sustain life.* ***Global change encompasses climate change, but it also includes other critical drivers of environmental change that may interact with climate change****, such as land use change, the alteration of the water cycle, changes in biogeochemical cycles, and biodiversity loss****.***

-U.S. Global Change Research Program

A Quick Aside on Climate Change

1. **Climate change is not just something with future implications.**
   - The future will see more extreme manifestations of climate change
   - But damaging effects of climate change are already visible
   - Some contemporary impacts result from **climate change that has already happened**
2. **Climate produces impacts regardless of human attribution.**
   - Human attribution is just the main culprit of contemporary change
   - Human attribution is what can be controlled the most
3. **Climate change is not the problem.**
   - The Earth's Climate System works to distribute the amount of heat energy on planet
   - Climate change is a natural response to changes in Earth's heat energy
   - Human emissions/activity directly influenced increases in Earth's heat energy
   - Human contributions accelerated ***the rate of climatic change***
4. **Climate change has cascading impacts on natural and human vulnerabilities.**

What is Climate Security?

The term "climate security" means the effects of climate change on the following:

A. The national security of the United States, including national security infrastructure.

B. Subnational, national, and regional political stability.

C. The security of allies and partners of the United States.

D. Ongoing or potential political violence, including unrest, rioting, guerrilla warfare, insurgency, terrorism, rebellion, revolution, civil war, and interstate war.

The Three Faces of Climate Security

(Beauregard, 2020, Modern War Institute)

Environmental	Human	Geopolitical*
Environmental **events/phenomena**	**Human development** conditions	**Governance** and intention
Attribution to routine, extreme, or anthropogenic climate variability	**Climate and environmental exposure & risks** to human development	**Resources** and infrastructure
Understanding ***non-climatic*** environmental symptoms	**Adaptive and contributory*** behavior	**Activity,** to include planning, prioritization, and actions

Geographic variability

Measuring Military Implications:
*Military Readiness**

- ***Readiness:*** *the ability of military forces to fight and meet the demands of assigned missions* ***(DOD Joint Publication 1)***

- Not specified, but included in this perspective (according to **U.S. Congressional Research Service, 2020**):

  - Assigned missions support **fulfillment of national strategy** (codified in policy)

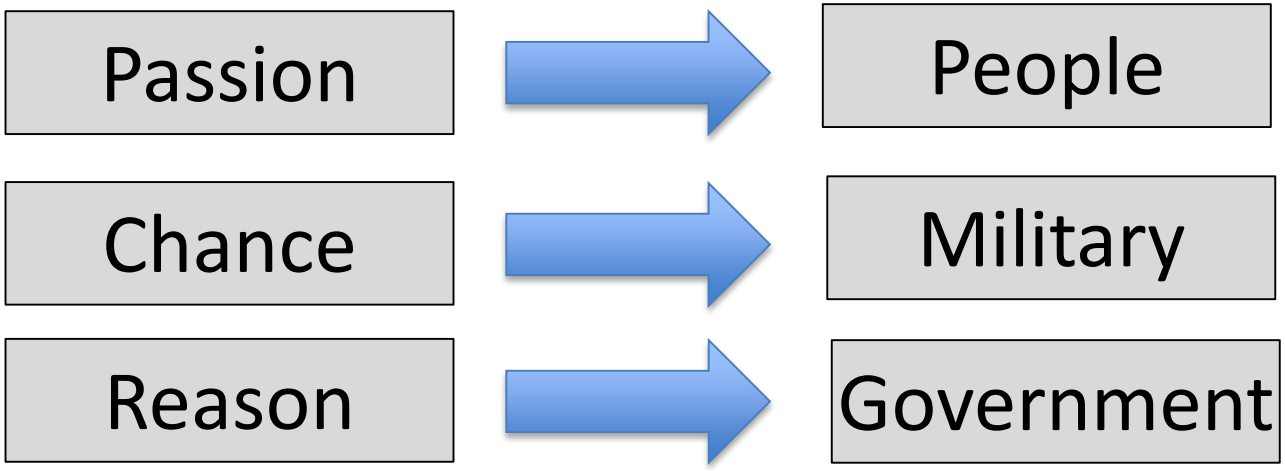
  - Focus on military forces and those force's **ability** to fight and win, **anywhere,** and at **any time**

*Relies on U.S. definitions

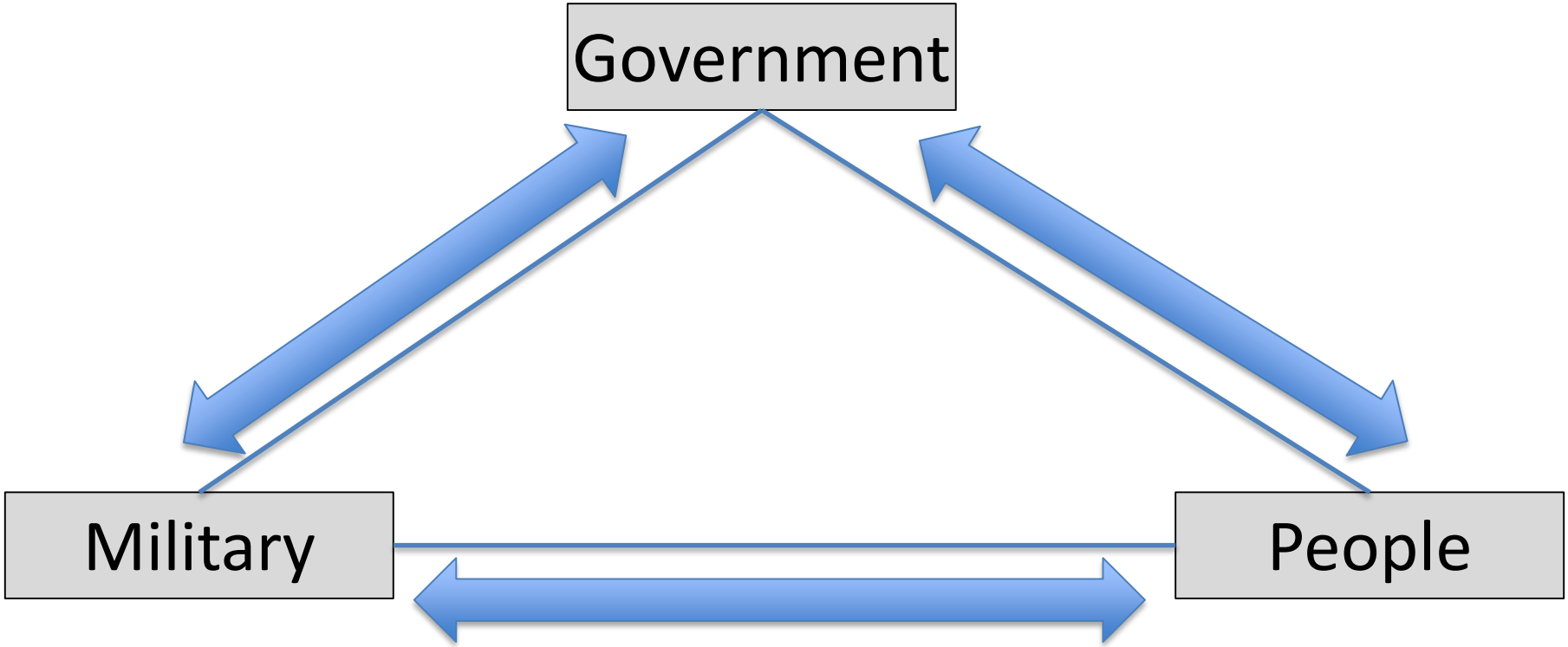
Measuring Military Implications:
The Clausewitzian Trinity

- Three elements interact to affect the outcome of war:
  - **Passion:** primordial violence, hatred, and enmity
  - **Chance:** the friction, ambiguity, and 'fog' of war
  - **Reason:** war's subordination to policy and decision-making

-Carl von Clausewitz, *On War*



Measuring Military Implications:
The Clausewitzian Triangle



*Measuring Military Implications: PROPs**

*Will depend on the **environment**, the **time**, the **objective**, and the **level of war** (strategic, operational, tactical)*

Policy (P)	Resources (R)	Operations (O)	Partnerships (P)
National Policy	Infrastructure	Combat	Public-Private
Authorities	Information	Stability	Security-Science
Budget	Personnel	Freedom of navigation	Civil-Military
Strategy & Priority	Materiel	Humanitarian	Military-Military
Plans & Actions	Energy	Law enforcement*	Defense-Diplomacy-Development

*This is a very nascent framework to support understanding and is open to revision

Defense Climate Security

The extent to which changes in global, regional, national, and sub-national climate conditions affects ***defense and military activities****.*

Environmental	Human	Geopolitical
Environmental **events/phenomena**	**Human development** conditions	**Governance** and intention
Attribution to routine, extreme, or anthropogenic climate variability	**Climate and environmental exposure & risks** to human development	**Resources** and infrastructure
Understanding ***non-climatic*** environmental symptoms	**Adaptive and contributory*** behavior	**Activity,** to include planning, prioritization, and actions
Geographic variability		

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National Policy	Infrastructure	Combat	Public-Private
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Case Study:
Russian Defense Climate Security

Russian Military Districts (Source: Wikipedia). *Map depicts the geographic division of Russia's military districts. The Western Military District (red) is headquartered in St. Petersburg. The Southern Military District (brown) is headquartered in Rostov-na-Donu. The Northern Military District (blue) is the newest and also known as Northern Fleet Joint Strategic Command – based in Severomorsk. The Central Military District (green) is headquartered in Yekaterinberg, and the Eastern Military District (orange) is headquartered in Khabarovsk.*

Case Study:
Russian Defense Climate Security

Face	Policy (P)	Resources (R)	Operations (O)	Partnerships (P)	Overall (Face)
Environmental (ENVT)					
Human (HUM)					
Geopolitical (GEO)					
Overall (Indicator)					

Military Readiness Indicator Ratings

YES: Indicator observed + high quality or high potential* **(+2)**
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Analytic Targets

NAT: National rating
MIL: Military rating
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Scale: SEVERE (<0-2) | LOW (3-4) | MODERATE (5-6) | HIGH (7-8) | VERY HIGH (9-10+)

Case Study:
Russian Defense Climate Security

ENVT	HUM	GEO*
Symptoms: Temperature, disasters, permafrost thaw, land subsidence *(Arctic)*	**Development:** Advanced expertise; wide educational access; health insecurity; demographic insecurities; public safety; protests	**Governance:** Party to climate treaties, but high corruption/mismanagement; political repression; low will
Attribution: at least partial attribution to both routine/extreme and anthropogenic climate change	**Exposure:** Permafrost → anthrax & residential, military, and critical infrastructure damage; Wildfires → smoke inhalation; Temperatures → indigenous populations	**Resources:** Fossil-fuel reliant economy; Ukraine; lack of climate & environmental investment/appropriation; infrastructure outdated
Non-climatic: Pollution, logging/deforestation, ecological hazards	**Behavior:** fossil-fuel reliant livelihoods; nascent activism; some brain drain; indigenous impacts	**Activity:** stalled Arctic Council engagement; pivoting towards other countries; military forces diverted from wildfire response; COVID response mismanagement

Case Study:
Russian Defense Climate Security

Face	Policy (P)	Resources (R)	Operations (O)	Partnerships (P)	Overall (Face)
ENVT	3	5	3	4	15
HUM	-4	6	2	-1	3
GEO	-1	-1	4	1	3
Overall (Indicator)	-3	10	9	4	20

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Russian Defense Climate Security:
Notional Key Takeaways

Russia <u>currently</u> has the inherent national and military resources and capabilities to respond to <u>near-term</u>, <u>seasonal</u>, and <u>domestic</u> environmental and climate hazards and will likely rely on this response capacity for the foreseeable future.

- *Training & experience in disaster & maritime operations*
- *Advanced weather, environment, and climate science expertise*
- *Mineral and energy resources abundance for energy transition*
- *Political authority to dictate decisive action and investment*
- *Political attention to natural disasters* ***when visibility evolves***

Russian Defense Climate Security:
Notional Key Takeaways

Russia lacks political, economic, military, and diplomatic incentive to prioritize those capabilities and resources towards current and projected climate and environmental impacts to its population, infrastructure, and operations.

- *Ukraine (policy, budget, diplomatic decline)*
- *Diplomatic alternatives to sustain its fossil fuel economy*
- *Little human and health security investment domestically*
- *Military development in the Arctic to exploit melting ice*
- *Denial of climate impacts to reported infrastructure damage*
- *Lack of environmental, climate, and human concern in combat*
- *Lack of influence of sanctions on political decision-making*
- *Persistent corruption and political insecurity*
- *Hydrocarbon reserves in the permafrost*

Russian Defense Climate Security:
Notional Key Takeaways

Left unaddressed, the anticipated intensity and duration of environmental impacts from climate change – <u>compounded with diverted military and political prioritization</u> – could lead to climate change overwhelming or reducing effectiveness of Russian government and military reactive climate security operations on which they seem to rely.

- *Future & current direct climatic threats to infrastructure*
- *Observed risks to public health*
- *Emigration of scientific experts who could inform resilience*
- *Stalled or cancelled scientific diplomacy*
- *Disbursement of limited military resources*
- *Energy transition implications for Russian economy*

In Summary

- *Climate change poses challenges for **physical, human, and institutional** operating environments for global militaries*

- *Climate change implications for military operations must be understood based on how they **affect and are affected by** governmental **and** human implications from climate change*

- *The **capability** to be ready for climate security impacts means little in the absence of national and military **intention** to acknowledge and address it.*

- ***Even in the absence of political direction,** militaries can enhance their defense climate security by understanding how climate change-related activities support their existing authorities and directives.*

- *A particular country, community, region, or organization's climate security relies on international and domestic political, military, societal, and scientific partnerships.*

Thank you!

Case Study Analysis (Backup Slides)

Not part of the main presentation unless prompted in Q&A

Russian Defense Climate Security:
PROPs Framework

Policy (P)	Resources (R)	Operations (O)	Partnerships (P)
National Policy	Infrastructure	Combat	Public-Private
Authorities	Information	Stability	Security-Science
Budget	Personnel	Freedom of navigation	Civil-Military
Strategy & Priority	Materiel	Humanitarian	Military-Military
Plans & Actions	Energy	Law enforcement*	Defense-Diplomacy-Development

Russian Defense Climate Security:
Policy

Face	National Policy	Authorities	Budget	Strategy & Priority	Plans & Actions	Overall (Face)
ENVT	OVE: PAR NAT: PAR MIL: PAR	OVE: PAR NAT: YES MIL: PAR	OVE: PAR NAT: PAR MIL: PAR	OVE: NO NAT: PAR MIL: NO	OVE: PAR NAT: PAR MIL: PAR	3
HUM	OVE: NO NAT: PAR MIL: NO	OVE: PAR NAT: YES MIL: PAR	OVE: NO NAT: PAR MIL: NO	OVE: NO NAT: PAR MIL: NO	OVE: NO NAT: NO MIL: NO	-4
GEO	OVE: PAR NAT: PAR MIL: PAR	OVE: PAR NAT: YES MIL: PAR	OVE: NO NAT: NO MIL: NO	OVE: NO NAT: NO MIL: NO	OVE: NO NAT: NO MIL: NO	-1

YES: +2 PAR: +1
NO: -1 UNK: 0

Scale: SEVERE (<0-2) | LOW (3-4) | MODERATE (5-6) | HIGH (7-8) | VERY HIGH (9-10+)

Case Study:
Russian Defense Climate Security

Face	Policy (P)	Resources (R)	Operations (O)	Partnerships (P)	Overall (Face)
ENVT	3				
HUM	-4				
GEO	-1				
Overall (Indicator)	-3				

Military Readiness Indicator Ratings

YES: Indicator observed + high quality or high potential* **(+2)**
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Authorities	Information	Stability	Security-Science
Budget	Personnel	Freedom of navigation	Civil-Military
Strategy & Priority	Materiel	Humanitarian	Military-Military
Plans & Actions	Energy	Law enforcement*	Defense-Diplomacy-Development

Russian Defense Climate Security:
Resources

Face	Infrastructure	Information	Personnel	Materiel	Energy	Overall (Face)
ENVT	OVE: PAR NAT: PAR MIL: PAR	OVE: PAR NAT: YES MIL: PAR	OVE: PAR NAT: YES MIL: PAR	OVE: PAR NAT: YES MIL: PAR	OVE: PAR NAT: YES MIL: PAR	5
HUM	OVE: PAR NAT: YES MIL: PAR	OVE: YES NAT: YES MIL: YES	OVE: PAR NAT: PAR MIL: PAR	OVE: PAR NAT: PAR MIL: PAR	OVE: PAR NAT: PAR MIL: PAR	6
GEO	OVE: PAR NAT: PAR MIL: PAR	OVE: PAR NAT: PAR MIL: NO	OVE: NO NAT: PAR MIL: NO	OVE: NO NAT: NO MIL: NO	OVE: NO NAT: NO MIL: NO	-1

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Case Study:
Russian Defense Climate Security

Face	Policy (P)	Resources (R)	Operations (O)	Partnerships (P)	Overall (Face)
ENVT	3	5			
HUM	-4	6			
GEO	-1	-1			
Overall (Indicator)	-3	10			

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Russian Defense Climate Security:
PROPs Framework

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National Policy	Infrastructure	Combat	Public-Private
Authorities	Information	Stability	Security-Science
Budget	Personnel	Freedom of navigation (FONOPs)	Civil-Military
Strategy & Priority	Materiel	Humanitarian (HADR)	Military-Military
Plans & Actions	Energy	Law enforcement* (LEO)	Defense-Diplomacy-Development

Russian Defense Climate Security:
Operations

Face	Combat	Stability	FONOPs	HADR	LEO	Overall (Face)
ENVT	OVE: NO NAT: NO MIL: NO	OVE: NO NAT: NO MIL: NO	OVE: YES NAT: YES MIL: YES	OVE: YES NAT: YES MIL: YES	OVE: PAR NAT: YES MIL: PAR	3
HUM	OVE: NO NAT: NO MIL: NO	OVE: PAR NAT: PAR MIL: PAR	OVE: UNK NAT: UNK MIL: UNK	OVE: PAR NAT: PAR MIL: PAR	OVE: PAR NAT: PAR MIL: PAR	2
GEO	OVE: PAR NAT: PAR MIL: PAR	OVE: PAR NAT: YES MIL: PAR	OVE: YES NAT: YES MIL: YES	OVE: PAR NAT: PAR MIL: PAR	OVE: NO NAT: NO MIL: NO	4

YES: +2 PAR: +1
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Case Study:
Russian Defense Climate Security

Face	Policy (P)	Resources (R)	Operations (O)	Partnerships (P)	Overall (Face)
ENVT	3	5	3		
HUM	-4	6	2		
GEO	-1	-1	4		
Overall (Indicator)	-3	10	9		

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Authorities	Information	Stability	Security-Science
Budget	Personnel	Freedom of navigation	Civil-Military
Strategy & Priority	Materiel	Humanitarian	Military-Military
Plans & Actions	Energy	Law enforcement*	Defense-Diplomacy-Development (DDD)

Russian Defense Climate Security:
Partnerships

Face	Public-Private	Security-Science	Civil-Military	Military-Military	DDD	Overall (Face)
ENVT	OVE: YES NAT: YES MIL: YES	OVE: UNK NAT: UNK MIL: UNK	OVE: YES NAT: YES MIL: YES	OVE: PAR NAT: YES MIL: NO	OVE: NO NAT: NO MIL: NO	4
HUM	OVE: PAR NAT: PAR MIL: PAR	OVE: NO NAT: PAR MIL: NO	OVE: NO NAT: PAR MIL: NO	OVE: NO NAT: NO MIL: NO	OVE: PAR NAT: PAR MIL: PAR	-1
GEO	OVE: PAR NAT: PAR MIL: UNK	OVE: PAR NAT: PAR MIL: PAR	OVE: PAR NAT: PAR MIL: PAR	OVE: NO NAT: NO MIL: NO	OVE: NO NAT: PAR MIL: NO	1

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