U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND –
ARMY RESEARCH LABORATORY

Karabakh War of 2020: S&T Implications

(Note: These slides are intended only as part of an oral presentation. They should not be used or interpreted as a stand-alone document.)

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HISTORICAL ANALOGY: RUSSO-JAPANESE WAR – THE FIRST TRUE WAR OF THE 20TH CENTURY

- **Feb 1904 – Sep 1905, Manchuria and Korea, troops: 700K (Russ.), 650K (Jap.)**

- **Major new phenomenon: massive, effective use of machine guns;**

- **Widely observed, reported, limited conclusions. "…European and American militaries have little to learn from this peculiar Asiatic war…"**

- **Massive, effective use of machine guns:**

  → demise of (unprotected) direct-fire, demise of horse cavalry
  → need for tanks → anti-tank weapons

  → growth of indirect fires → aerial observation → counter-air

"That war was a canary in a mine, but they didn't listen…"

KARABAKH WAR -- THE FIRST TRUE WAR OF THE 21ST CENTURY

- **Sep-Nov 2020, Nagorno-Karabakh Mtns, troops: 150K (Azerbaijan), 50-70K (Armenia) [huge numbers in proportion to population]**

- **KIA: ~2,900 (AZE); ~3,400-4,700 (ARM) [ditto]**

- **Major new phenomenon: the bulk of lethality is by unmanned systems**

- **Other significant observations:**
  - Massive defeat of ARM armor, art'y, logistics by AZE unmanned systems
  - Major role of AZE infantry infiltration tactics, using most difficult terrain
  - Significant use of long range fires
  - Very few direct-fire armor engagements
  - No use of conventional air assets (rotor or fixed-wing)
  - ARM air-defense, even modern, ineffective against AZE unmanned systems
  - Ditto: EW ineffective against unmanned systems
  - Difficulties in ARM use of camouflage, obscurants and decoys
  - Low civilian casualty rate; all due to conventional weapons
  - No claims of civilian deaths due to unmanned systems

Based on, or estimated from, open sources. Accuracy is uncertain.

THE GEOGRAPHIC AREA

Since early 1990's, south-western corner of Azerbaijan (Nagorno-Karabakh in Russian, Qarabağ in Azeri; Gharabagh in Armenian) was controlled by unrecognized Republic of Artzakh, an ethnic Armenian enclave supported by Armenia. About 100 km East-to-West, 150 km South-to-North.
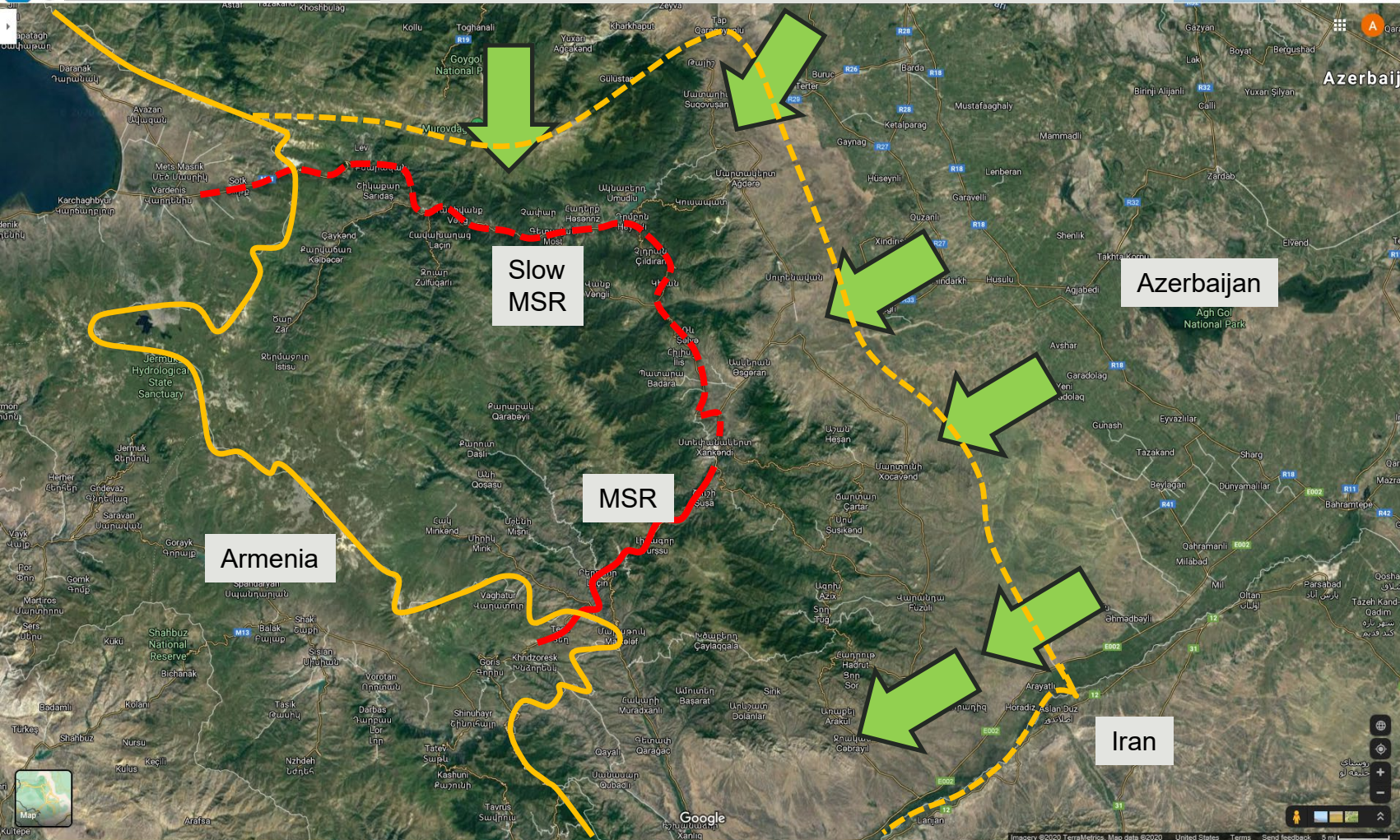
Approximate timeline:
Sep27-Oct04 – AZE forces attack along the perimeter of Karabakh, by Oct04 break thru ARM defenses in Aras river valley, take Jebrail, cutting southern supply routes.

Approximate timeline:
Oct05-14 – AZE forces attack North from Aras valley and take Hadrut, secure their right flank.
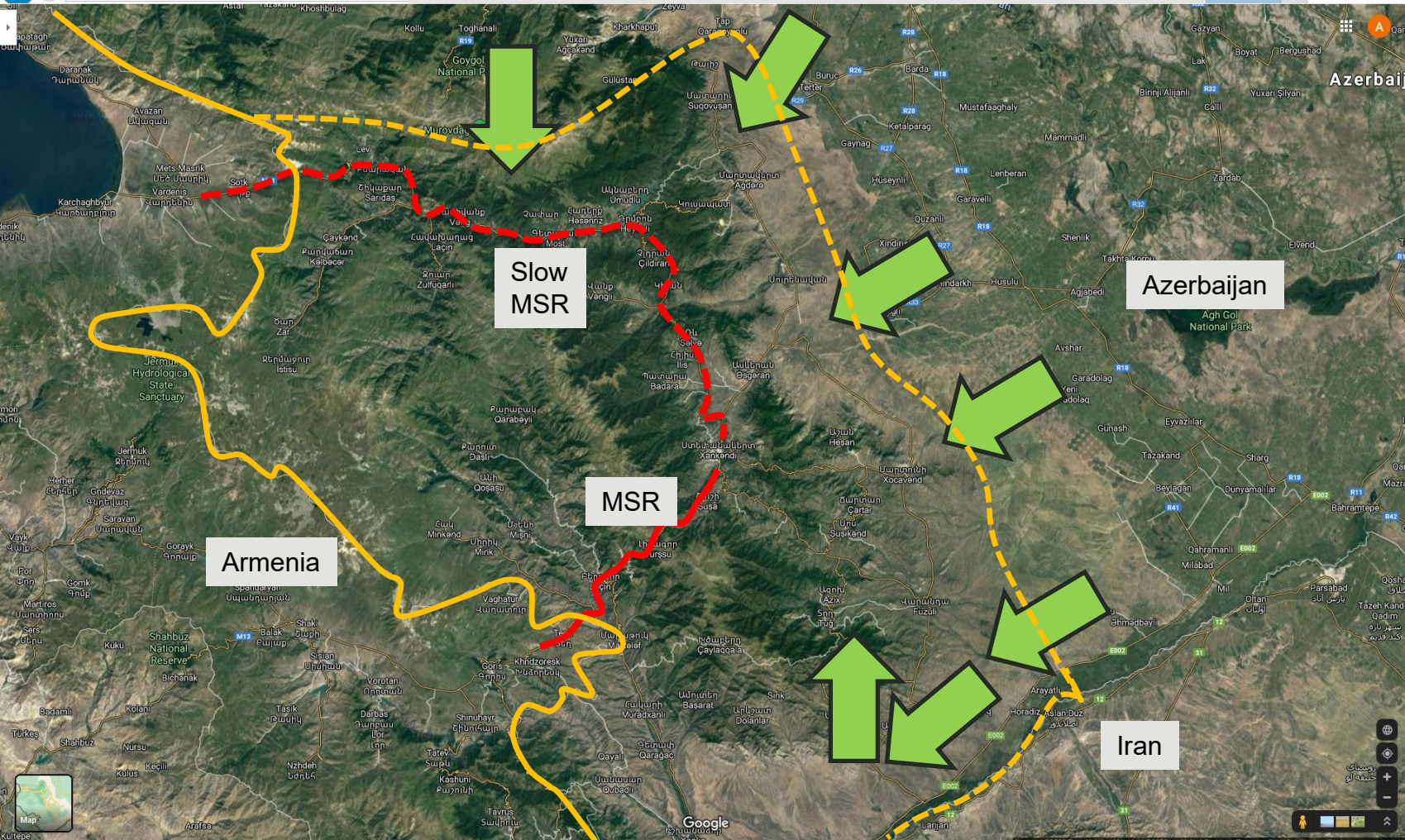
Approximate timeline:
Oct15-20 – AZE forces continue to advance along the Aras valley and take Zangelan. Karabakh is now isolated from Iran.
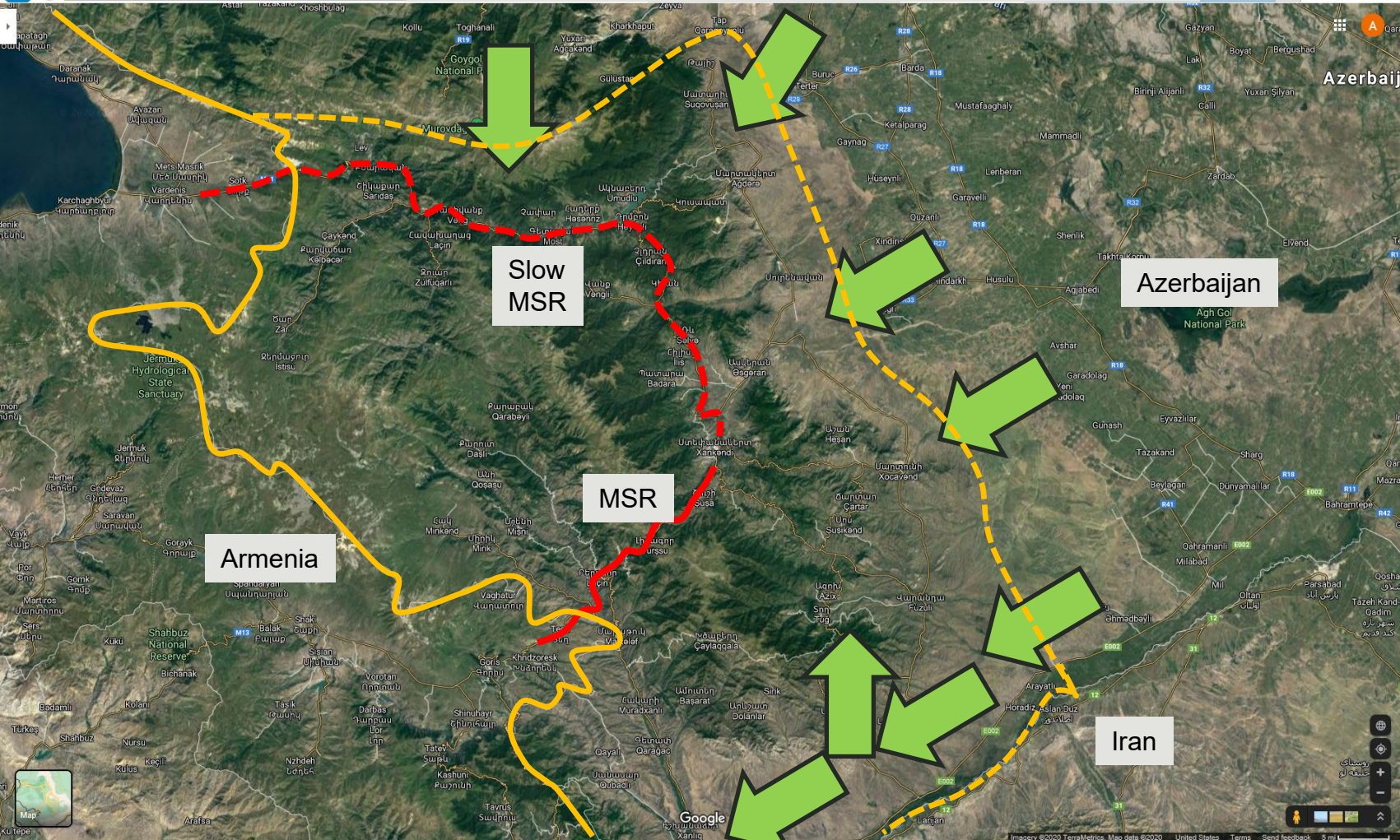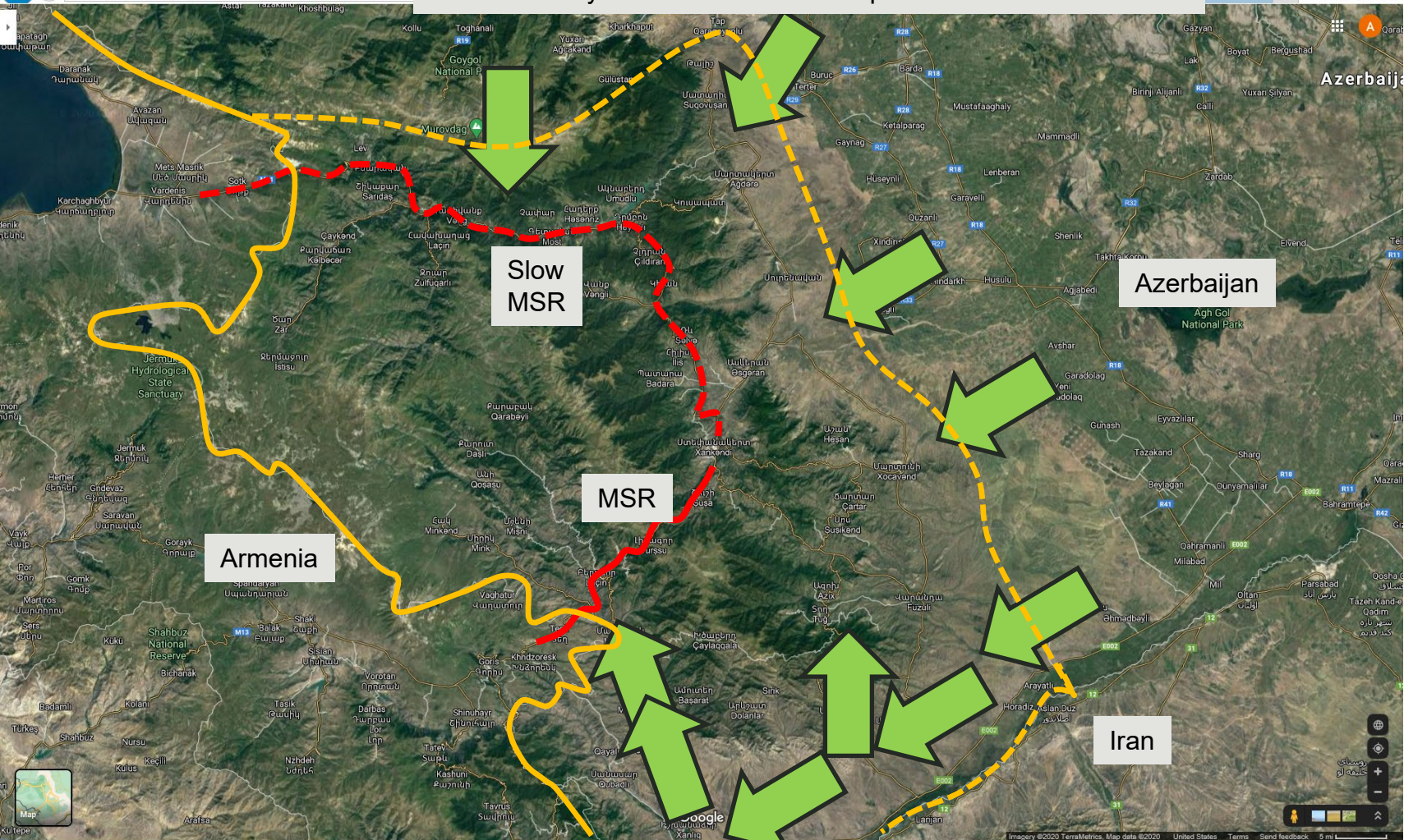
Slow MSR

MSR

Azerbaijan

Armenia

Iran

Approximate timeline:
Oct21-23 – AZE forces advance North along the boundary of Armenia proper, approach Lachin. ARM forces manage to stop the advance of AZE before they sever the MSR. AZE is constrained by Russian and ARM troops on the left flank.
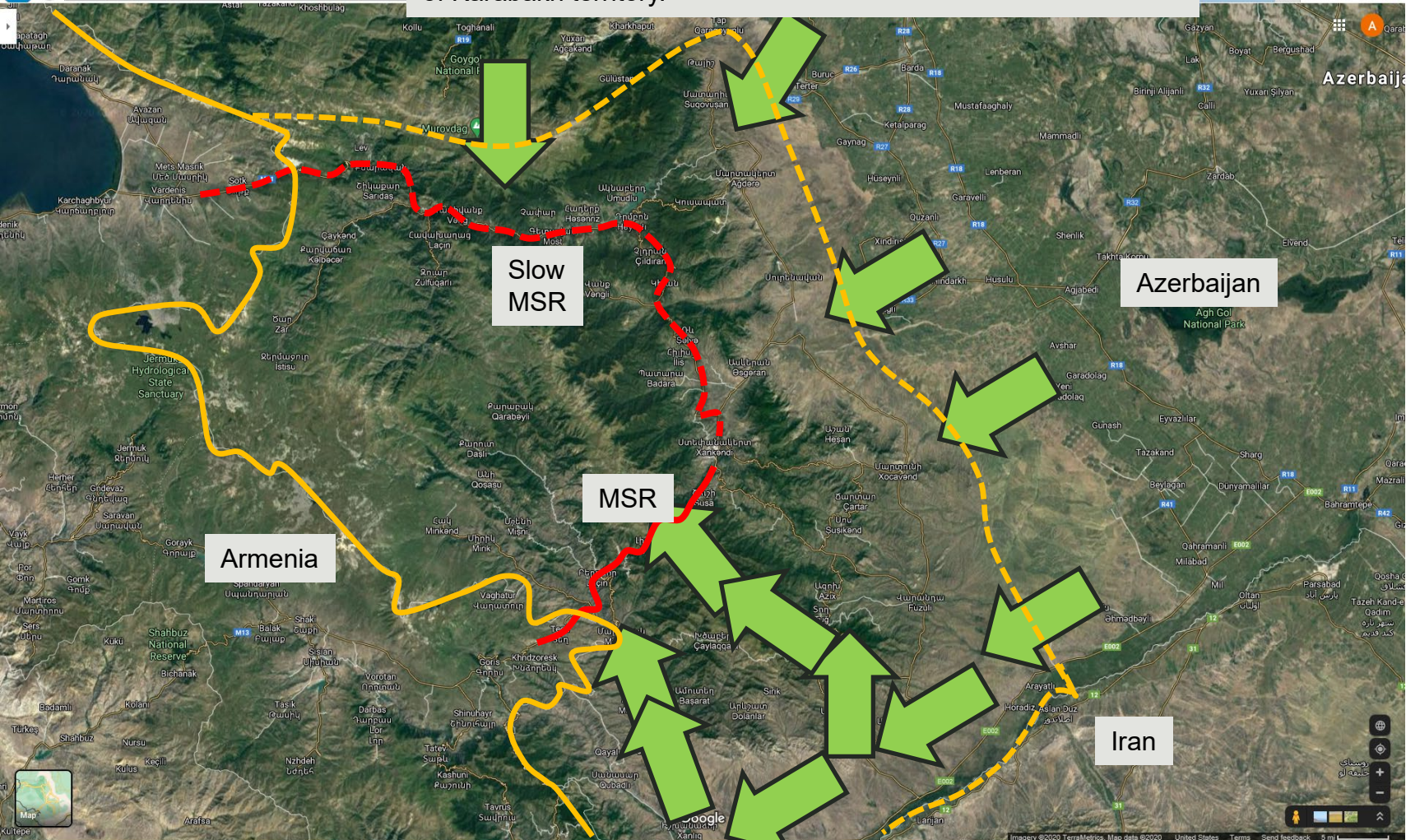
Slow MSR

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Approximate timeline:
Oct24-Nov08 – AZE teams of SOF infiltrate North-West from Hadrut thru mountains towards Shusha; take it on Nov08 and sever the MSR. Nov09 – ARM agrees to truce, surrenders most of Karabakh territory.

Slow MSR

MSR

Armenia

Azerbaijan

Iran

THE MAJORITY OF ARMENIAN LOSSES WERE TO UNMANNED SYSTEMS

- **Tanks (T-72A, T-72B, etc) ~ 170**
- **AVF, IFVs (MT-LB, BMP-2, etc) ~ 55**
- **Towed artillery (122 mm D-30, 152 mm D-20, etc.) ~ 110**
- **SPGs (122 mm Gvozdika, 152 mm Akatsiya) ~ 16**
- **SAMS and radars (Osa, Strela-10, Krug, Kub, S-300) ~ 30-40**
- **Transportation vehicles (KamAZ, Zil-131, Ural-4320, etc.) ~250**
- **Other systems ~ 50**
- **Major command posts ~ 6**
- **Major ammo dumps ~ 4**
- **Personnel – "very heavy losses to drones" per Armenian CG in Karabakh**

Based on, or estimated from, open sources. Accuracy is uncertain.

Graphics from https://www.oryxspioenkop.com/2020/09/the-fight-for-nagorno-karabakh.html?m=1

AZERBAIJAN UNMANNED SYSTEMS

- (80% of targets) Bayraktar TB2 w/ MAM-L laser-guided bombs; payload 150 kg, incl. 55 kg bombs; 220 km/h max, 150 km comms range, 27 hrs endurance, 5.5 km oper. alt.

- (10-20%) Harop loitering munition, 23 kg warhead, 400 km/h max, 200 km comms range, 9 hrs endurance, 4.6 km oper. alt.

- (5-10%) Spike-NLOS missile, 70 kg total, 25 km range

- Orbiter-1K, 2 kg warhead, EO/IR, 2 hrs endurance

- Orbiter 3 (EO and laser pointer), 150 km range, 7 hrs endurance

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WHAT MIGHT KARABAKH 2020 TELL US ABOUT THE FUTURE?

Note: also see Kott, A., "Ground Warfare of 2050: How it might look," ARL, 2018, on DTIC or
https://www.hsdl.org/?abstract&did=815560

- **The dawn of "intelligent munitions": rounds, missiles, loitering munitions, etc.**
  - Most will acquire sensors, on-board intelligence, means of maneuvering, etc.
  - Growing autonomy
  - Smaller sizes
  - Wolf packs with complex tactics
- **Emergence of ground-hugging, NOE, between-the-trees intelligent munitions**
- **Emergence of fly—perch—fly intelligent munitions**
- **1000's of semi-autonomous entities in hyperactive battle → near-autonomous C2**

WHAT MIGHT KARABAKH 2020 TELL US ABOUT THE FUTURE? (CONT.)

- Short-range point defense: APS, C-RAM, etc.
- Intelligent, believable decoys against intelligent munitions
- Subterranean tunnels, novel types of fortifications
- Dismounts in small distributed teams in high cover and concealment areas
- Highly distributed C2, short—hop self organizing networks

EXAMPLES OF WATERSHED HISTORIC EVENTS IN MILITARY TECHNOLOGY

Examples of events where a military technology (not necessarily new) proved decisive (not merely useful), and then became widely accepted and acquired:

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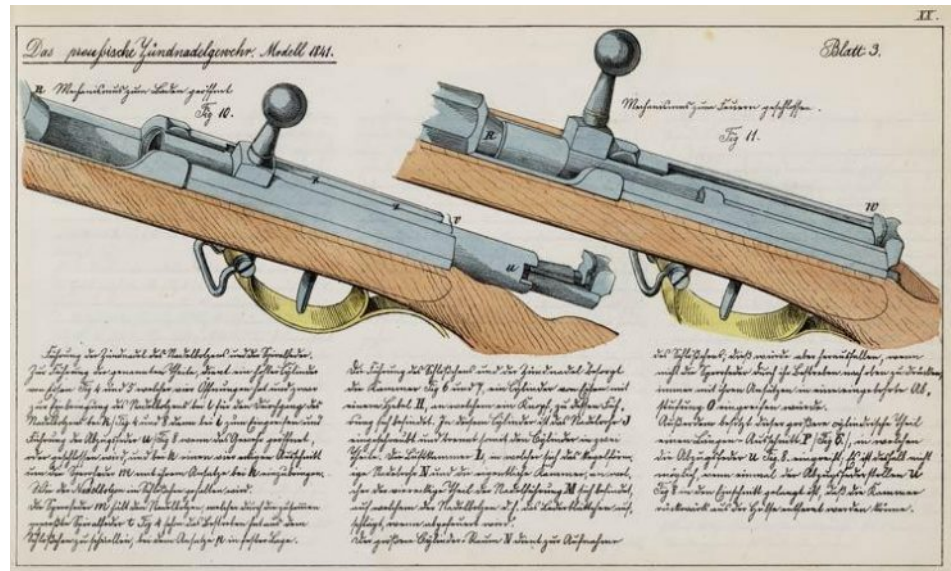
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- **Unmanned munitions:**
  Karabakh War, 2020