



Lesson 3.5c

Combining Physical Terrain (PT) Factors



Lesson 3.5c Content

- Military Aspects of the Terrain
 - Map Overlays
- Military Aspects of the Weather
 - Weather Effects Matrix



Learning Outcomes

- Conduct an analysis of Physical Terrain, by identifying the military aspects of the terrain
- Classify terrain areas according to the mobility afforded, i.e. “unrestricted”, “restricted”, “severely restricted”
- Produce a Combined Obstacle Overlay and an Avenue of Approach Overlay
- Assess the impact of climate / weather on PT as exemplified by a Weather Effects Matrix

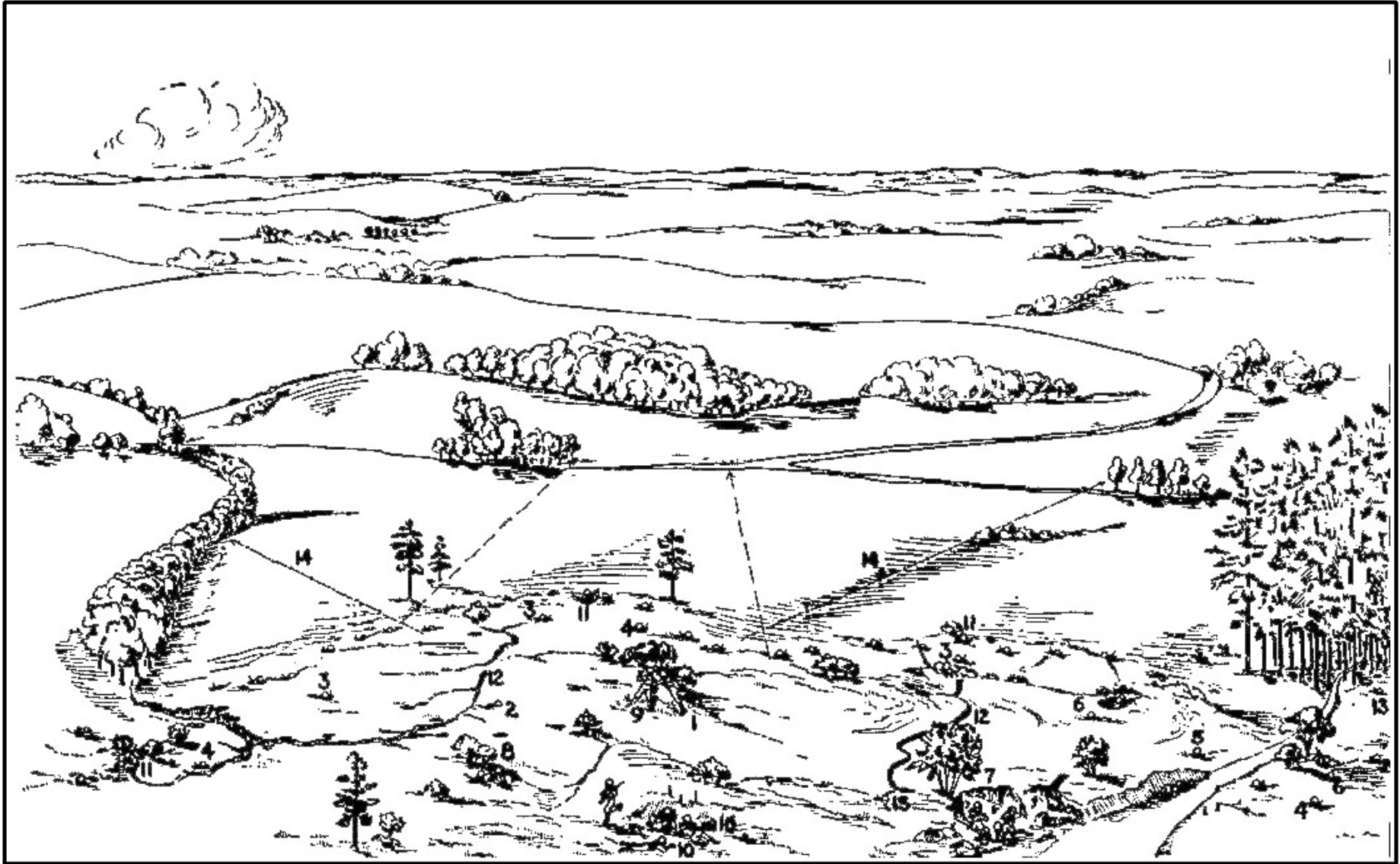


Military aspects of the terrain

- Why do we need to determine the Military Aspects of the terrain?
 - To determine its effects on Military Operations
- What are the Military Aspects of the Terrain?
 - Observation & Fields of Fire
 - Cover & Concealment
 - Obstacles
 - Key Terrain
 - Vital Terrain
 - Avenues of Approach
- Consider all of these factors when analysing terrain, but always focus on the ones of most relevance to the specific situation at hand.



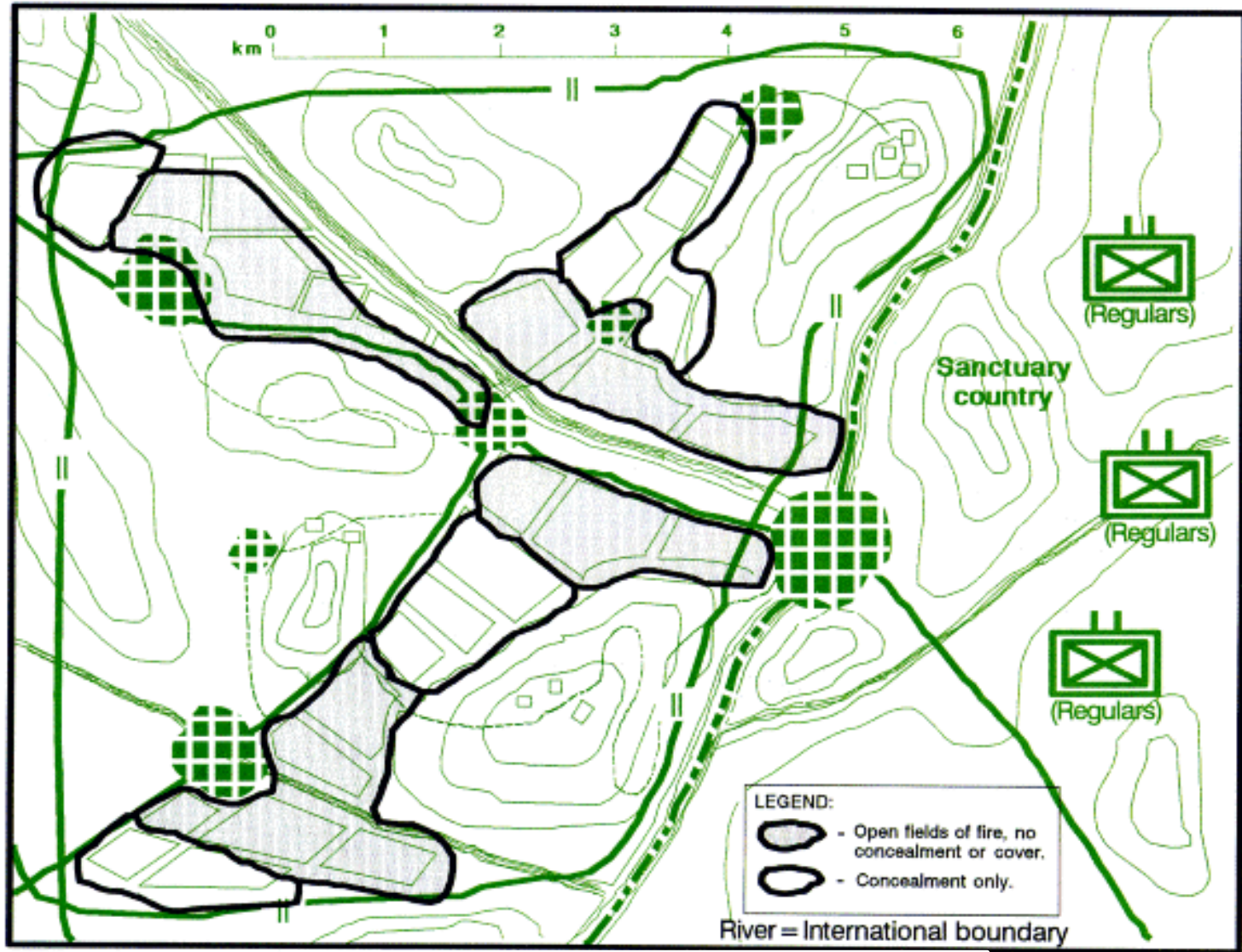
Observation & Fields of Fire



- Observation applies to what can be seen / needed to gain information about actors
- Fields of Fire applies to what can be hit



Cover and Concealment Overlay



- Cover is the protection from direct and indirect fires
- Concealment is protection from observation



Obstacles

Obstacles: natural or man-made obstruction to disrupt, fix, turn, canalize or block movement





Terrain Mobility Classifications





Key terrain

Key terrain gives an advantage to forces or opposing groups



Key Terrain: 



Vital ground

- Ground of importance
- Retained or controlled for mission success

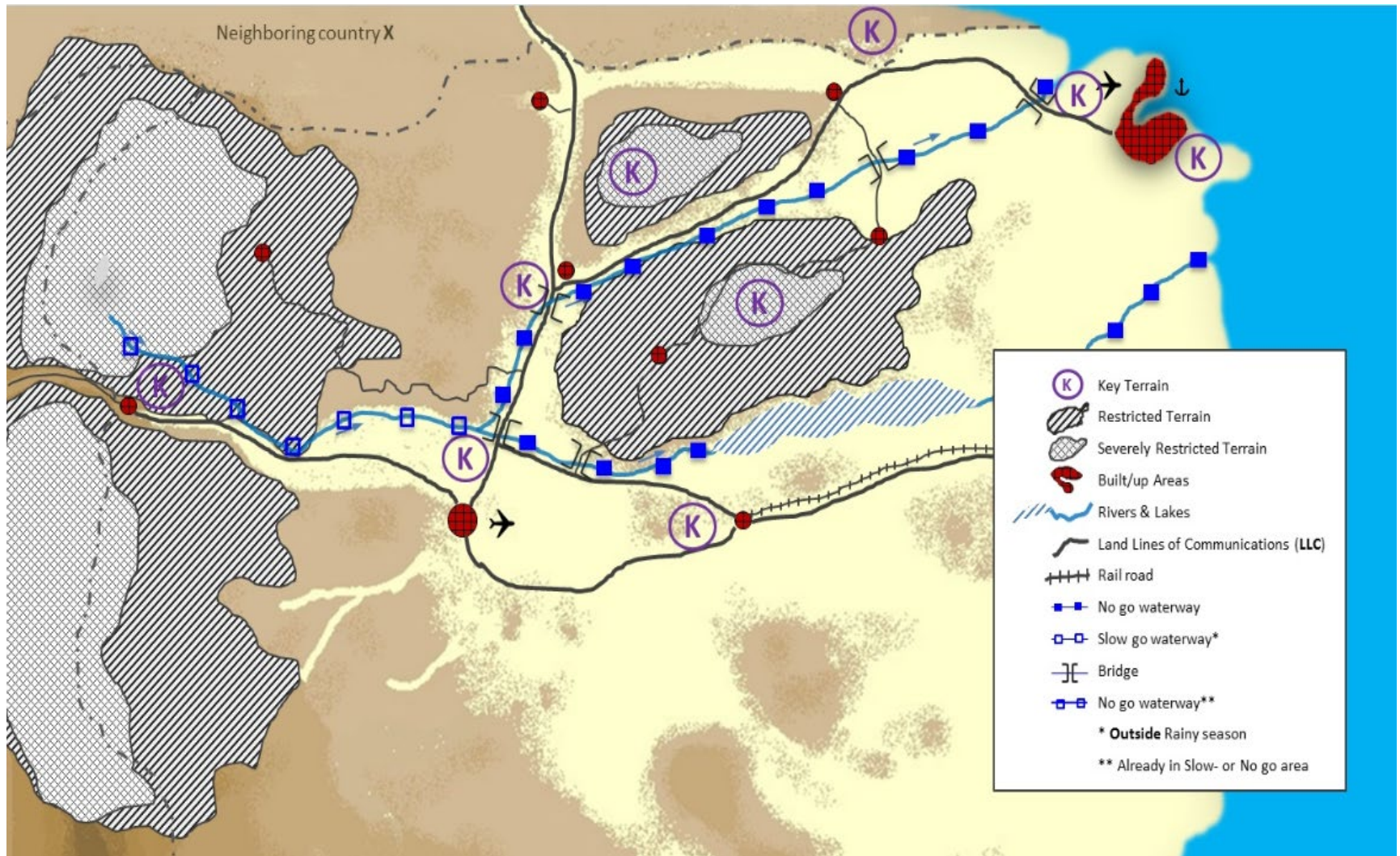


Vital ground:





Combined Obstacle Overlay



- The COO integrates the evaluations of the various factors into a single product that depicts the effects of the environment on mobility



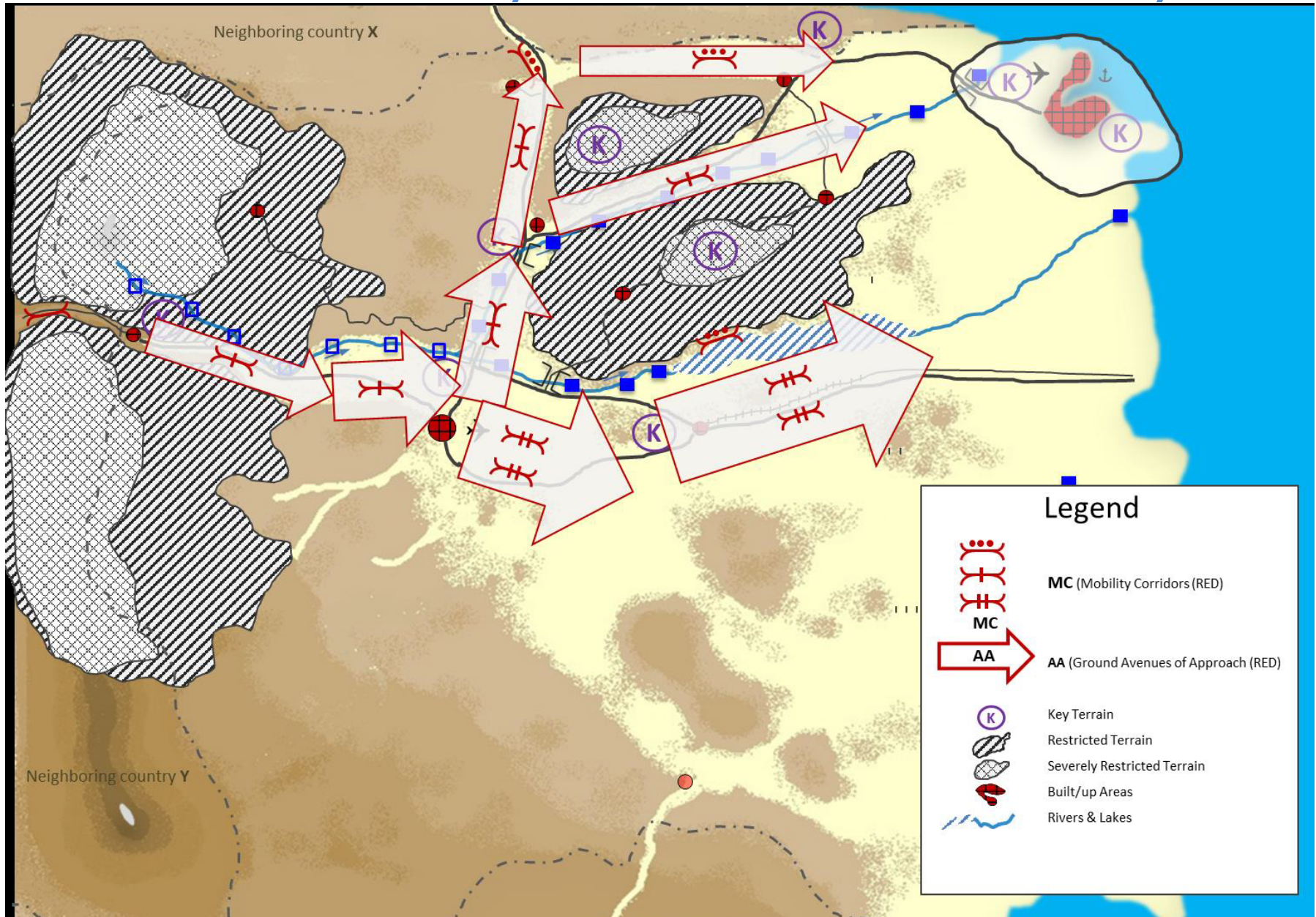
Learning Activity

- **Situation:**
 - Using the course scenario create a combined obstacle overlay in your AIR.
- **Task:**
 - Study the map and completed overlays and create:
 - Obstacle overlay
 - Key Terrain and Vital Ground overlay
 - Insert factors into the 3-column format (3CF) and make deductions
 - Draw up a list of Information Requirements
- **Time:** 30 minutes (group work and discussion)

FACTOR	DEDUCTION	OUTPUT
Border crossing at Point X is Key Terrain	Threat Actor A needs to be able to pass through BXP to reach consolidation area. UN needs to control/surveil BXP. Local population Traders will need BXP open to meet market expectations.	RFI. Who controls BXP X?



Mobility Corridor Overlay





Learning Activity

- **Situation:**
 - You are still analyzing the terrain and are about to finalize and disseminate the products.
- **Task:**
 - Study the map and create the AAO and the MCOO
 - Insert factors into the 3-column format (3CF) and make deductions
 - Draw up a list of Information Requirements
- **Time:** 30 minutes (group work and discussion)

FACTOR	DEDUCTION	OUTPUT
Good LLOC moving from east to west, surrounded by plains.	Threat Actor A requires cover and concealment to move and may choose a different AoA. Threat actor B needs to space to move armour and so will likely choose this AoA.	IR. What terrain areas will confirm or deny threat actor COA?



Remember

You are not alone:

- Terrain Analysis a total UN staff effort

Get support:

- Engineer staff (G-3)
- GIS cells (both military and civilian)

Use mnemonics:

- OCOKA- **O**bservation & fields of fire, **C**over and concealment, **O**bstacles (manmade / natural), **K**ey terrain, **A**venues of approach

Why and for whom?

- To understand the terrain and its effects on our operations
- For the staff, not just for the intelligence branch





Weather and Climate

Date:	Sat 17 Aug 2019	Sun 18 Aug 2019	Mon 19 Aug 2019	Tue 20 Aug 2019	Wed 21 Aug 2019
Weather type					
Max Temp °C / °F	44°C / 111°F	40°C / 104°F	36°C / 97°F	33°C / 91°F	32°C / 90°F
Min Temp °C / °F	27°C / 81°F	24°C / 75°F	20°C / 68°F	17°C / 63°F	17°C / 63°F
Clouds	Clear	Scattered	Broken	Overcast - Rain	Overcast - Rain
Precipitation	0 - 15 mm	0 - 15 mm	0 - 15 mm	225 - 290 mm	250 - 300 mm
Humidity	25 %	25 %	60 %	75 %	75 %
Wind direction	SW	SW	SE	E	E



AOE

Analysis of the Operating Environment

Human factor orientated

Threat and opportunities are integrated



Phase 1

OEE

Operating Environment
Evaluation

Phase 2

AE

Actor Evaluation

a. Physical terrain

b. Human terrain

c. Information terrain

*Inter-relation, interaction and
'flow'*

Emphasis on influencing
/ **threatening actors**
(Threat Evaluation - **TE**)
and opportunities

Phase 3

SI

Situation Integration

Emphasis on interaction (systems) on the
ground between factor developments and actor
behavior presented in integrated predictive
scenario's and ACOA's



Difference Weather and Climate

Weather:

- Short-term state of the atmosphere
- Can vary from time to time or location to location
- Always includes time and location

Climate:

- Long-term pattern of weather
- Long-term = 30 years or more
- Average weather over many years in one specific place














Weather Effects on Operations

- Visibility
- Wind
- Precipitation
- Cloud cover / ceiling
- Temperature
- Humidity





Weather forecast and Effects Matrix

Date:	Mon 25 Nov 2018	Tue 26 Nov 2018	Wed 27 Nov 2018	Thu 28 Nov 2018	Fri 29 Nov 2018
Weather type					
Max Temp °C / °F	27°C / 81°F	24°C / 75°F	23°C / 74°F	23°C / 74°F	23°C / 74°F
Min Temp °C / °F	17°C / 63°F	16°C / 61°F	12°C / 54°F	11°C / 52°F	11°C / 52°F
Clouds	Clear	Scattered	Broken	Overcast - Rain	Overcast - Rain
Precipitation	0 – 15 mm	0 – 15 mm	0 – 15 mm	225 – 290 mm	250 – 300 mm
Humidity	25 %	25 %	60 %	75 %	75 %
Wind direction	SW 	SW 	SE 	E 	E 
Sunrise and set	06.07 / 18.58 hour LT	06.08 / 18.59 hour LT	06.09 / 19.00 hour LT	06.10 / 19.01 hour LT	06.11 / 19.02 hour LT
Moonrise and set	20.26 / 07.47 hour LT	21.04 / 08.33 hour LT	21.37 / 09.19 hour LT	22.17 / 10.04 hour LT	22.57 / 10.51 hour LT
Illumination % night	Illumination 88.5 %	Illumination 81.6 %	Illumination 73.4 %	Illumination 64.1 %	Illumination 53.9 %
Weather effects matrix					
Date:	Mon 25 Nov 2018	Tue 26 Nov 2018	Wed 27 Nov 2018	Thu 28 Nov 2018	Fri 29 Nov 2018
UN Personnel				Heavy rain	Heavy rain
UN Materiel				Heavy rain	Heavy rain
Rotary Wing and VSTOL				Visibility	visibility
Fixed wing - transport				Visibility and wind	visibility
UAV				Visibility & wind	Visibility & rain
Movements (roads)				Flooding risk	Flooding risk
Movements (off-road)					Condition & Flooding
Communications				Distance reduction	Distance reduction
Specific effects on UN Operating Environment		NSTR	NSTR	DPRE / Flooding	DPRE / Flooding risk NCAG / TERR IED
Legend:	Non-assessable / NSTR	Favorable	Marginal	Unfavorable	



Learning Activity

Situation: Using the weather forecast on the matrix supplied to you, decide what affects this will have on Sector ISR assets

Time: 30 minutes (group work and discussion)

FACTOR	DEDUCTION	OUTPUT
Fog due on 07 Dec 2019	Threat Actor A likely to attempt to move to exploit lack of UN ISR resources.	Action. UN to deploy OP on NAI 1.



Take Away

- PT analysis is crucial to OEE as it is the basis for analysis of the Human and Information Terrains
- Terrain analysis overlays are based on accurate mapping and is essential to MPKI and MDMP
- Climate and weather affect PT
- COAs for the UN and mandate spoilers are determined by PT



Questions?