

Federal GIS Conference 2014

February 10–11, 2014 | Washington DC

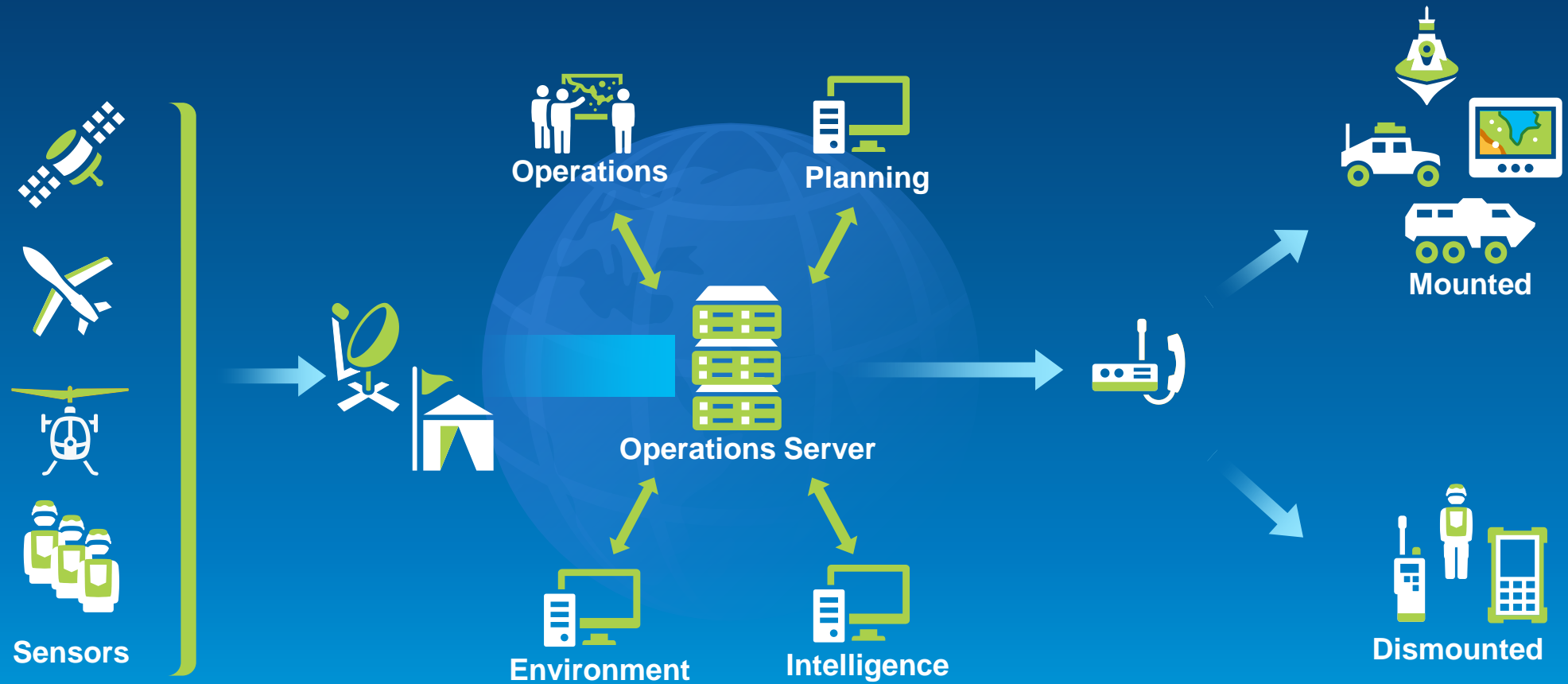


ArcGIS for the Military: Analyzing the Operational Environment

Matt Funk

Esri (Redlands)

ArcGIS for the Military



An operations server



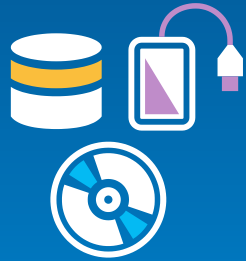
An operations server



An operations server



Feeds



External
Content



Operational Content



Operational Environment



Staff Products



Terrain
Workstation



Imagery
Workstation

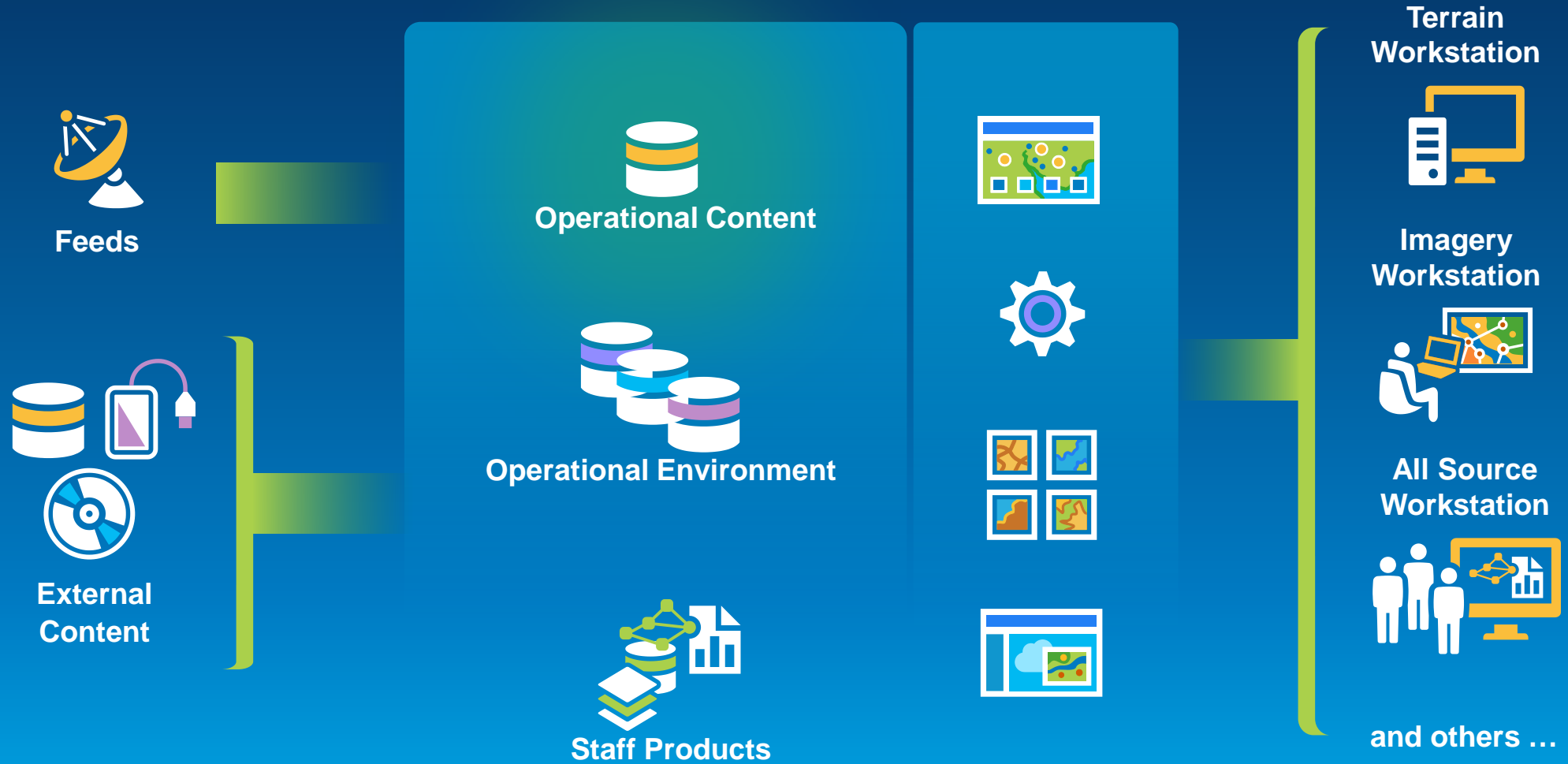


All Source
Workstation



and others ...

An operations server



An operations server



A operations server



Analyzing the Operational Environment



Analyzing the Operational Environment

Operational Environment

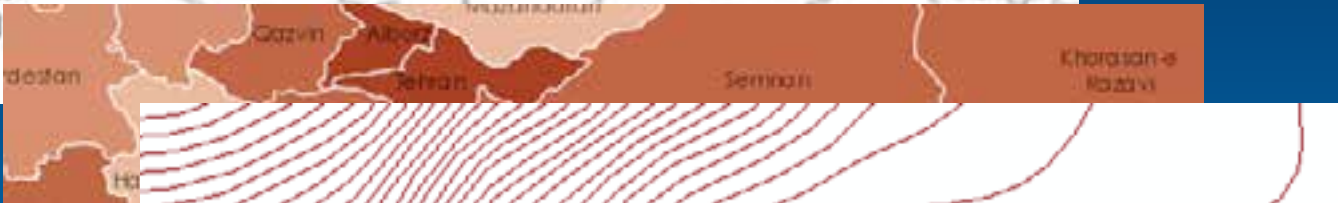
Operational
Factors

Terrain Analysis

Weather Analysis

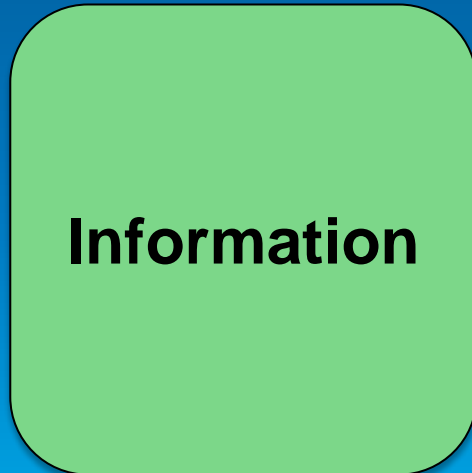
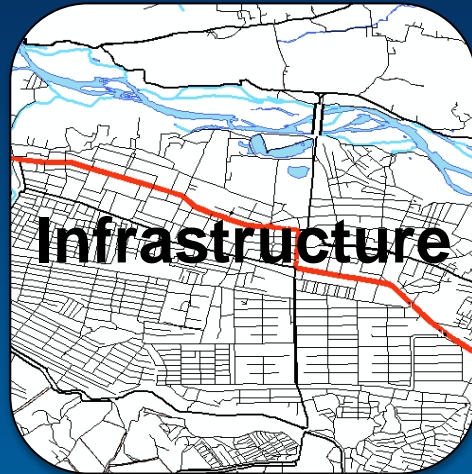
Operational Factors





Score	Match_addr
100	Jalalabad, AFGHANISTAN, AF
100	Jalalabad, AFGHANISTAN, AF
100	Jalalabad, AFGHANISTAN, AF







National Provincial District Settlements



Installations Areas Commands

Economic

Agriculture

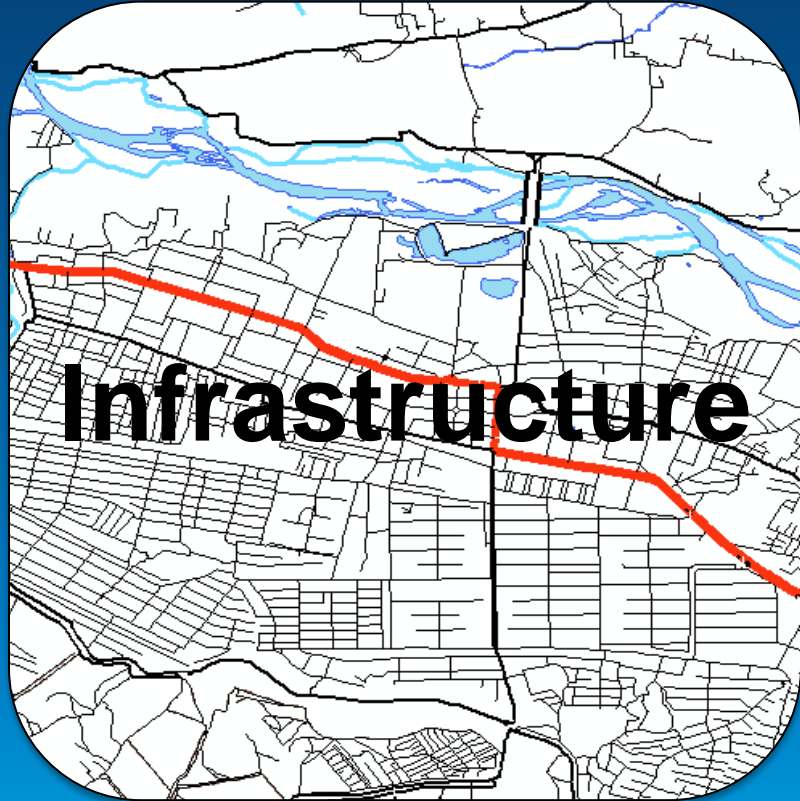
Commerce

Industry

Trade



Population
Literacy
Religion
Language



Transport
Buildings
Obstacles
TFDM

Information

Comm Infrastructure

Radio/TV

WiFi/Mobile



Elevation
Bathymetry
Hydrology
Vegetation



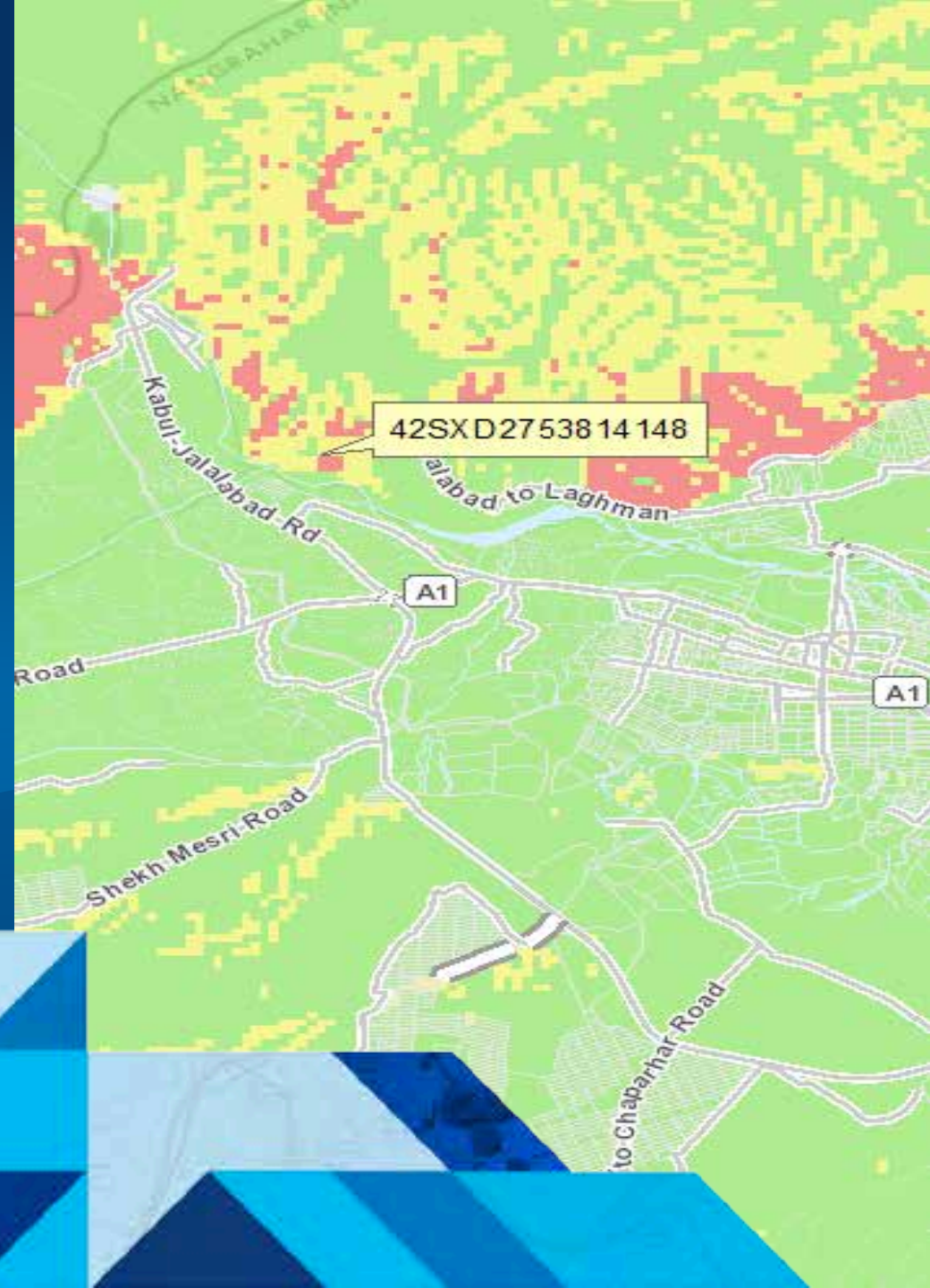
**Aerial/Satellite
Panchromatic
Multispectral
Scanned Maps**

Demo

Operational Factors

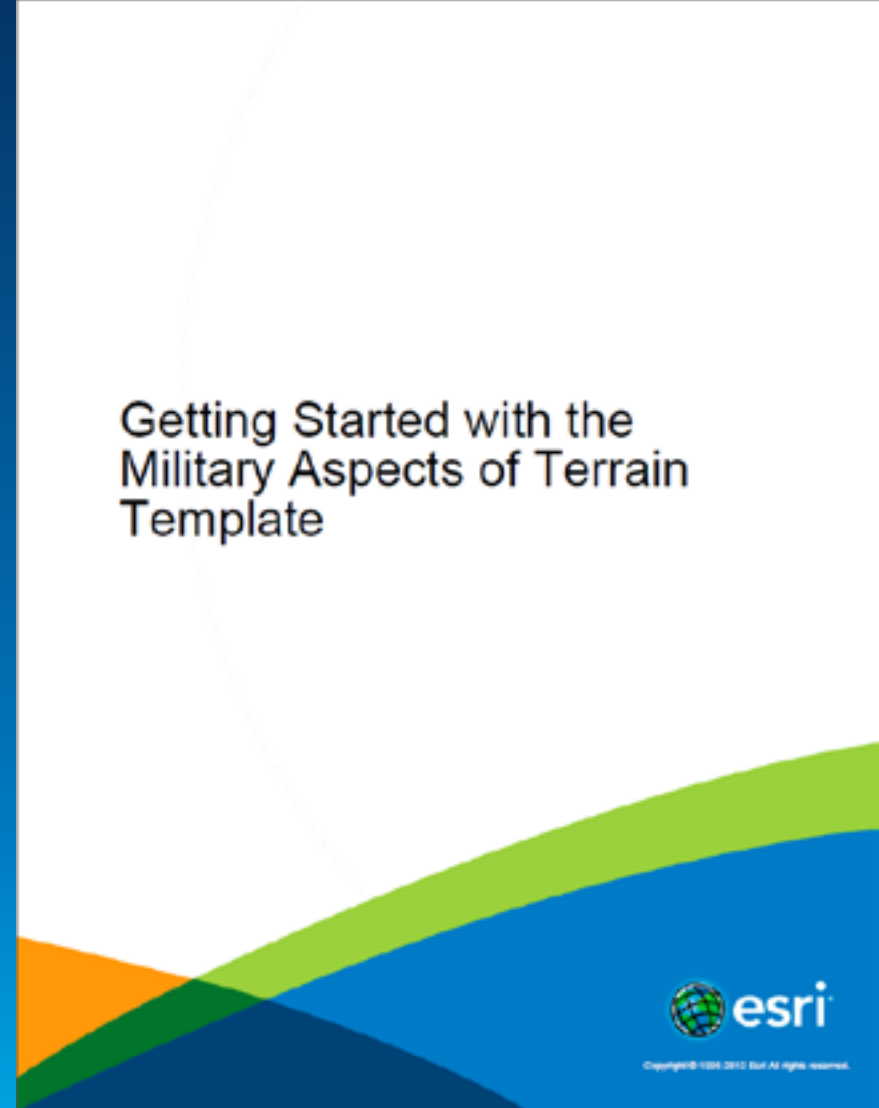


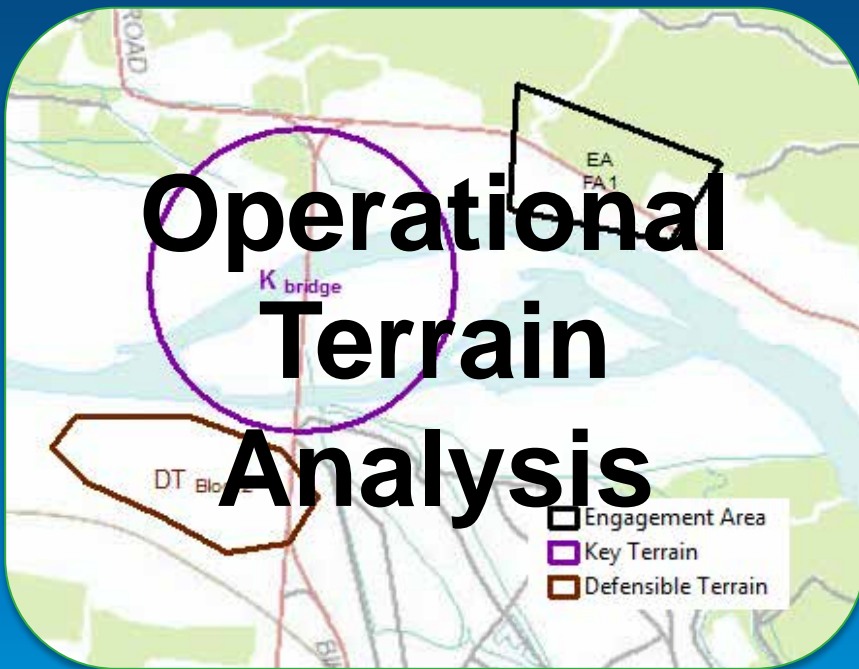
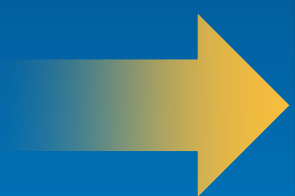
Terrain Analysis



Military Aspects of Terrain

- ArcGIS Desktop template
- Terrain Suitability
- Support planning for operations



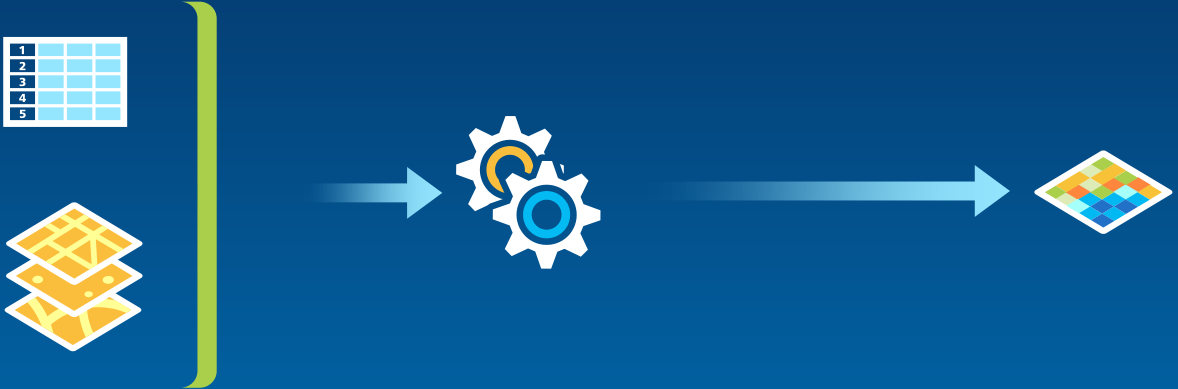




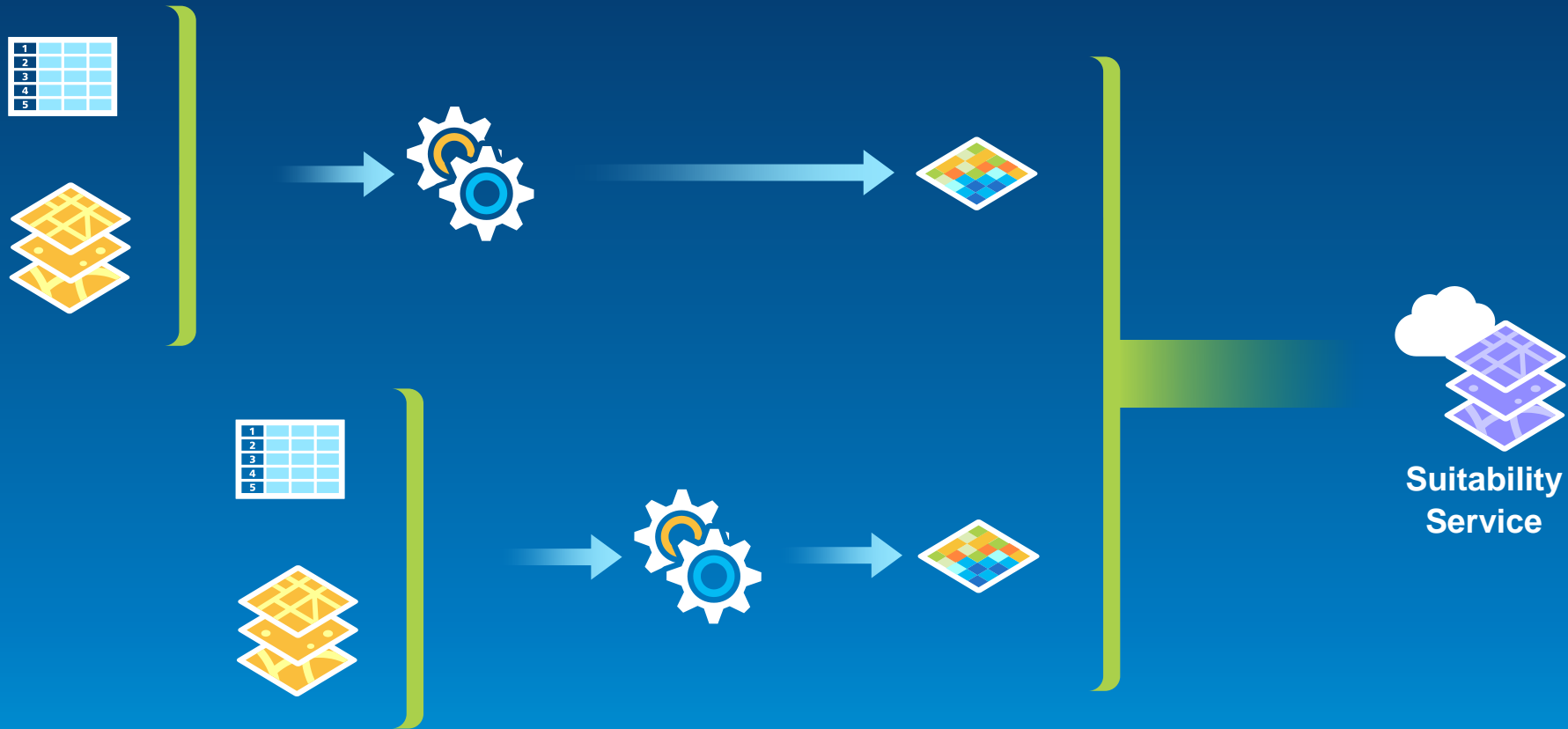
General small-scale suitability

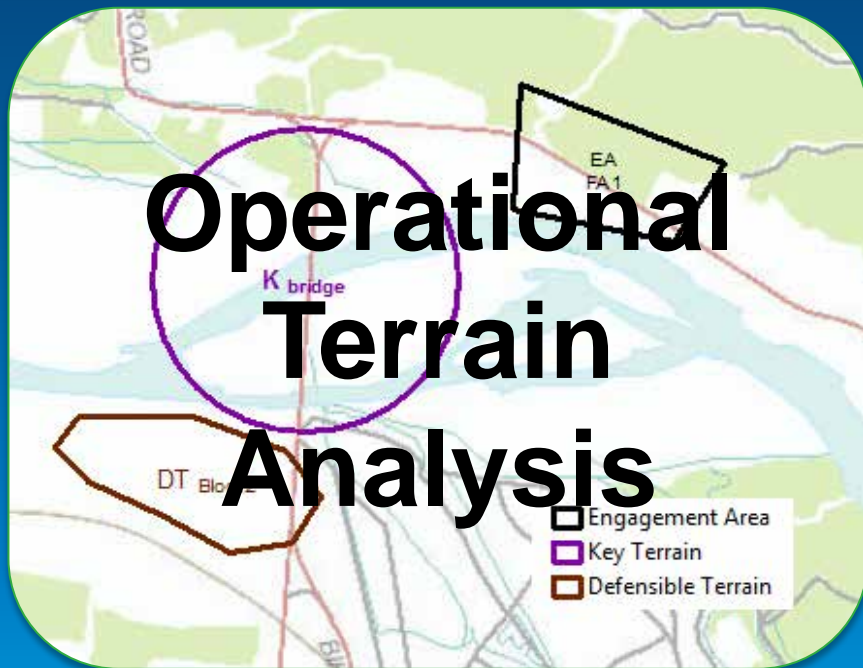
- Cover and Concealment
- Suitable Drop Zones
- Suitable Helicopter Landing Zones
- Cross country mobility

Build suitability overlays ...



Build suitability overlays ... and share

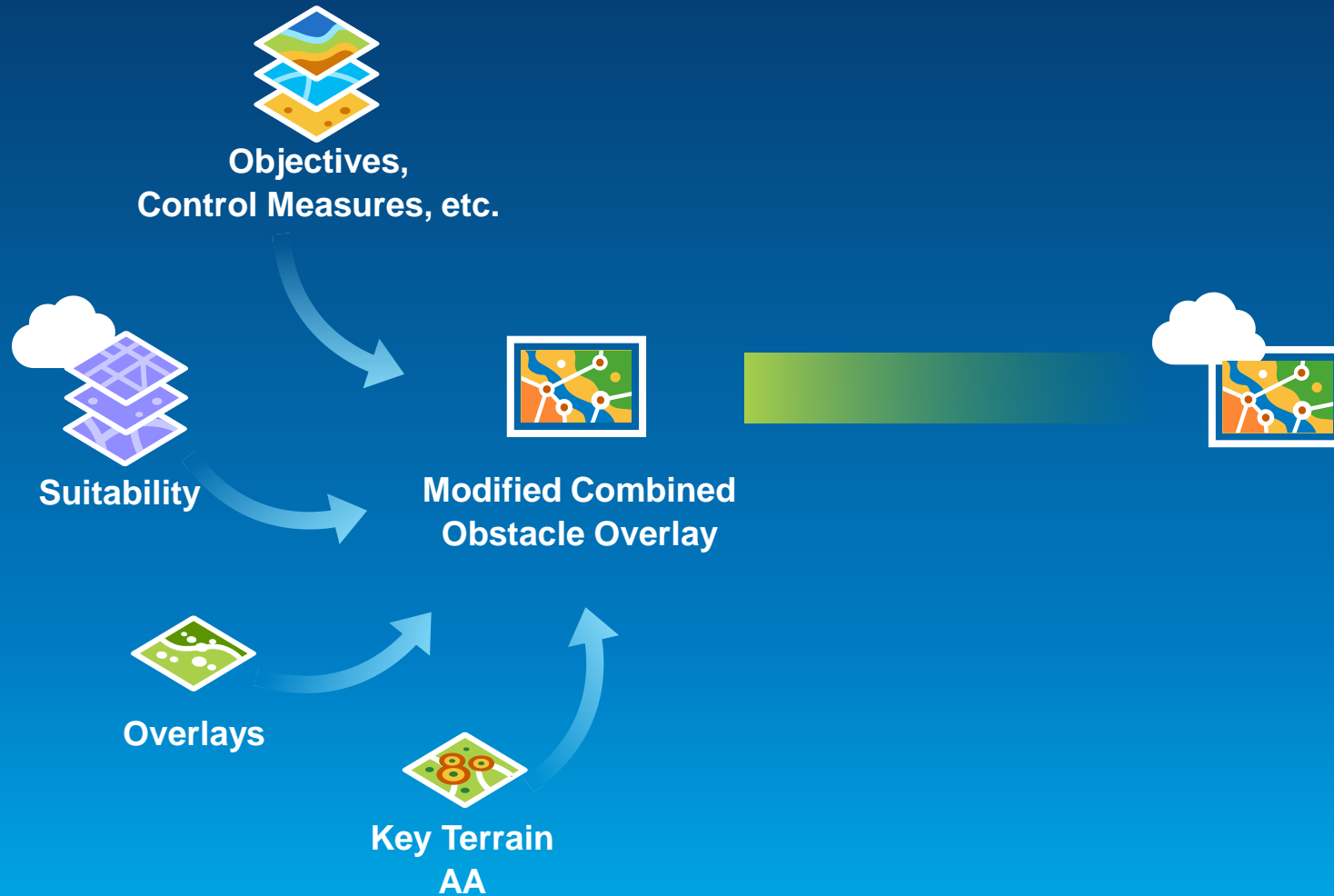




Terrain Analysis for mission planning (Modified Combined Obstacle Overlay)

- Obstacles and Lines of Communication
- Suitability
- Key Terrain
- Zones of Entry

Operational Terrain Analysis



Demo

Military Aspects of Terrain

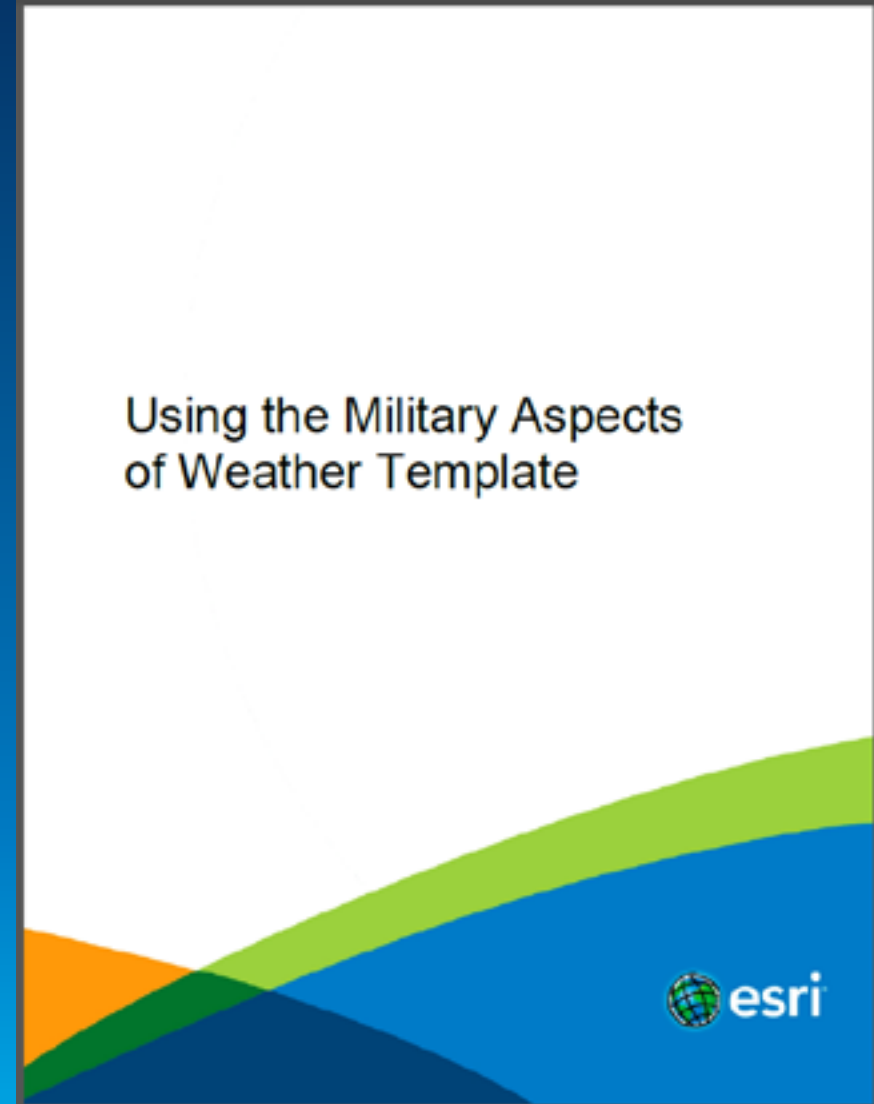


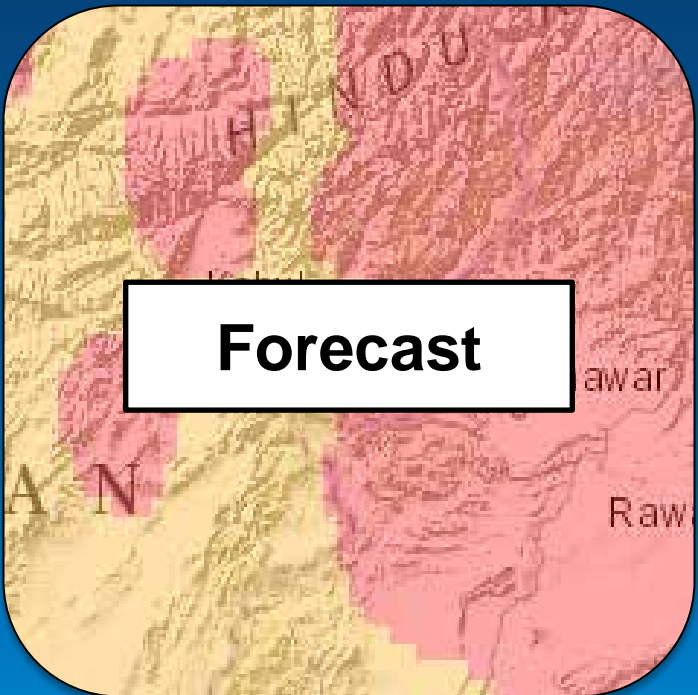
Weather Analysis

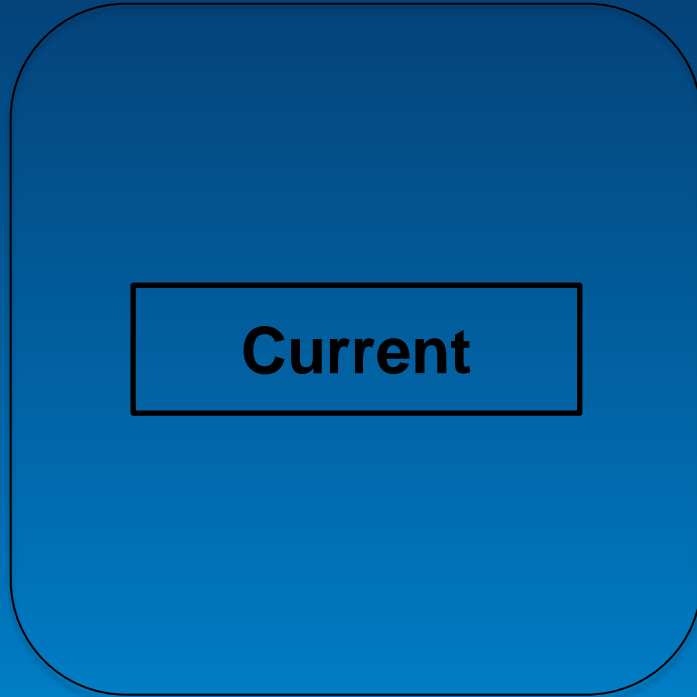


Military Aspects of Weather

- Uses standard weather and climate data
- Describe weather and climate conditions
- Calculate weather impact on operations





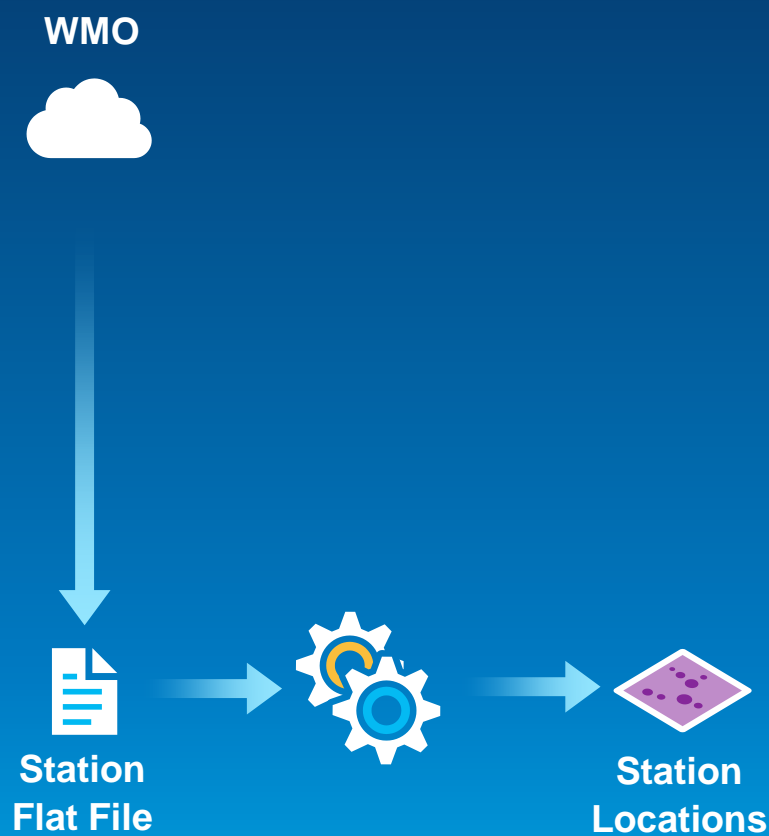




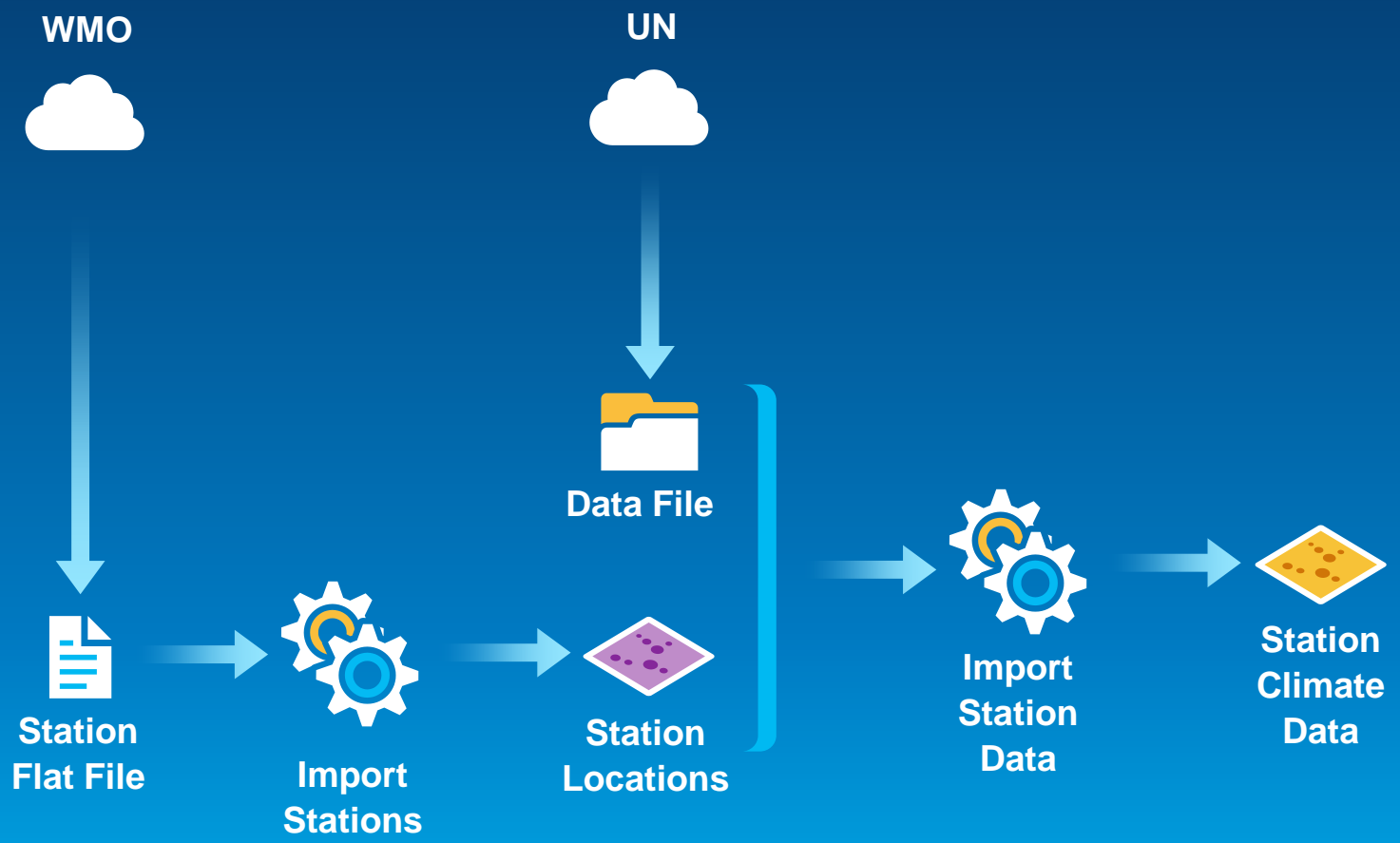
World Meteorological Organization (WMO) Station Data

- Climate variables at weather stations

Import WMO Stations



Import WMO Station Data





Climate

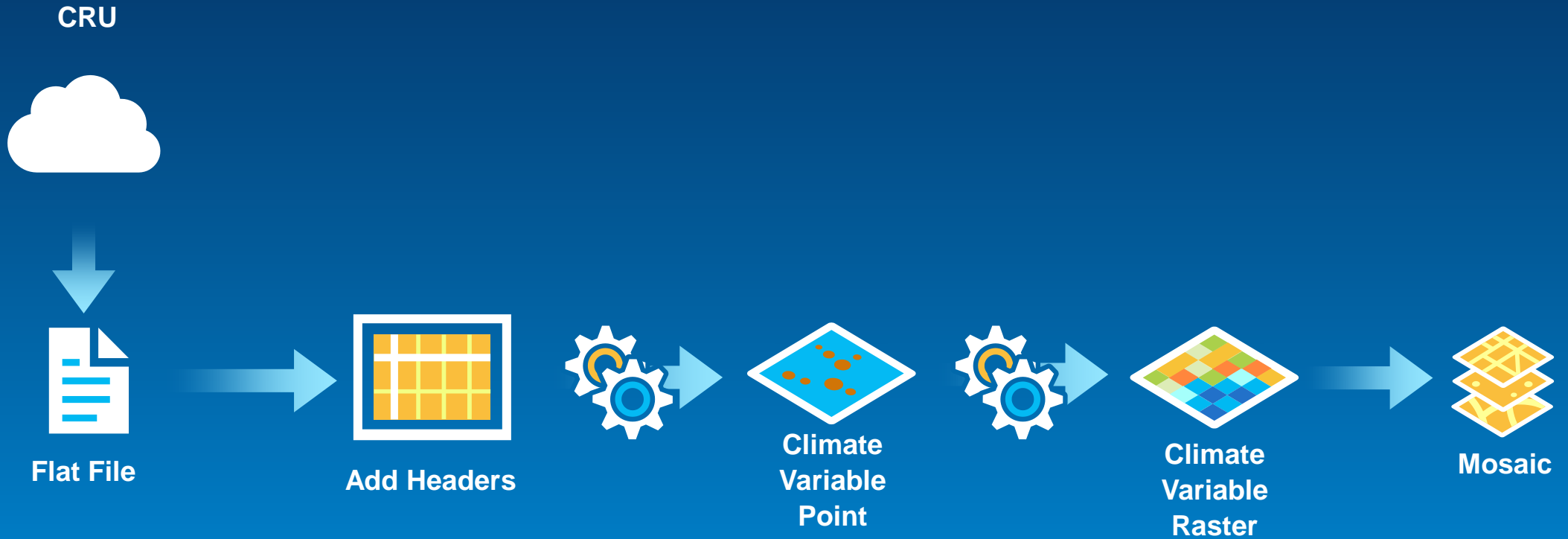
World Meteorological Organization (WMO) Station Data

- **Climate variables at weather stations**

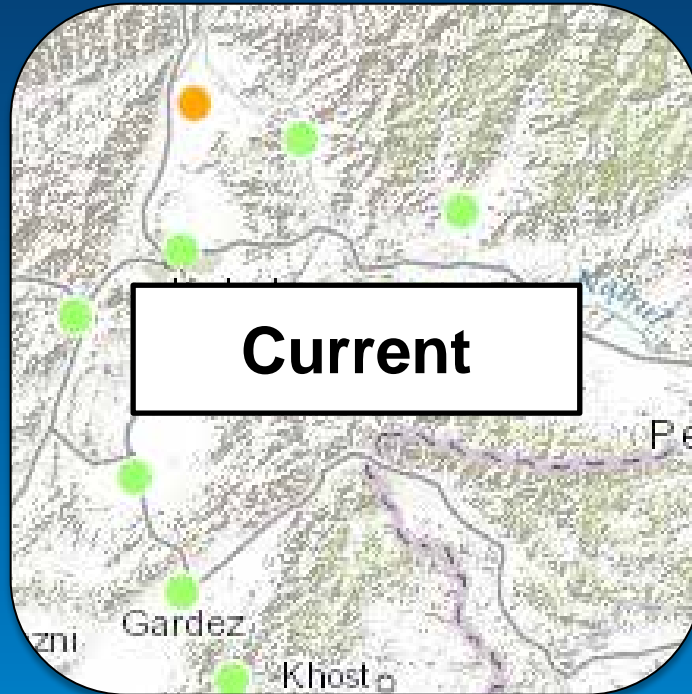
Climate Research Unit, University of East Anglia, UK

- **Climate variables at 10-minute grids**

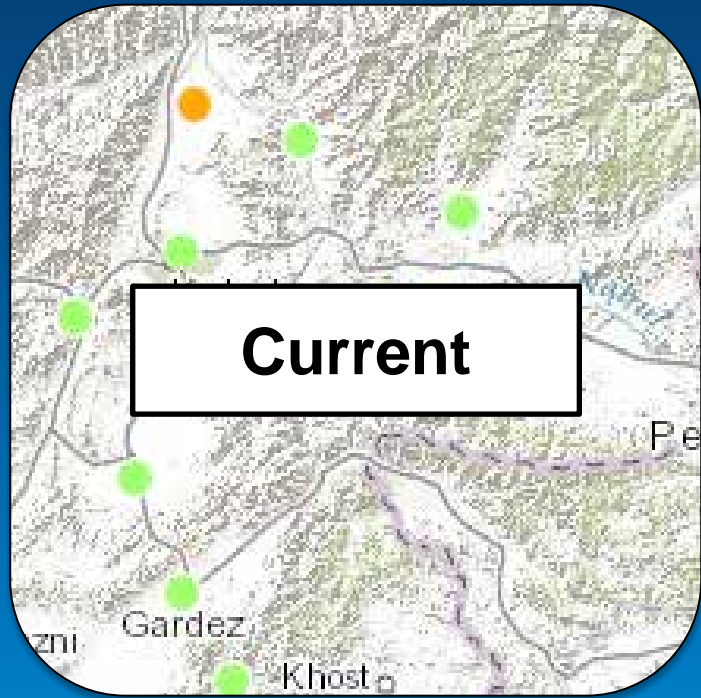
Climate Research Unit climate data



Climate



Forecast



NOAA Meteorological Aerodrome Reports (METAR)

Imported weather variables at location

Impacts processed

Importing Current Conditions

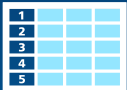


METAR



Weather
Variables

Importing Current Conditions



1				
2				
3				
4				
5				

Operational
Thresholds



METAR



Weather
Variables

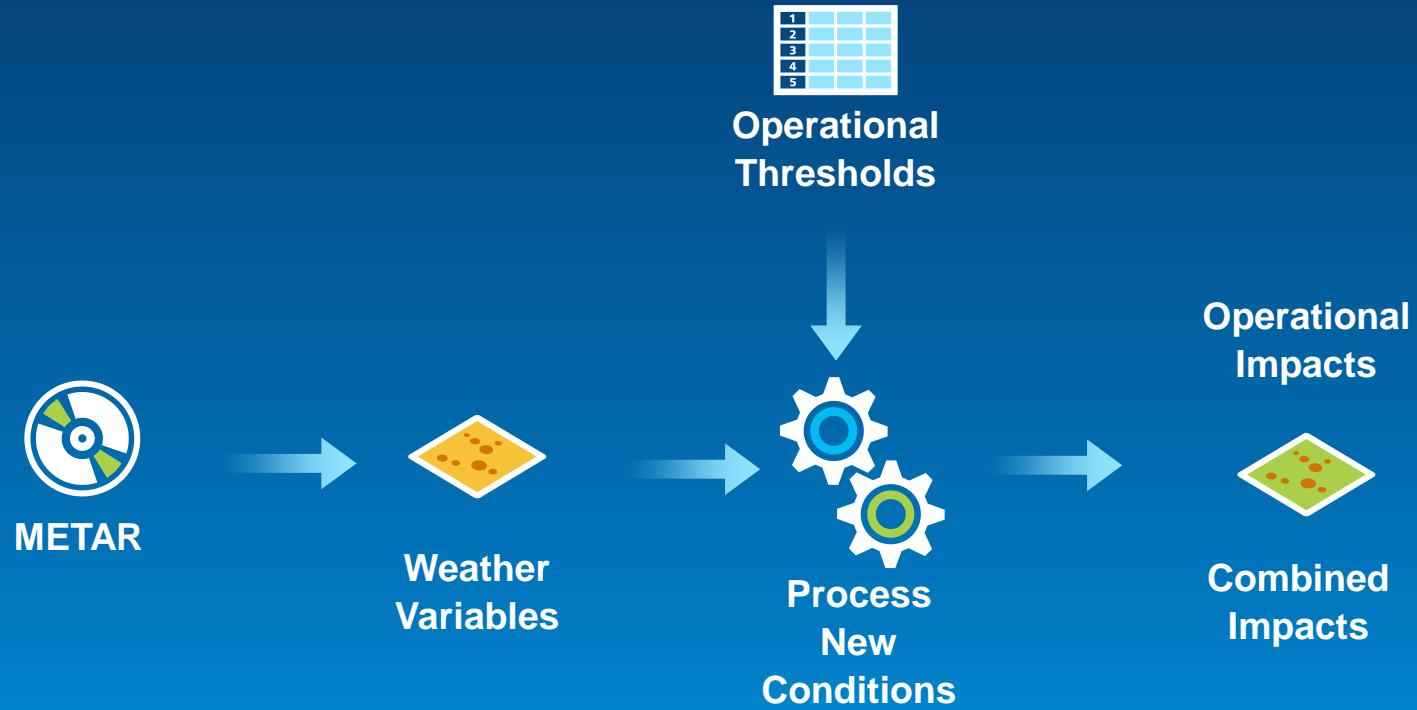
Operational Thresholds table

OBJECTID *	OperationalActivity	WeatherVariable	ThresholdFromValue	ThresholdToValue	ThresholdUnits	OperationalImpact
58	Unmanned Aerial Vehicle	Cloud Ceiling (ft above ground)	0	3932.72	ft	-2
59	Unmanned Aerial Vehicle	Cloud Ceiling (ft above ground)	3936	5904	ft	-1
60	Unmanned Aerial Vehicle	Cloud Ceiling (ft above ground)	5907.28	65600	ft	0
61	Unmanned Aerial Vehicle	Visibility (km)	0	4.99	km	-2
62	Unmanned Aerial Vehicle	Visibility (km)	5	8	km	-1
63	Unmanned Aerial Vehicle	Visibility (km)	8.1	200	km	0
64	Unmanned Aerial Vehicle	Wind Speed (km/hr)	27	380	km/hr	-2
65	Unmanned Aerial Vehicle	Wind Speed (km/hr)	0	26.964	km/hr	0

Operational Impact:

- **0 = No Effect**
- **-1 = Moderate Restrictions**
- **-2 = Severe Restrictions**

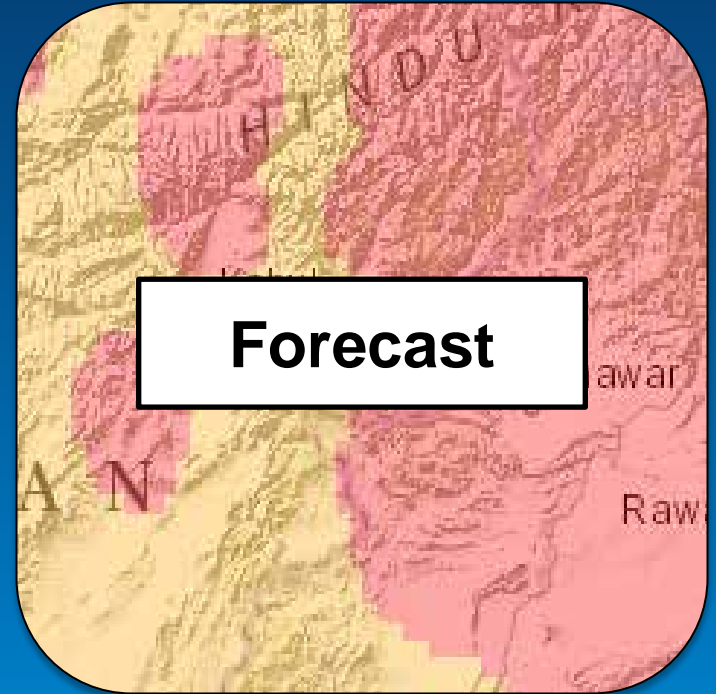
Processing Current Conditions

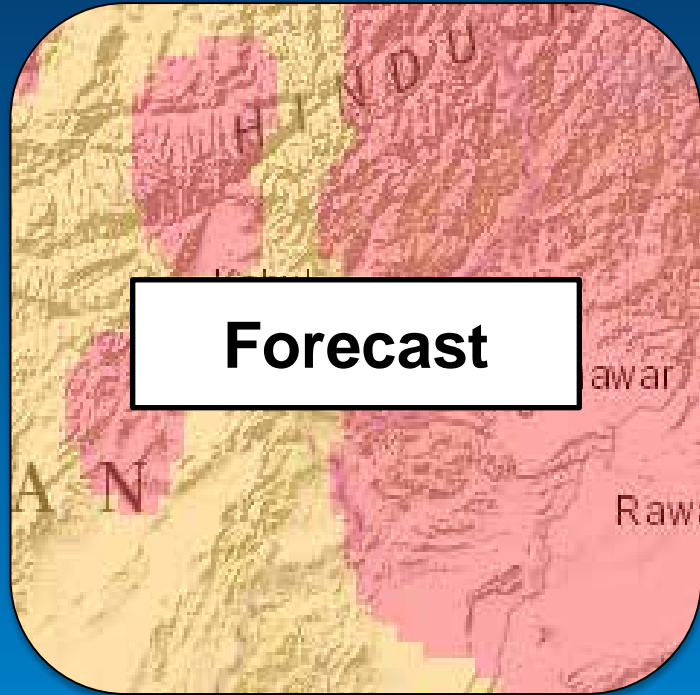


Climate

Current

Forecast





OGC Climate and Forecast (CF) NetCDF Convention

WMO GRIB data

Forecast weather variables and impacts

Importing forecast variables

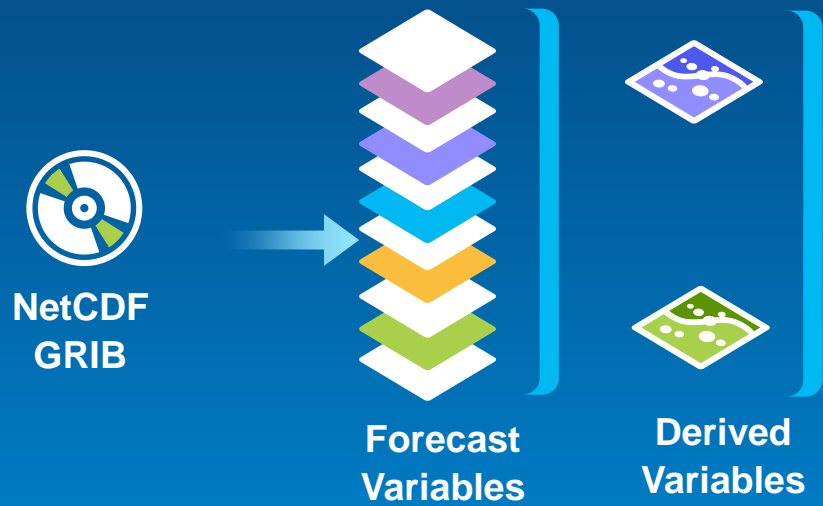


NetCDF
GRIB

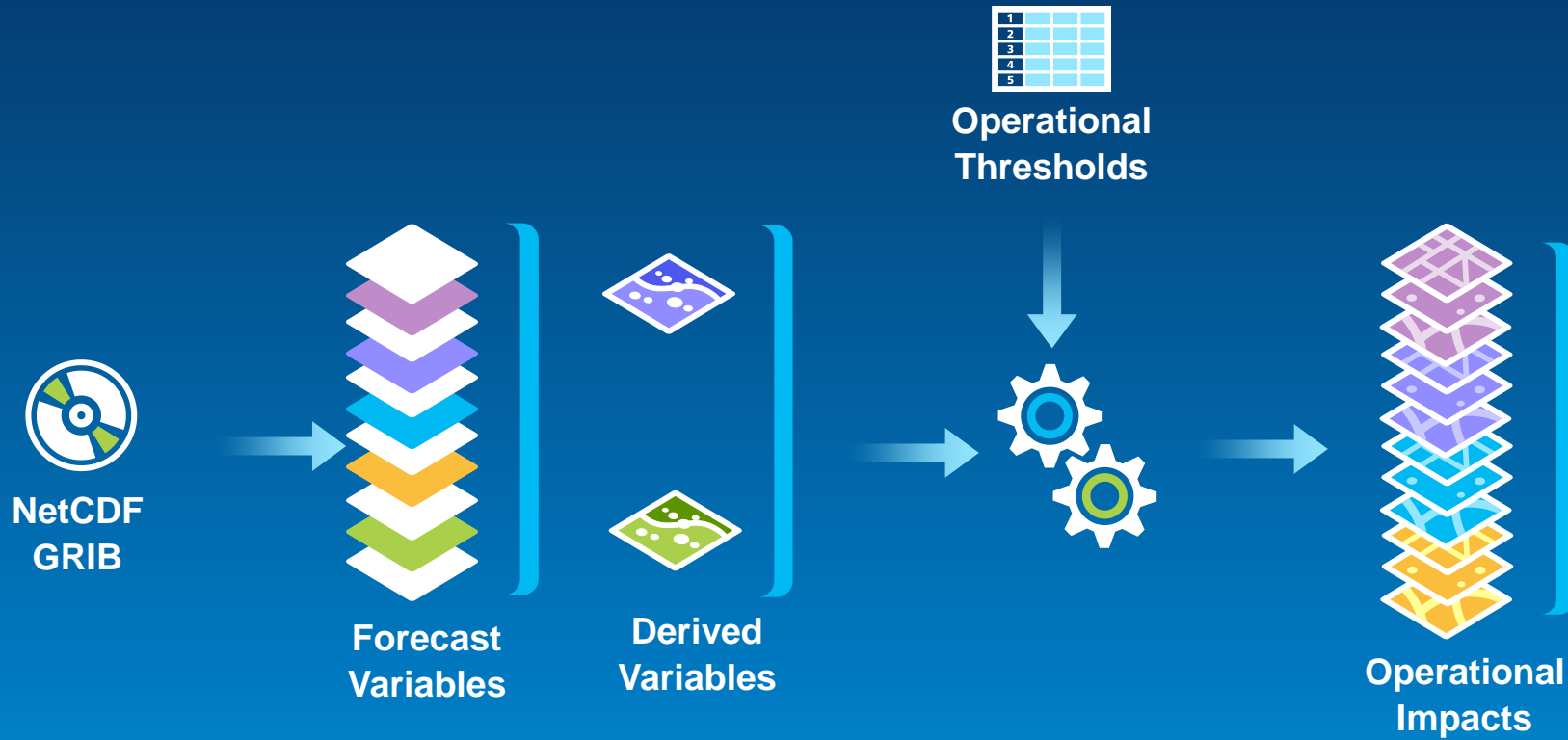


Forecast
Variables

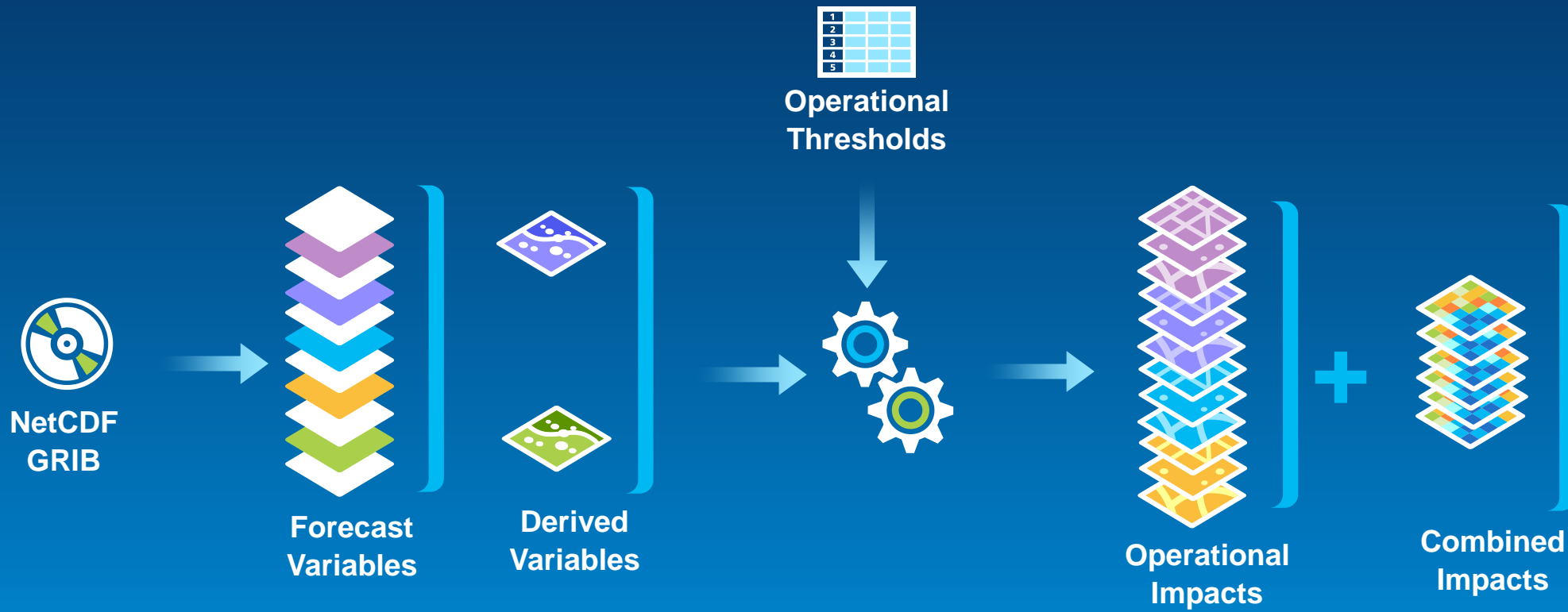
Process forecast variables



Process forecast variables



Process forecast variables



Demo

Military Aspects of Weather



Analyzing the Operational Environment

Operational Environment

Operational Factors

Terrain Analysis

Weather Analysis

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Session ID: 167

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a session evaluation form!**



Understanding our world.

