

Fourth Beirut Water Week

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INVENTORY OF
SHARED WATER
RESOURCES IN
WESTERN ASIA

**Assessing Transboundary Water Resources
in the Middle East**

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ESCWA-BGR Water Project

OUTLINE

I. Part one: About the inventory

- i. What is the Inventory?
- ii. Objectives of the Inventory
- iii. Work Process

II. Part two: Presentation of results

- i. Chapter contents
- ii. Listing of basins and aquifer systems identified
- iii. Regional maps
- iv. Specific shared aquifer system maps: The Mashrek

What is the Inventory?

The Inventory is the first UN-led **effort to take stock of the region's shared surface and groundwater resources** in a comprehensive, systematic and standardized manner.

- ◆ Hydrogeology/ Basin hydrology
- ◆ Water resources development and use
- ◆ Status of cooperation and management
- ◆ The Inventory covers the Western Asia Region, in its geographic boundaries



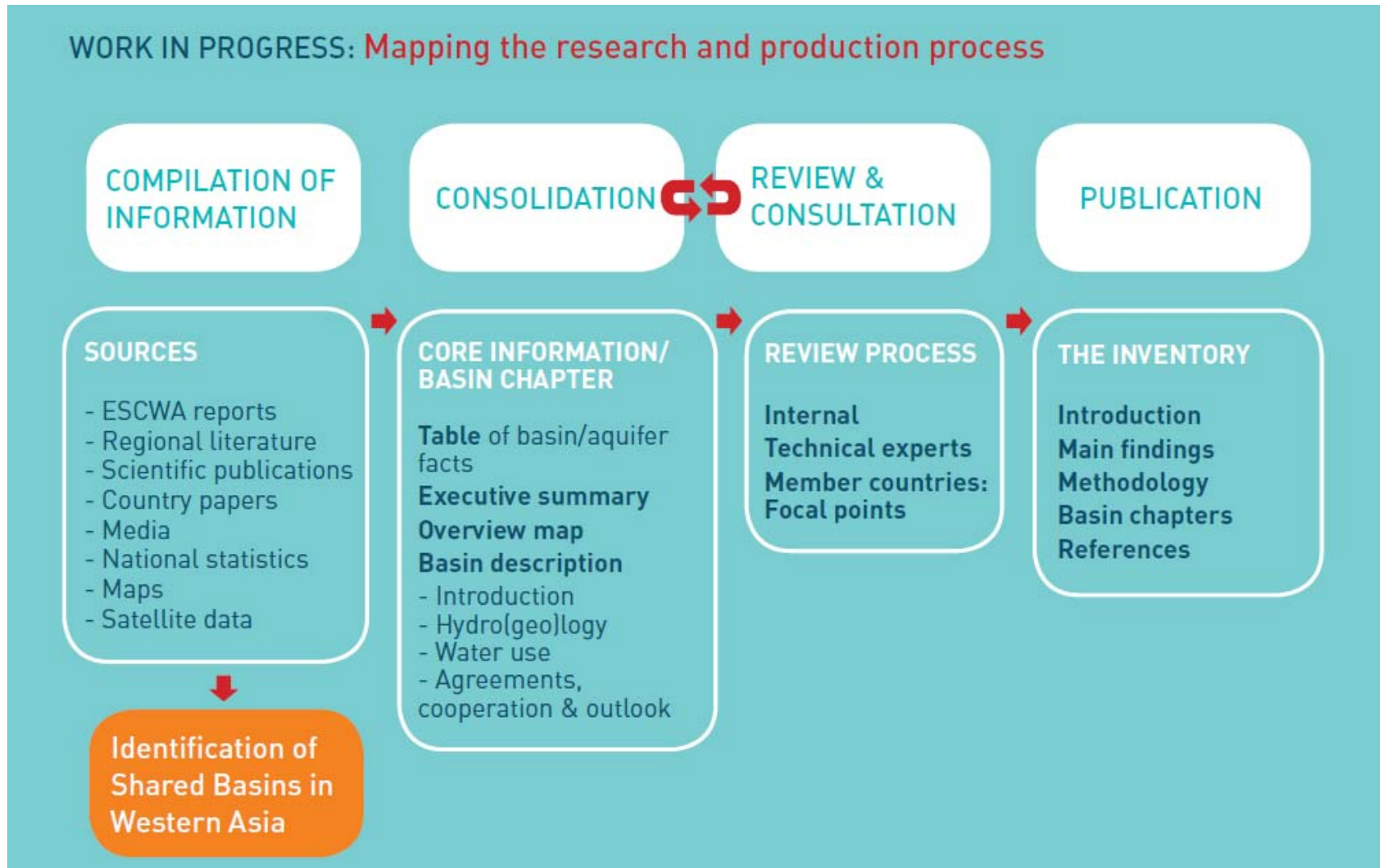
Objectives of the Inventory

- ◆ **Document** the state of shared water resources and their use
- ◆ **Improve the knowledge base and facilitate access** to information on shared water resources.
- ◆ **Create awareness** among decision makers, experts and the general public
- ◆ **Stimulate an informed discussion** within and among riparian countries
- ◆ **Support regional processes** towards improved dialogue and cooperation over shared water resources (e.g. 'Legal Framework')



Inventory: Work Process

WORK IN PROGRESS: Mapping the research and production process





Geography/Introduction



SURFACE WATER

Geography

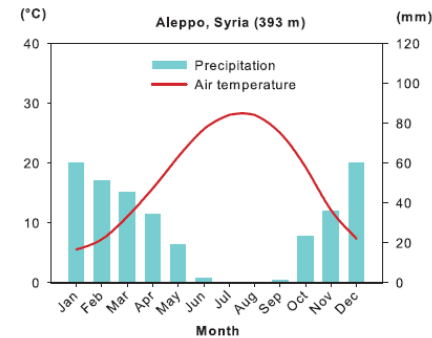
- River Course
- Climate
- Population

GROUNDWATER

Introduction

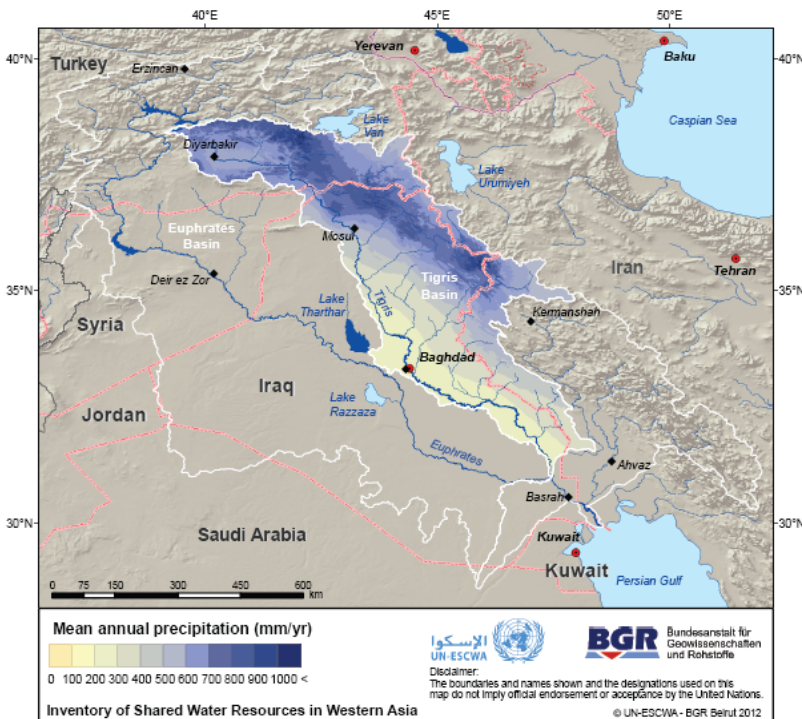
- Area
- Climate
- Population
- Other Aquifers in the Area

Figure 2. Climate diagram for Aleppo, Syria, in the Qweik Basin



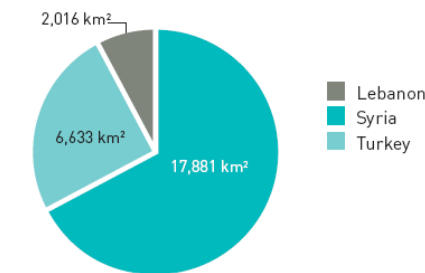
Source: Compiled by ESCWA-BGR based on data provided by Worldclim, 2011; Climate Diagrams, 2009; Phytosociological Research Center, 2009.

Figure 3. Mean annual precipitation in the Tigris Basin



Source: Compiled by ESCWA-BGR based on data provided by Worldclim, 2011.

Figure 1. Distribution of the Orontes Basin area



Source: Compiled by ESCWA-BGR.



Hydrology/Hydrogeology



SURFACE WATER

Hydrological Characteristics

- Annual discharge variability
- Flow regime
- Groundwater Linkages

GROUNDWATER

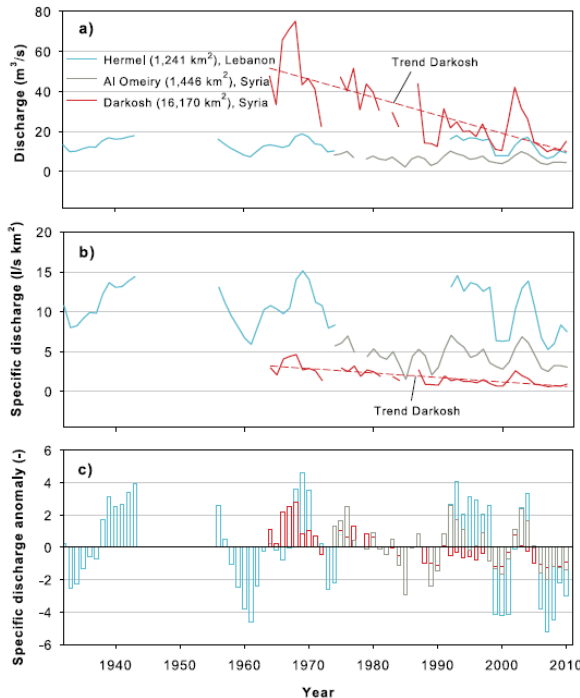
Hydrogeology - the Aquifer System

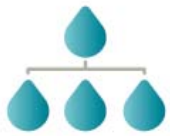
- Aquifer Configuration
- Stratigraphy
- Aquifer Thickness
- Aquifer Type
- Aquifer Parameters

Hydrogeology - groundwater resources

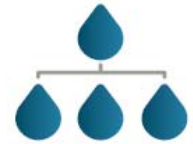
- Recharge
- Flow Regime
- Storage
- Discharge
- Water Quality

Figure 4. a) Mean annual discharge, b) specific mean annual discharge and c) discharge anomaly time series of the Orontes (1932-2010)





Water Resources Management/ Groundwater Exploitation



SURFACE WATER

Water Resources Management

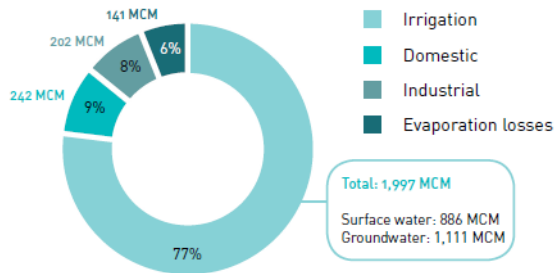
- Development and Use
- Water quality and environmental issues

GROUNDWATER

Groundwater exploitation

- Abstraction and Use
- Quality Issues
- Sustainability Issues

Figure 6. Mean water use across sectors in the Orontes Basin in Syria for the period 1992-2009



Source: Compiled by ESCWA-BGR based on data provided by Ministry of Irrigation in the Syrian Arab Republic, 2012.



Shared Surface Water Basins List

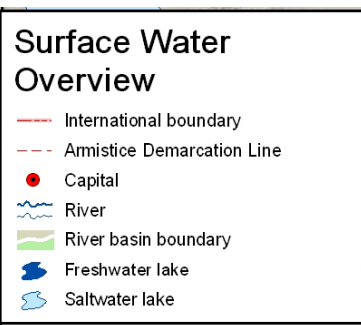
		ESCWA member countries													Non-ESCWA		
Shared Surface Water Basins		BAHRAIN	EGYPT	IRAQ	JOR	KUWAIT	LEB	OMAN	PAL	QTR	KSA	SYR	UAE	YEM	IRAN	ISR	TUR
MESOPOTAMIA	Euphrates Basin			•								•					•
	Tigris Basin			•								•			•		•
	Shatt El Arab			•											•		
MASHREK	Jordan River Basin				•		•		•			•				•	
	Orontes						•					•					•
	Nahr el Kabir						•					•					
	Qweik											•					•



Regional Maps

Shared River Basins

- 🟢 Jordan River
- 🟢 Orontes River
- 🟢 Euphrates-Tigris-Shatt Al Arab
- 🟢 El Kebir River
- 🟢 Qweik River



Inventory of Shared Water Resources in Western Asia

Disclaimer
The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

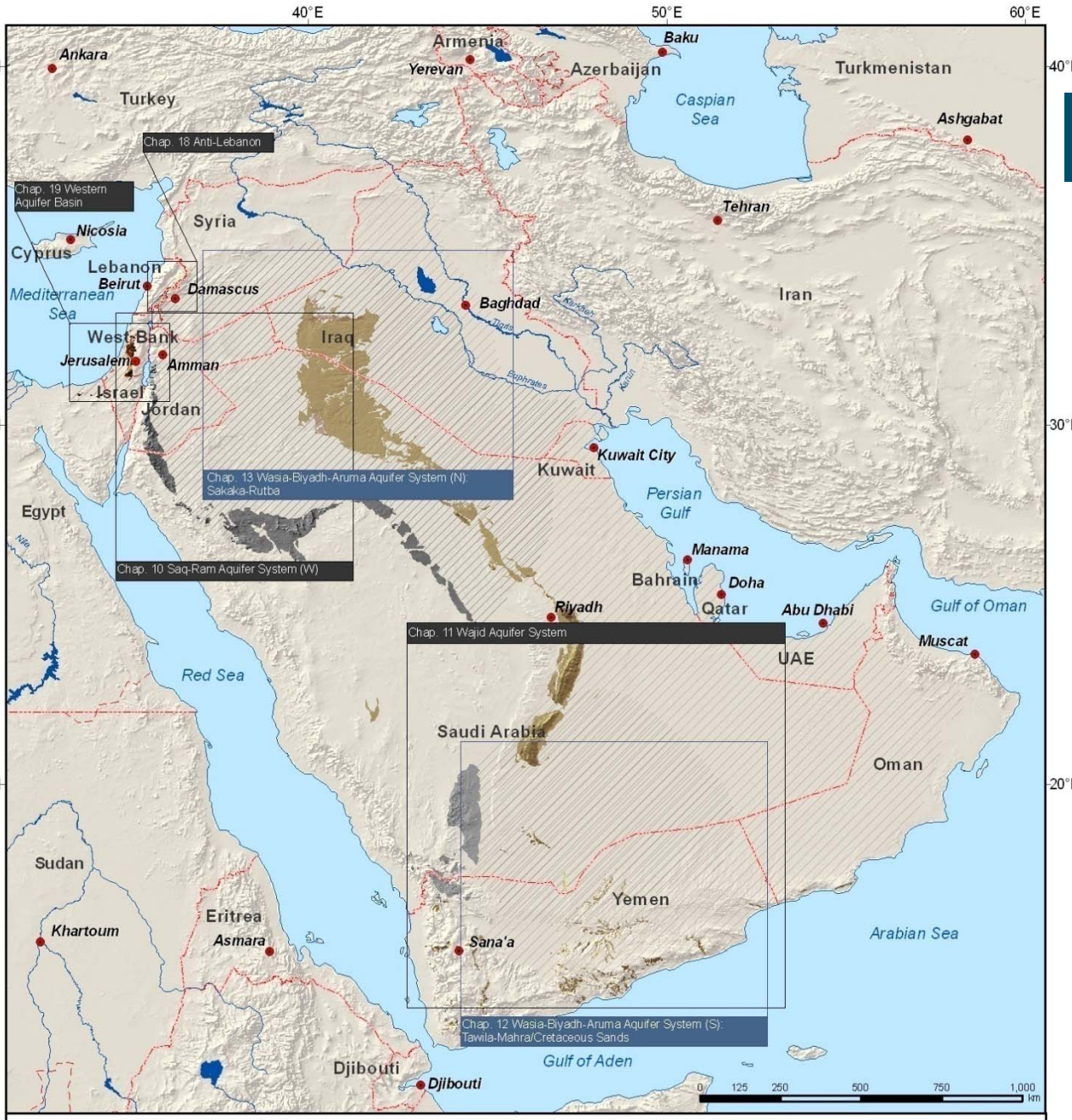
BGR Bundesanstalt für Geowissenschaften und Rohstoffe

UN-ESCWA - BGR Beirut 2013



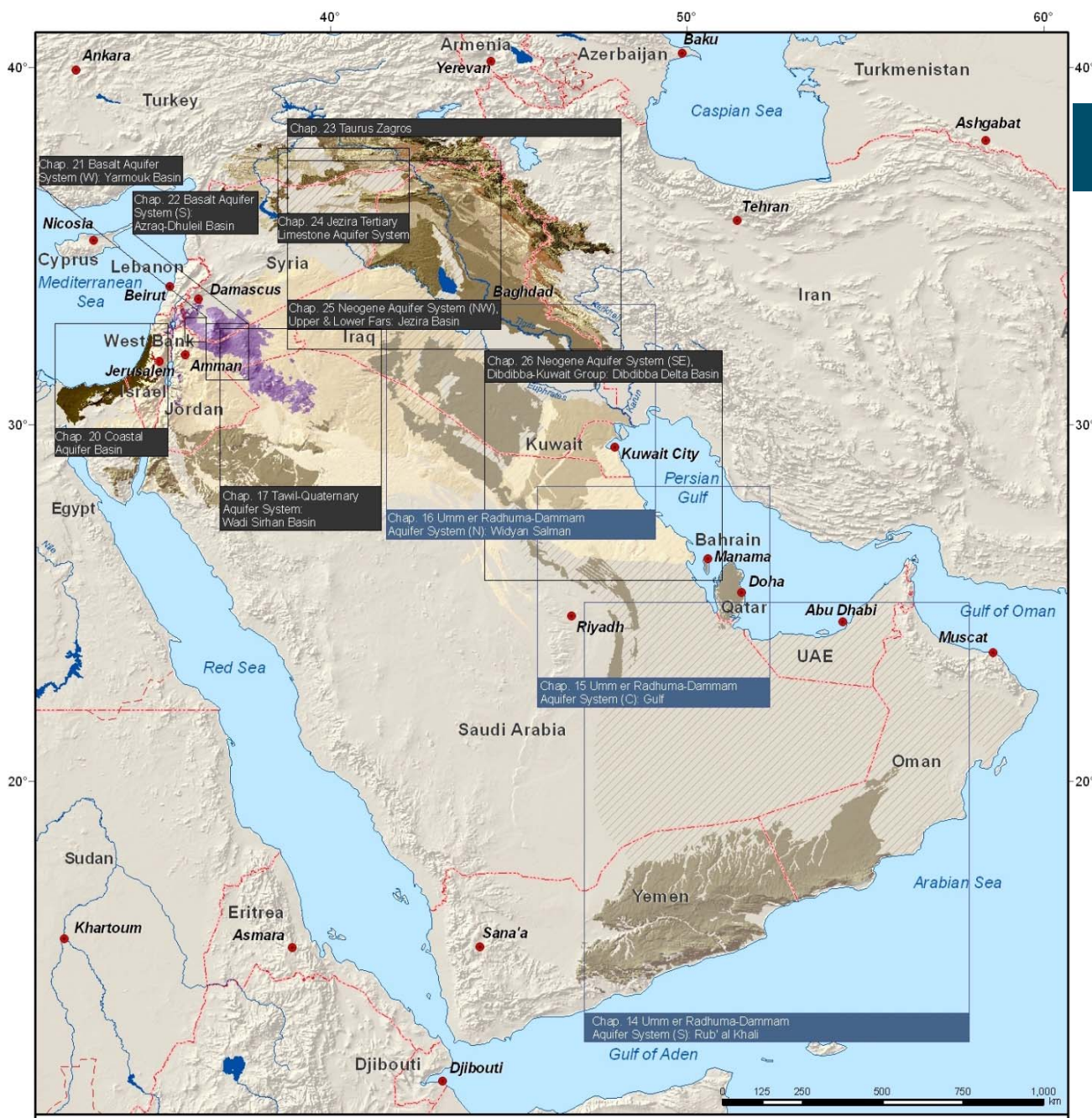
Shared Aquifer Systems List

	ESCWA member countries													Non-ESCWA			
	Shared Aquifer Systems	BAH	EGY	IRQ	JOR	KUW	LEB	OMA	PAL	QTR	SAU	SYR	UAE	YEM	IRN	ISR	TUR
ARABIAN PENINSULA	Saq Ram				●						●						
	Wajid										●			●			
	Wasia Biyadh Aruma (S): Tawila-Mahra / Cretaceous Sands										●			●			
	Wasia Biyadh Aruma (N): Sakaka-Rutba			●							●						
	U er R' Dammam (S): Rub' El Khali							●			●		●	●			
	U er R' Dammam (Center): Gulf	●								●	●						
	U er R' Dammam (N): Widyan-Salman			●		●					●						
	Tawil-Quaternary: Wadi Sirhan Basin				●						●						
THE MASHREK	Anti-Lebanon						●					●				●	
	Western Aquifer Basin		●						●							●	
	Coastal Aquifer Basin		●						●							●	
	Basalt (W): Yarmouk Basin				●							●					
	Basalt (SE): Azraq Basin				●							●					
MESOPOTAMIA	Taurus-Zagros			●										●			●
	Jezira Tertiary Limestone											●					●
	Neogene (NW) - Upper and Lower Fars: Jezira Basin			●								●					
	Neogene (SE) Dibdibba – Kuwait Group			●		●						●					



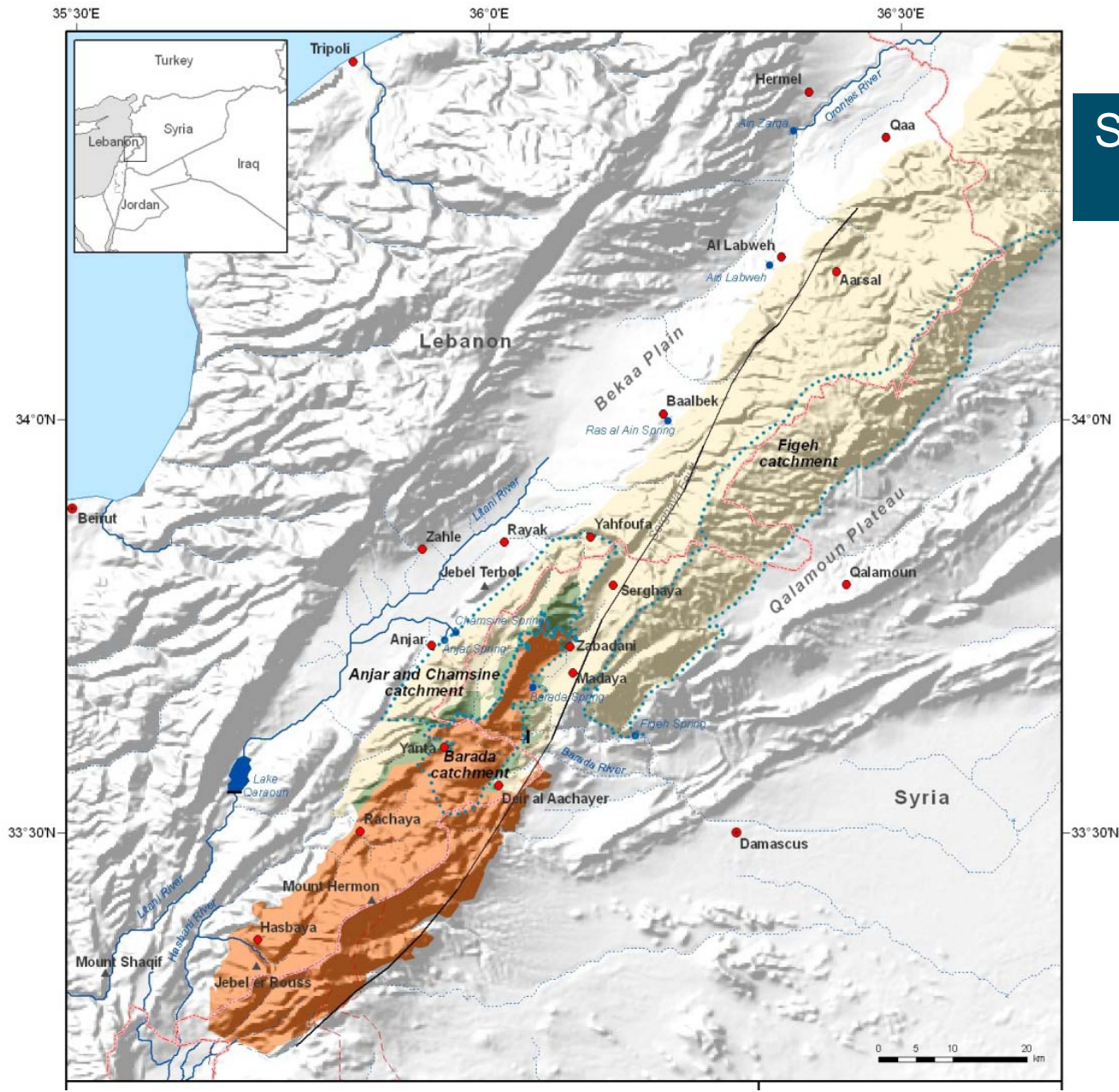
Regional Maps

Shared Aquifer Systems Mesozoic and Paleozoic Era



Regional Maps

Shared Aquifer Systems Cenozoic Era

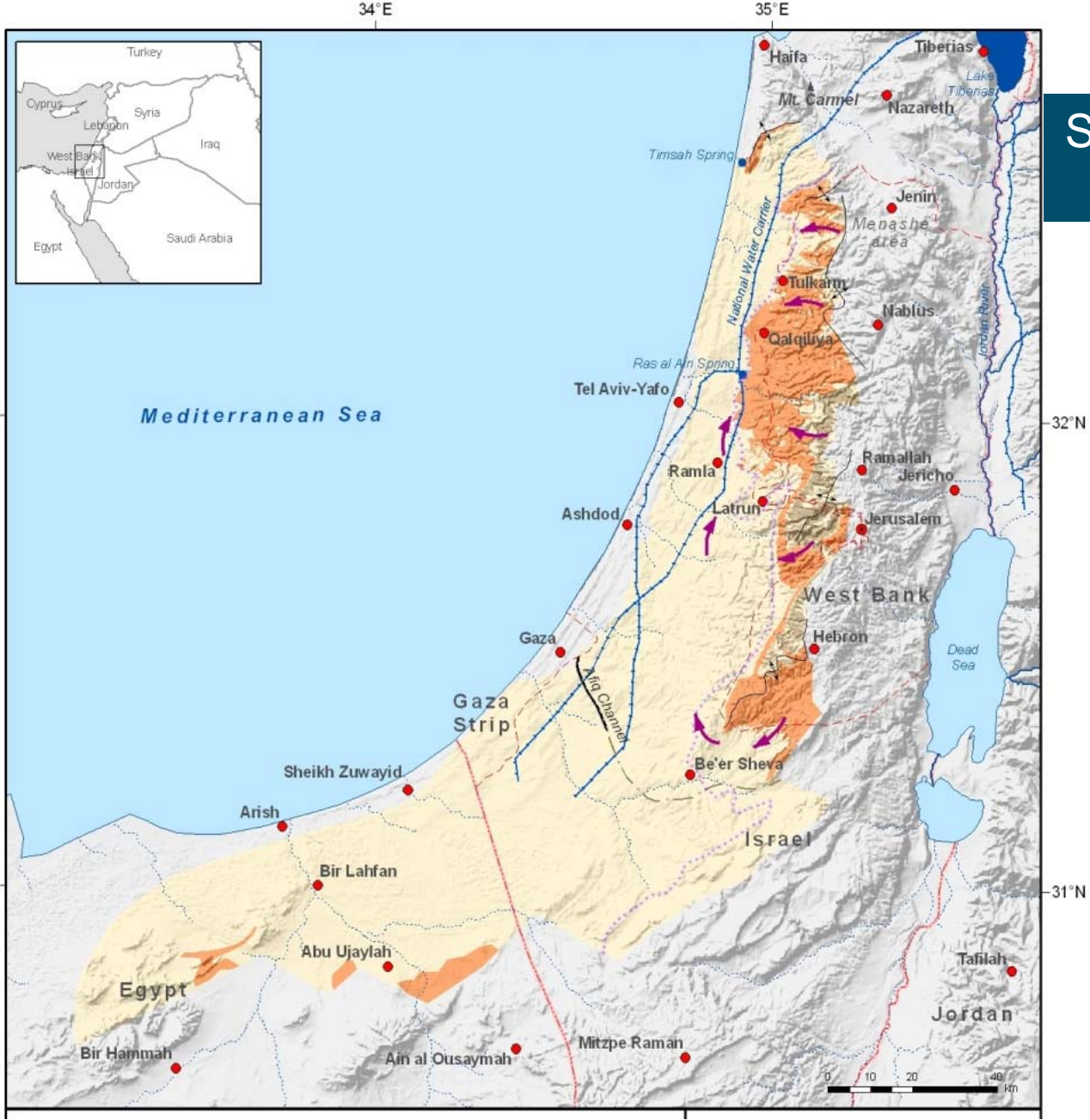


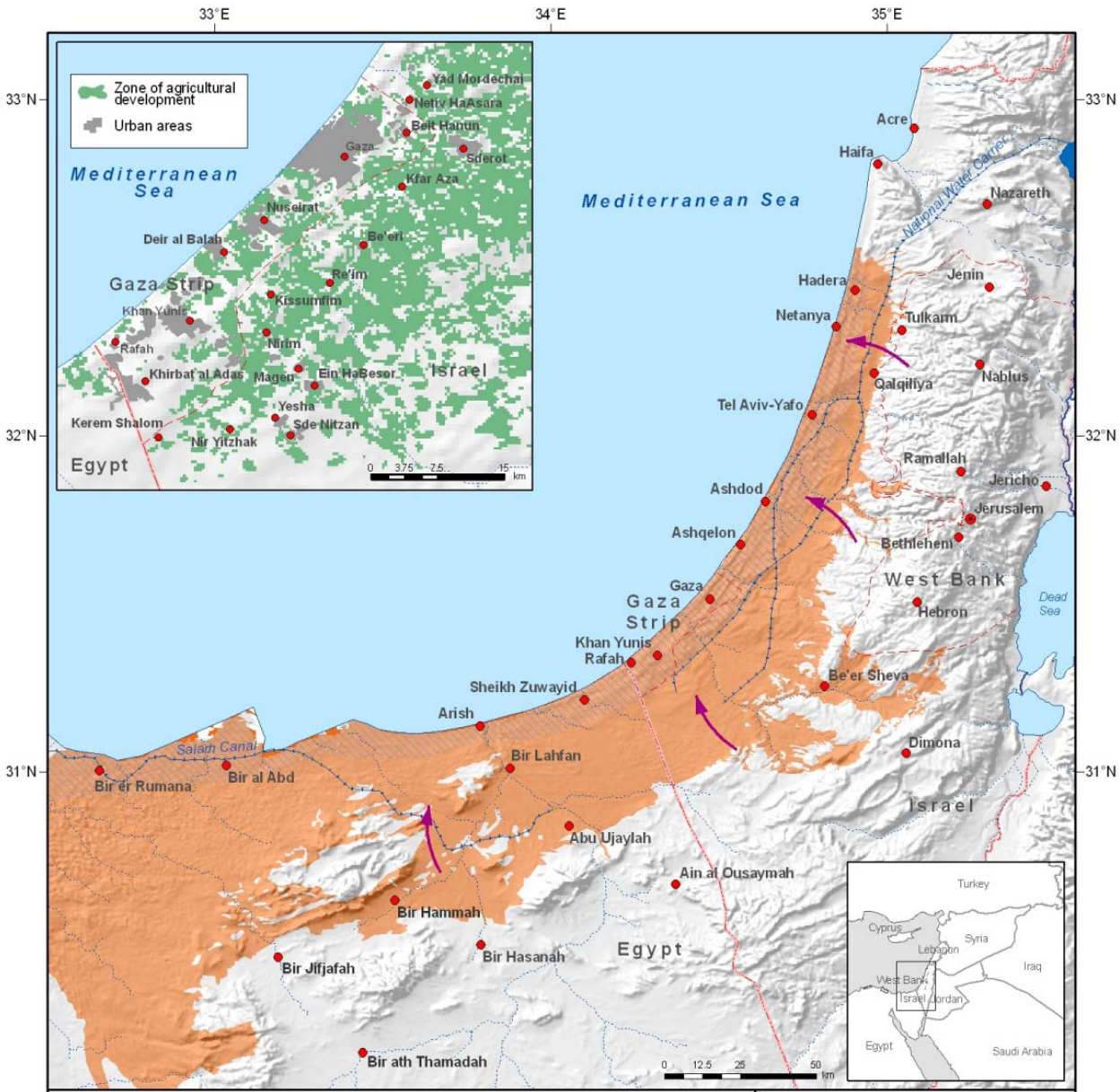
Shared Aquifer Systems in the Mashrek

Anti-Lebanon

Shared Aquifer Systems in the Mashrek (cont.)

Western Aquifer Basin



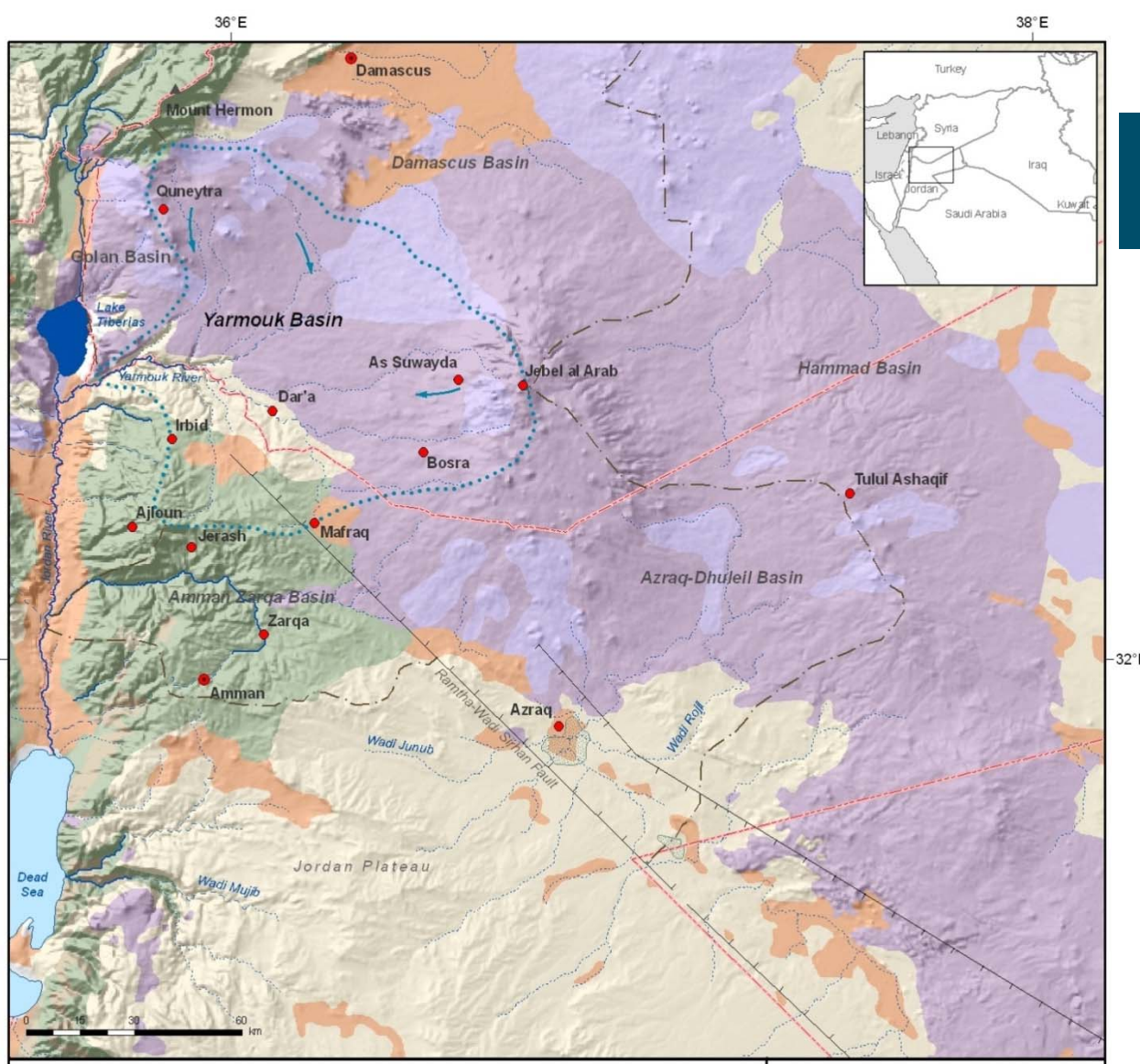


Shared Aquifer Systems in the Mashrek (cont.)

Coastal Aquifer Basin

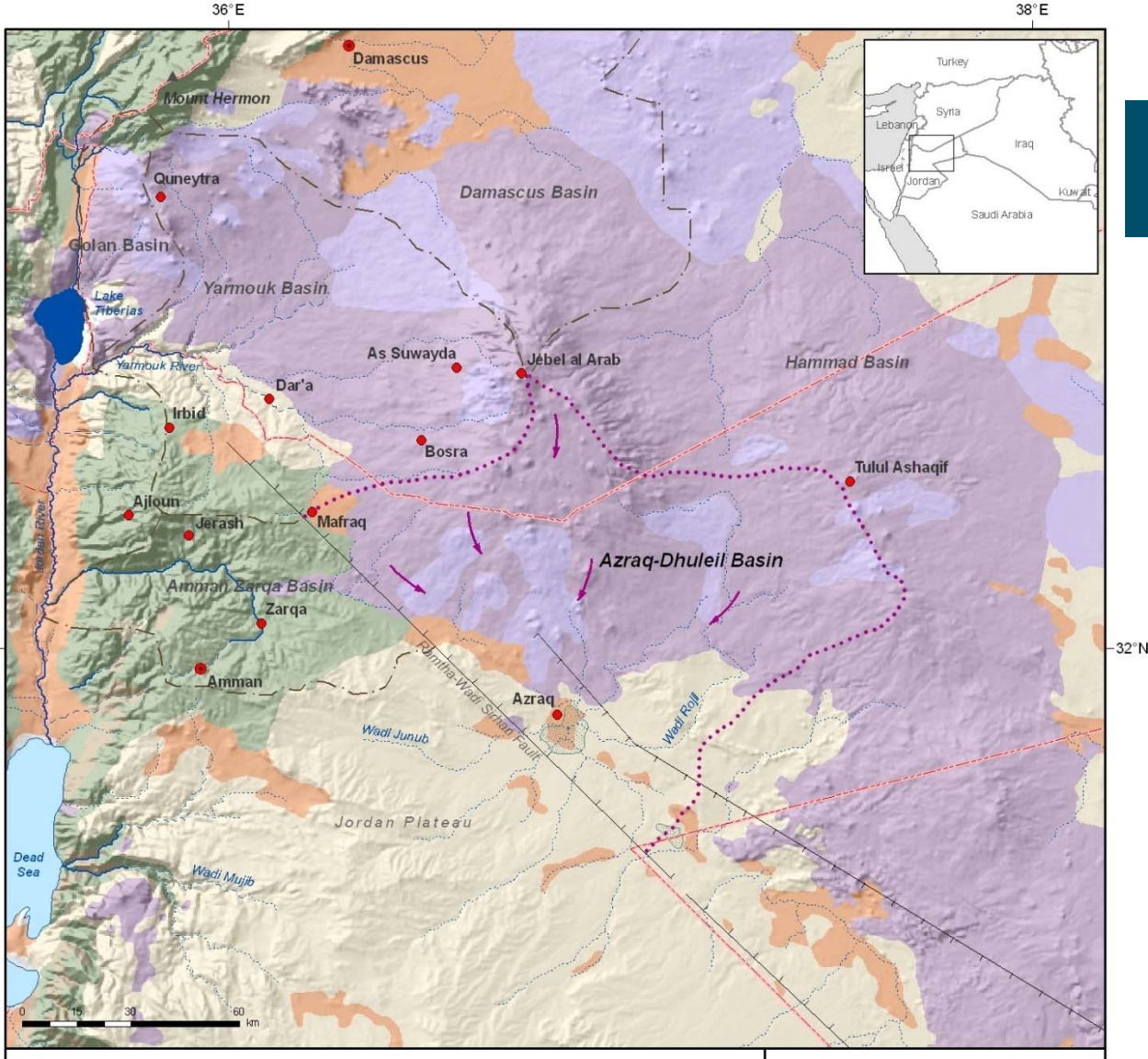
Shared Aquifer Systems in the Mashrek (cont.)

Basalt Aquifer System (W): Yarmouk Basin



Shared Aquifer Systems in the Mashrek (cont.)

Basalt Aquifer System (S): Azraq-Dhuleil Basin





Inventory: Wrap-up


Conclusions from the Process

- Descriptive, scientific **baseline** for further dialogue on shared surface and groundwater resources is available
- Inter-active consultative process with countries has enhanced the value of the product
- The process itself has created awareness and stimulated dialogue
- Technical working group under the ESCWA Committee on Water Resources is in place.

Remaining Challenges

- Carry on momentum within and beyond the Working Group
- Further conceptual work in dealing with shared aquifer systems needed
- completion, validation and updating of baseline information
- Causal/analytical assessment (i.e. DPSIR)
- Horizontal expansion (i.e. new ESCWA members / North Africa)
- Integrating science into policy
- **Enhance cooperation on the ground**
- Move beyond water allocation





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دراسة مسح الموارد المائية المشتركة
في غرب آسيا

www.waterinventory.org

Thank you for your attention.