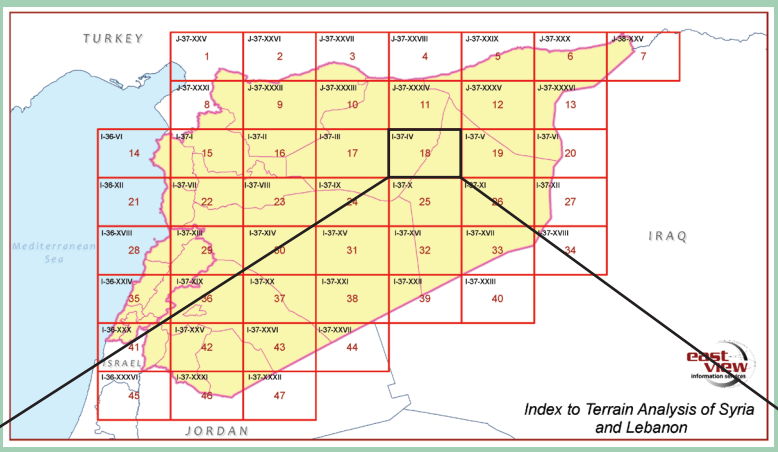
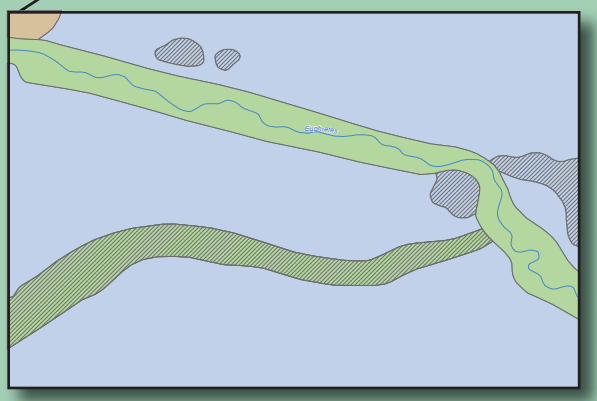
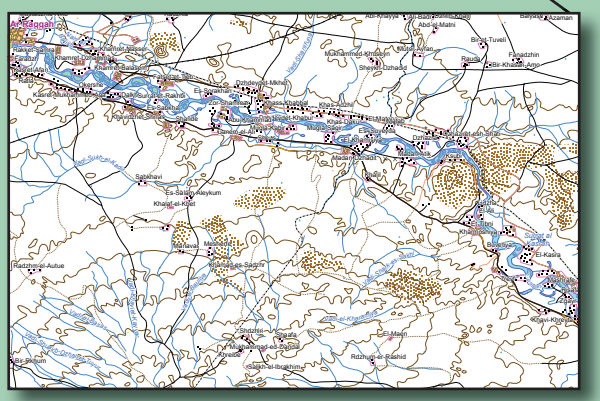
Terrain Analysis of Syria and Lebanon

A descriptive and visual geographic knowledge base of population, roads, topography and soils, hydrography, vegetation and climate







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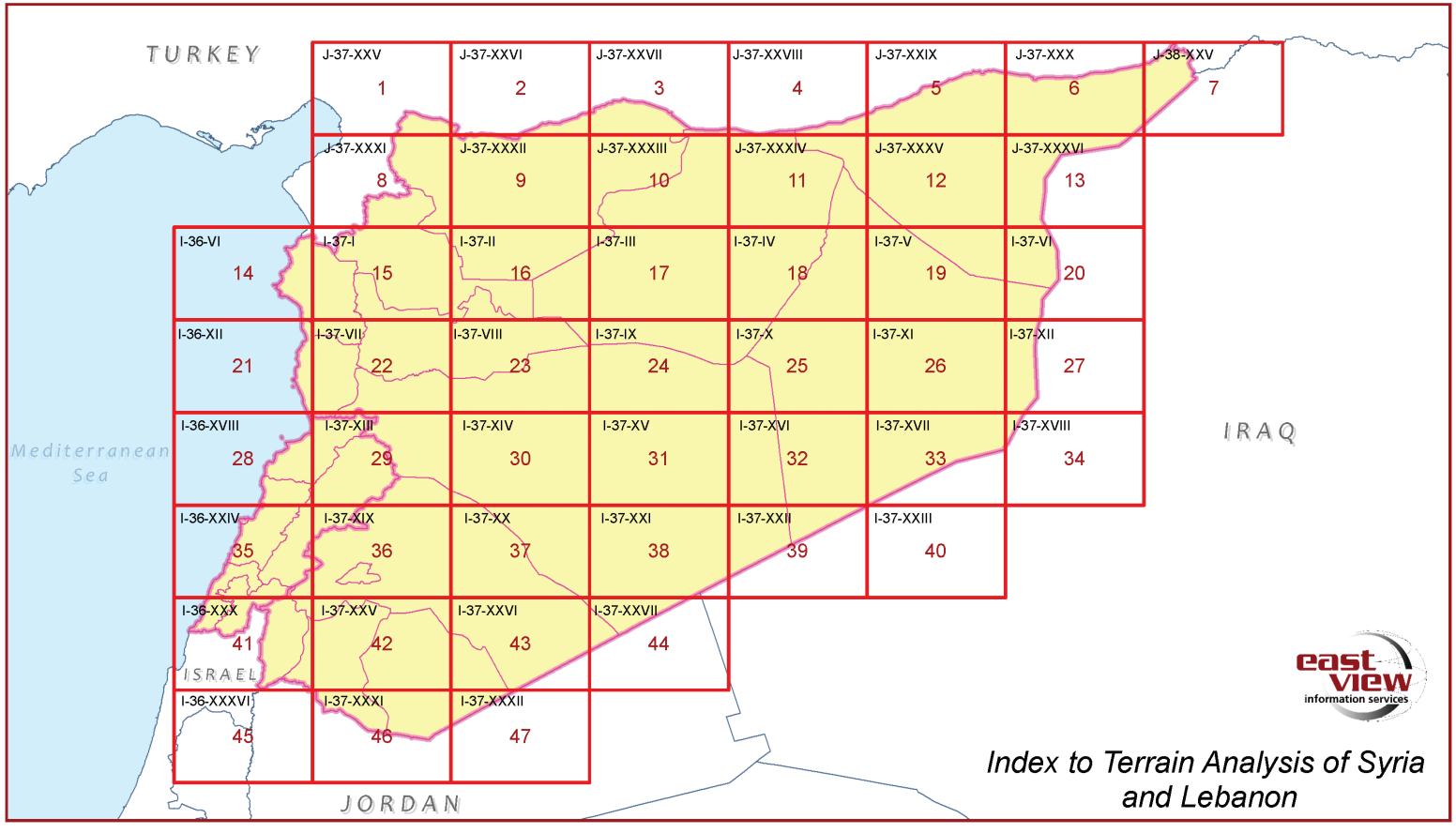
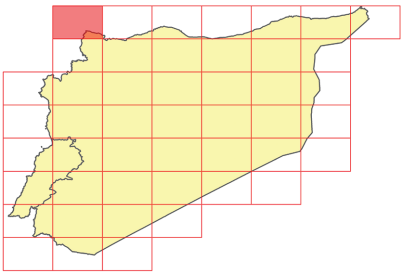


1. OSMANIYE



Map Sheet Number: **J-37-XXV**

Map Sheet Coordinates: **36°E – 37°E**
36°40'N – 37°20'N

Countries: **Syria**
Turkey

Populated places. The city of Osmaniye (pop. 209,000, 2012) is a trading and industrial center in southeastern Turkey, and a highway hub. It has light- and food-industry enterprises, a tile factory, and many cottage industries. The cities of Yakacik, Islahiye, Dortyol, Yesilkent, Bahce, and Hassa (pops. from 10,000 to 25,000) are small trading centers of agricultural areas with local industrial enterprises. Islahiye and Dortyol are highway hubs. The cities have no uniform layout system. Development is predominantly sparse in Osmaniye and Dortyol, and dense in other cities. Houses are one or two stories of adobe or stone, usually surrounded by blind adobe walls or *duwals*; yards are very green. Arteries are rather broad (up to 20 meters wide). Other streets are narrow and unpaved, with many dead ends. As in many Turkish cities, the center usually contains a market square, near which are a mosque and administrative buildings. Cities are very green, but lack amenities; they have only partial electrical service. Osmaniye, Islahiye, Dortyol, and Hassa have running water, which supplies some enterprises and a small portion of residential houses. Elsewhere in these cities, and in the city of Bahce, water is drawn from hand-pumped wells. Rural populated places are predominantly small (20–300 residents); only the largest villages in the coastal lowland strip have over 1,000 people. Rural villages have asystematic layouts and sparse development, with houses of stone or wood, less often adobe. Homesteads are generally surrounded by blind walls or *duwals*. Many villages are farmsteads consisting of several houses. Mountain pasture areas often have summer accommodations with one or more log houses. Near the summer accommodations are camps of seminomadic Yörük and Turkmenian livestock herders consisting of several woolen tents (among the Yörüks) or felt yurts (among the Turkmenians). Some populated places along railroads and highways have electrical and telephone and telegraph service. Water is drawn from hand-pumped wells, streams, and springs. The numerous active and abandoned chromium mines (within a 7–40 km radius east and northeast of Islahiye, 18 km east of Osmaniye, and 16 km northeast of Hassa) and caves (especially common 5–16 km south and east of Dortyol) can be used as underground shelter. The Batman–Iskenderun oil pipeline with 45 cm pipe crosses the southeast, and the Kirkuk–Dortyol oil pipeline with 102 cm pipe crosses from east to west.

Roads. All railroads have one track. The Mersin–Toprakkale–Fevzipasa–Kopruagzi railroad is a main line. Railroad grades are up to 25‰, and the minimum curve radius is 250 meters. Rail weights are 30–40 kg/m. Ties are wooden or steel, and ballast is crushed stone or gravel. Axle weight limits are 12–18 tons. Locomotives are steam-powered, or diesel-powered within Syria. Toprakkale, Mamure, Fevzipasa, and Maydan Ikbis Stations have depots. Stations with running water: Toprakkale, Osmaniye, Mamure, Bahce, Fevzipasa, Maydan Ikbis, and Raju. The Mersin–Toprakkale–Fevzipasa–Kopruagzi railroad has many artificial structures, including 13 tunnels 0.2–4.7 km long; the Fevzipasa–Halab railroad has three tunnels 0.2–0.4 km long. Improved highways, including the Ceyhan–Dortyol–Iskenderun highway, a segment of European Highway E5 and State Road 1, the Maras–Islahiye–Kirikhan highway, a segment of European Highway E99 and State Road 55, and the Adana–Osmaniye–Gaziantep highway, a segment of European Highway E24 and State Roads 6 and 1, are paved with asphalt concrete, with 6- to 8-meter roadways atop a 10-meter bed. Other highways are paved with macadam or gravel on a weak base, with a 5-meter roadway (under 4 meters in the mountains); heavy traffic quickly destroys these roads. Improved dirt roads are mostly narrow (3–5 meters), and their beds are reinforced with gravel or crushed stone, but sometimes not over their entire lengths. Dirt roads become muddy and difficult to negotiate in the rain, especially for wheeled vehicles. Highway bridges are reinforced concrete or stone with 30- to 60-ton weight limits. Old stone and wooden bridges have weight limits under 10 tons, occasionally more.

Topography and soils. The area is mostly alpine forest, difficult for motorized vehicles to negotiate off-road. The northwest is occupied by low horns of the Binboga Range, the center by the Gavur Mountains, and the southeast by the Jabal al Kurd Mountains. The mountain ranges are divided by broad valleys and basins 16–20 km wide, which the main communication routes follow. The Gavur Mountains 1,000–1,700 meters ASL, with Mount Migir Tepesi, the highest point in the area at 2,240 meters ASL, form a difficult natural barrier. The range's crest is rather narrow, and only small parts of it are flat and broad. The tops are mostly rounded; some are angular. The sides are steep (20–35°, sometimes more), sometimes sheer or precipitous or covered with rocky placers. The sides are dissected by narrow, deep valleys, often like gorges, and by hollows and gullies. In the Bahce–Fevzipasa area, where the range is not as high, it is crossed by a railroad and road; elsewhere, communication routes in the mountain belt are trails and narrow mountain dirt roads often impassable by motorized vehicles. The western and southeastern mountain belts are considerably lower (400–1,200 meters) than the Gavur Mountains; the mountainsides are not as steep (8–15°), and the mountaintops and crests are flat. However, the mountains are well dissected and mostly covered with forest, which makes them inaccessible for motorized vehicles off-road. The broad through valleys and basins that divide the mountains offer convenient passes. The bottoms of most valleys are flat, only sometimes disturbed by isolated hilly rises. Off-road travel will be impeded in places by a dense network of streams and irrigation canals, and some parts of the valley floors are swampy. The mountains are separated from the Gulf of Iskenderun by a narrow strip of coastal lowland.

Soils in the mountains are rubbly loams or rubbly sandy loams. Rocky soils crop out on the mountain crests and in mountainside cliffs. The intermontaine valleys and the coastal lowland are dominated by loams and sandy loams with inclusions of pebbles and gravel. The water table lies from 1–2 to 10 meters below the surface in the valleys; it is 30–60 meters or more below the surface on the mountainsides. At the feet of mountains, the water table often reaches the surface as springs; sometimes the water there is slightly mineralized but fit to drink. The area is seismically active; earthquakes here have reached 7 points on the Modified Mercalli Scale.

Hydrology. The Ceyhan River is one of Turkey's major rivers. It is 40–100 meters wide and 2–3.5 meters deep, with currents of up to 1 m/s. The bottom is sandy-pebbly, sometimes rocky in the mountains. The river flows between steep, high banks in the mountains; its banks are predominantly low and gently sloping with a sinuous, braided channel on the plain. The flood plain is broad (0.2–1.5 km) and dry. Other streams are small, under 20 meters wide and under 1 meter deep. Mountain streams have fast currents and rocky bottoms.

Regime. The rivers do not freeze; they are bank-full in winter (1.5–2 meters above low water), due to abundant rains, especially in February. Spring high water (April and May), caused by snow melting in the mountains, is also accompanied by considerable rises in river water levels. Very large storm surges on the Ceyhan River can raise its level 3 meters or even more; in such high surges, the river leaves its banks and floods extensively, inundating all the lowlands. During high storm surges, mountain streams become raging torrents difficult to cross. The low water season on rivers lasts from June to October; all streams become very shallow at this time, and some shallow rivers dry up.

Seacoast. The Gulf of Iskenderun indents the land for 64 km, and is 35 km wide. The bay's shores are low, with broad sandy beaches fringed by low dunes. Water depths along the coastline rise gradually; the 5-meter depth contour is 0.1–1.7 km offshore, and the 10-meter contour is 0.3–3 km offshore. The coastline south of Cinkale has many submerged rocks and crags. The bottom is level and sandy, sometimes sandy-rocky. Storms occur rarely, predominantly in fall and winter; wave heights in high seas can reach 4.5–5 meters. There are no convenient anchorages; Cinkale has a small mooring near Yakacik.

Vegetation is predominantly mixed forest (pine, oak) favoring pine on the lower slopes below 1,200 meters ASL, and coniferous forest (pine, juniper, fir, spruce, cedar) on the upper slopes. From 1,500 to 1,800 meters ASL, the dominant species is juniper. Forests are not as thick on the mountainsides as in the valleys. Forests have been heavily logged on gently sloping mountainsides; cuts are overgrown with dense brush and understory of the dominant species. Mountainsides below 700 meters ASL support shrubs (filbert, honeysuckle, barberry, myrtle, oleander, etc.), mostly very thick and difficult to negotiate, similar to *maquis*. Cultivated lands in valleys and basins are planted with grains (wheat, barley) as well as cotton and tobacco. Near populated places, large areas are devoted to orchards and vineyards.

Climate. *Winter* (December to February) is very mild in the valleys and basins and mild in the mountains. Prevailing daytime temperatures are 10–15° in the valleys and basins and 5–8° in the mountains above 1,000 meters ASL. Nighttime temperatures are 7–10° in the valleys and basins and

0–5° in the mountains. There are isolated days with mild frosts (record low −5°), but frosts are harder in the mountains (down to −20°). Precipitation is lightest in winter. It falls often (ten to 15 days with precipitation per month), as rain, sometimes as downpours. Snow falls rarely and melts quickly. Snow cover lasts all winter in the mountains above 1,500 meters ASL. Winter cloudiness is variable; cloudy days (ten to 12 per month) alternate with clear, sunny ones (three to eight per month).

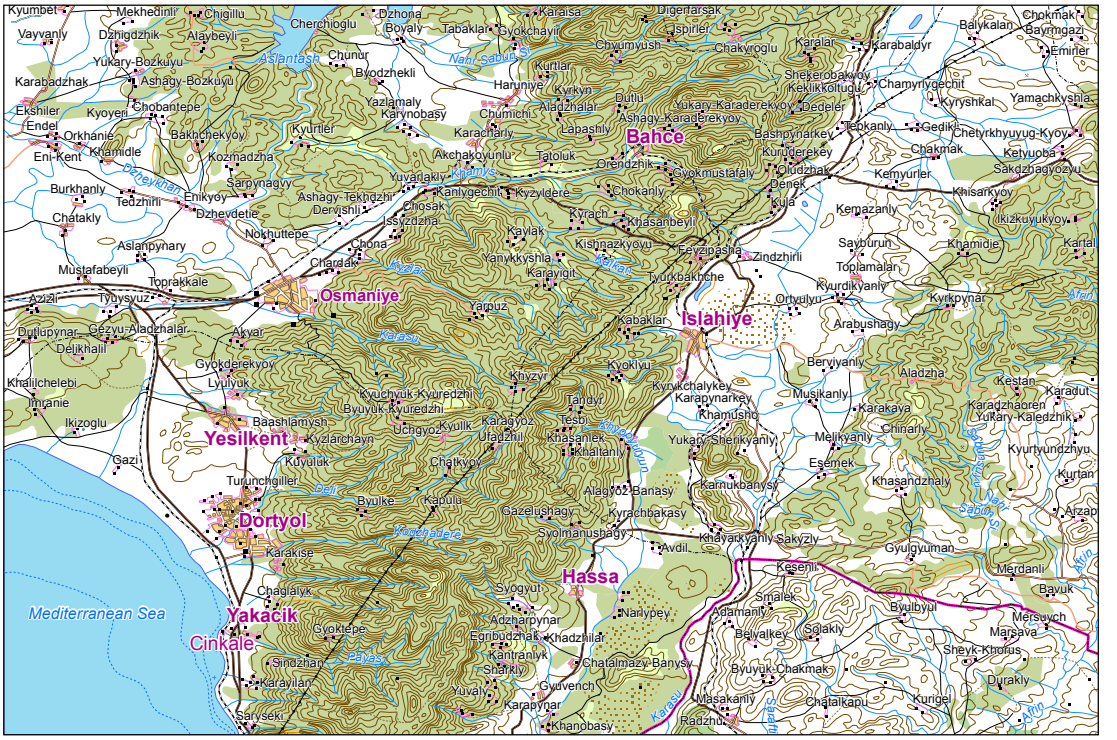
Spring (March and April) is characterized by rapidly rising temperatures; night frosts generally occur only in the mountains. Considerably less precipitation falls than in the winter months; it occurs as light, brief rains, sometimes as downpours. Snowfall is possible in the mountains. The weather is mostly cloudless; observation conditions from the air are considerably better than in winter.

Summer (May to mid-October) is hot and dry. Prevailing temperatures are 24–30°C in the daytime (record high 42°C) and 18–26°C at night. Temperatures are 4–5°C lower in the daytime and at night in the mountains above 1,000 meters ASL than in the valleys and basins. In the west, precipitation falls four to six times per month; in the east, it falls predominantly in the first half of the season, and the second half of summer there is often rainless (sometimes no rain falls for a month or two). Cloudiness is variable in summer, and clear days predominate.

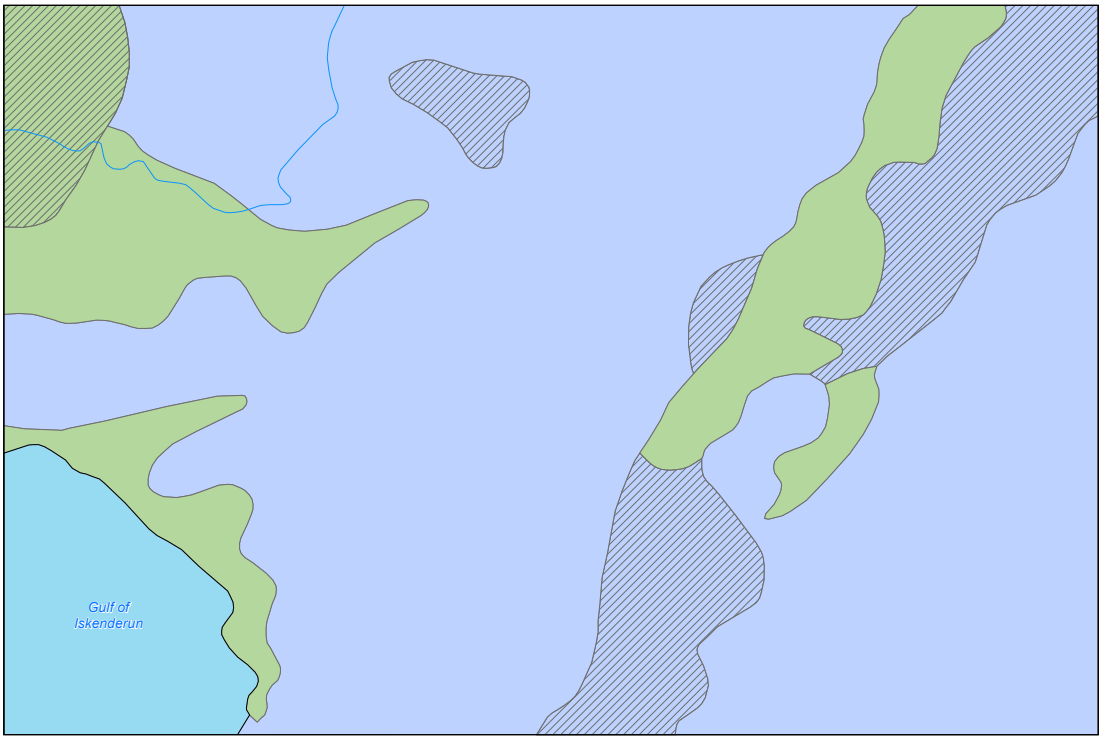
Fall (mid-October to November) is rainy. The second half of fall in the mountains is cool, with prolonged drizzles (several days in a row).

Winds are predominantly easterly or southwesterly during the year. Summer is characterized by local mountain valley winds (up the valleys and mountainsides in the daytime and back at night) in the mountains, and breezes that blow from the sea to the land in the daytime and back at night on the coast.

1. Osmaniye (J-37-XXV)



Soil Map



River / stream

Hydrology

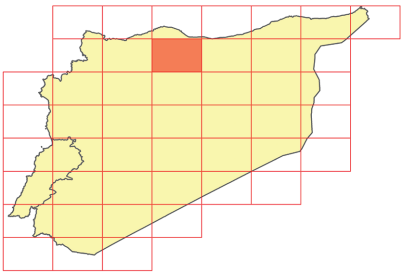
Loams and sandy loams with pebble and gravel inclusions, sometimes swampy

Loams with gravel and pebble inclusions

Rubbles and loams or rubbles and sandy loams

Rubbles and loams or rubbles and sandy loams with pebble and gravel inclusions, sometimes swampy

10. MASKANAH



Map Sheet Number: **J-37-XXXIII**

Map Sheet Coordinates: **38°E – 39°E**
36°N – 36°40'N

Countries: **Syria**

Populated places are rural, with 100–800 residents; some have 1,000–4,000. Village layout is asystematic and dense, sparse in some villages. Houses are one story of adobe or sun-dried brick with flat roofs. The traditional form of residential construction is also houses of sun-dried brick in the shape of a dome 4–5 meters high topped by a conical point. This type of house usually has no windows (or very small windows) and is built in direct contact with its neighbors. The east contains summer accommodations, temporary habitations consisting of one or two houses, and the center and west have temporary camps of nomadic livestock herders, consisting of several woolen tents. Populated places draw their water from streams, irrigation canals, hand-pumped wells 5–80 meters deep, and small rainwater collection cisterns called *birkets*. The water in some hand-pumped wells is slightly saline to brackish, marginally fit to unfit for drinking. In summer, the water levels and capacities of hand-pumped wells generally fall sharply (some dry up completely), the water becomes even saltier. Several villages along main roads have telephone and telegraph service. Active and abandoned building stone mines and adits near the towns of Qasaq Shamali, Qasaq Qibli, Magharatayn, and Qukhar in the north can be used as underground shelter.

Roads. The Halab–Dayr az Zawr improved highway is paved with asphalt, with 6- to 7-meter roadways atop 10- to 12-meter beds. Highways are paved with gravel or macadam, with 5- to 6-meter roadways. Improved dirt roads 4–8 meters wide are crowned, and their beds are reinforced with crushed stone or gravel. Dirt roads, including field roads, are negotiable by motorized vehicles only in dry weather; roads on segments with loamy and clayey soils become muddy and difficult to negotiate during the rainy season, especially for wheeled vehicles.

Topography and soils. The terrain is flat, 300–550 meters ASL, negotiable by motorized vehicles off-road. The plain's surface is gently rolling, sometimes hilly or hilly-ridgy, crisscrossed by the Euphrates River and its tributaries, and by shallow temporary stream channels called wadis. The hills are 50–90 meters high, and the ridges are 120–200 meters high. The hilltops are flat or rounded; ridge sides and hillsides slope at 5–15°, and are sometimes sheer (cliffs up to 80 meters high) and dissected by gullies. The Euphrates River Valley is 4–8 km wide; on some segments it narrows to 1 km or less. The valley floor, formed of the flood plain and several terraces, has a predominantly flat surface; sometimes the terraces are separated by precipitous scarps. The valley sides slope 5–10° (10–20° in gorges), sometimes with sheer cliffs up to 50 meters high, and are dissected by small streams, wadi channels, gullies, and ravines.

Soils are predominantly rubbly loams or rubbly-sandy loams, sometimes with pebble and gravel inclusions. The loose soils are 0.5–6 meters thick. They are often cemented by lime to form a very dense hard layer or "slab" with the surface up to 2 meters thick. The loose soils are underlain by semi-rocky to rocky strata (limestones, marls, sandstones) that crop out on mountainside cliffs. The river valleys contain clays and loams with pebble and gravel inclusions, or sandy-pebbly soils. The water table lies 15–80 meters below the surface on the plain, and up to 150 meters below the surface on the hillsides and mountainsides. The ground water is fresh over most of the area, saline in the east and south, fit to marginally fit for drinking; saline ground water unfit for drinking or process needs occurs less often. The area is located in a seismically slightly active zone; earthquakes here have reached 5–6 points on the Modified Mercalli Scale.

Hydrology. The Euphrates River is one of the biggest rivers in the Middle East; part of its middle reaches fall within the map area. The river is navigable by small shallow-bottomed vessels in spring and early summer. The river channel is very sinuous, often splitting into arms and channels. The main channel is 150–300 meters wide and 2 meters deep, with currents of 0.9 m/s. The river bottom is

pebbly-rocky. The banks are predominantly low, sometimes high and precipitous (cliffs up to 6 meters high). In some places, where the valley's rocky sides directly abut the river channel, the banks have sheer cliffs up to 60 meters high. The flood plain is intermittent, sometimes crisscrossed by irrigation canals. Other streams are small, 5–10 meters wide (some up to 15 meters) and under 0.5 meter deep (some up to 1 meter deep). Lake Buhayrat al Asad was built on the Euphrates River for purposes of irrigation and electric power generation (design data: area of 730 km^2, volume of 12 billion m^3). Canals are for irrigation, under 3 meters wide. Some canals are controlled on both sides by earthen levees up to 3 meters high.

Regime. The rivers and canals do not freeze in winter. On the Euphrates River, the highest water levels, which are associated with mountain snow melting (at its headwaters and in its upper reaches) and rains, occur from mid-March to early July. The maximum water-level rise, in April or May, is 3–6 meters. Stable low water is observed from early August until late October, with the minimum in September. In late fall and winter (from November to February), the river exhibits a second water-level rise due to rainfall, but the rise is considerably smaller than in spring. Other streams are bank-full from November or December to May (highest in April or May), when they receive several storm surges that raise water levels 1–2 meters. In high-water years, some rivers flood in April and May. Low water levels prevail from mid-June to October. At this time, all streams become very shallow and generally fordable; many small streams dry up. Wadi channels fill sporadically, only during rains in winter, spring, and fall, for periods from a few hours to a few days.

Vegetation. The plain has poor arid steppe and semidesert vegetation consisting mainly of cereals (bluegrass, feather grass, brome) and desert sedge with admixtures of subshrubs (locoweed, sagebrush). In spring, the steppe becomes much greener, but the grass quickly burns off by early summer, leaving the terrain a uniform gray-brown color. The river flood plains have shrubs thickets (tamarisk, willow) and small patches of forest (Euphrates poplar, oak). Arable lands are cultivated with grains (wheat, barley), legumes, industrial crops (cotton, sesame), and vines and melons. Near villages, there are orchards and vineyards.

Climate. The climate is subtropical continental.

Winter (December to February) is very mild. Prevailing temperatures in winter are 6–12°C in the daytime and 2–6°C at night. Frosts (two to 12 days with frost per month) are possible, mainly at night (record low −11°C). Up to 60% of the annual precipitation falls in winter (ten to 12 days with precipitation per month), predominantly as rains, sometimes as downpours. Snow falls rarely and melts quickly. Cloudiness is variable in winter; the number of cloudy days (seven to ten per month) generally slightly exceeds the number of clear days (five or six per month).

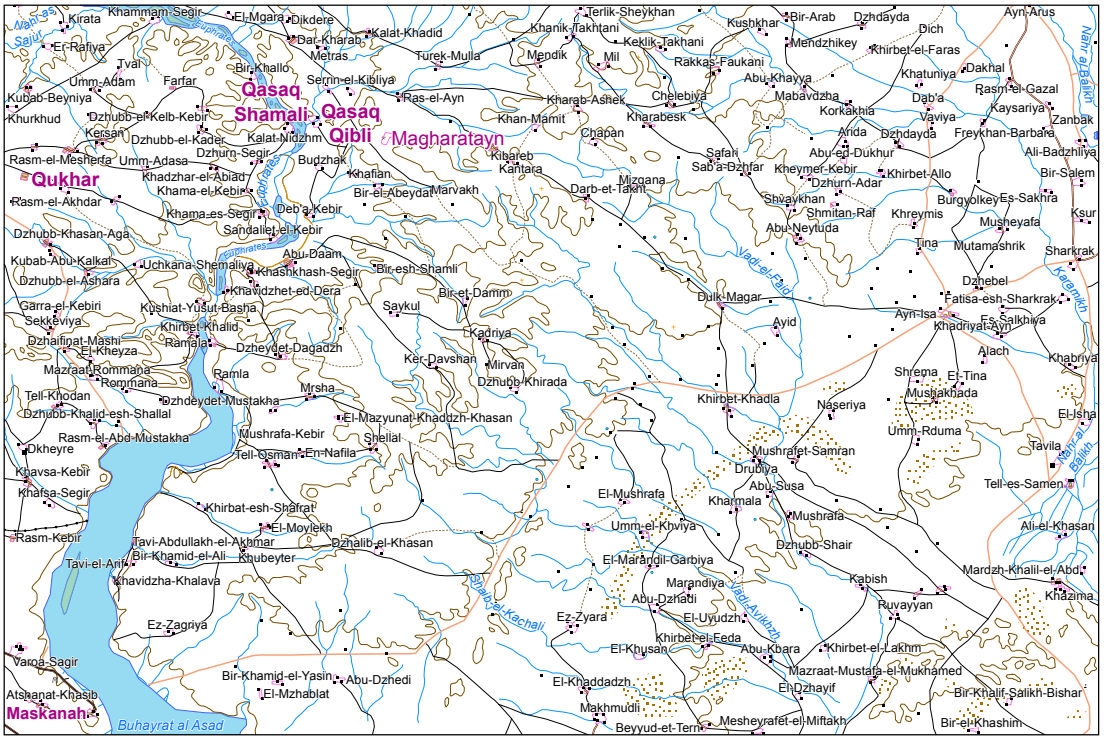
Spring (March and April) is characterized by rapidly rising heat, although occasional frosts are still possible on March nights. As in winter, precipitation is frequent (eight to 12 days with precipitation per month); rains are briefer than in winter, and sometimes accompanied by thunderstorms. The weather is variably cloudy, but April has two or three times as many clear days as cloudy ones.

Summer (May to mid-October) is hot and dry. Prevailing temperatures in the hottest months (June, July, and August) are 30–35°C (record high 46°C) in the daytime and 21–26°C at night. People moving about in daytime must be protected from possible sunstroke and heat stroke. Precipitation falls only early and late in the season (mainly in May and October), in small amounts. Drought generally lasts from June to September, when no precipitation falls at all, or if it does, it falls very rarely, no more than once per month. The summer weather is mostly clear and cloudless (25 to 30 clear days per month from June to September).

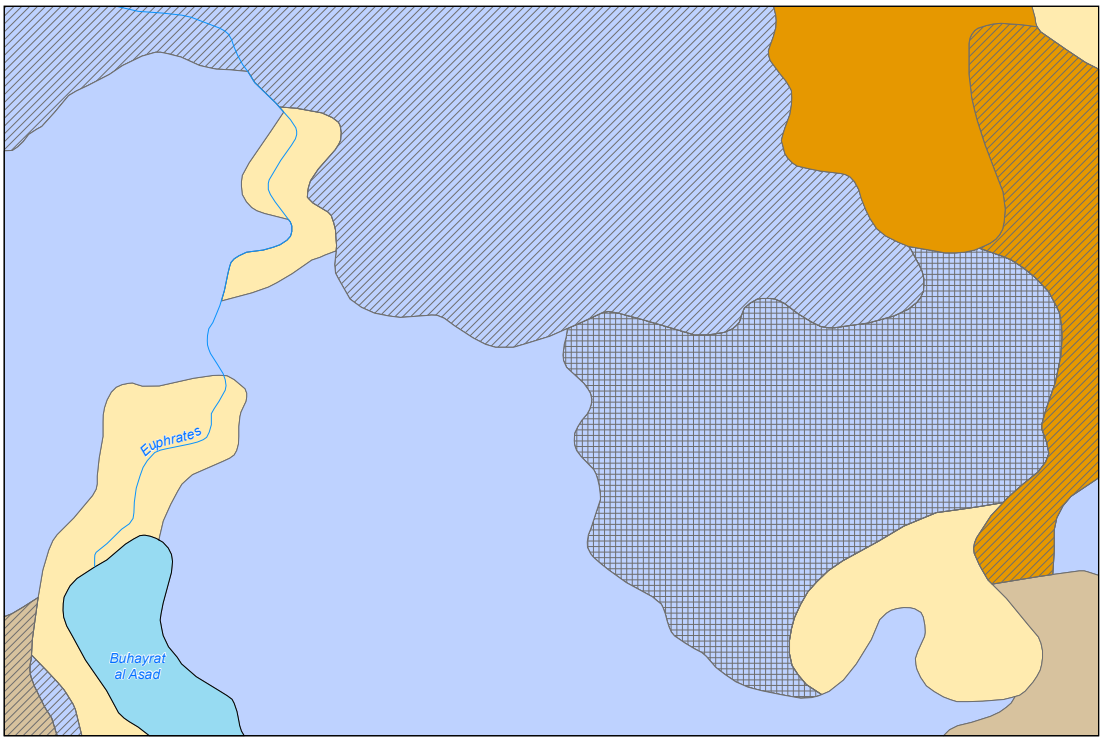
Fall (mid-October to November) is warm, but occasional night frosts occur in the second half of the season. Precipitation falls rather often (five or six days with precipitation per month), as brief rains. The weather is mostly clear (up to 13 clear days per month) or cloudless.

Winds are predominantly westerly, southwesterly, and northerly during the year; speeds are 3–5 m/s. Strong winds (up to 17 m/s) occur mainly in late winter, spring and summer, and sometimes bring dust storms. The large amounts of sand and dust raised by storms create severe conditions for movement and operations on the terrain; they sharply reduce visibility and rapidly cause engines and machinery inadequately protected from dust and sand penetration to fail. After dust storms, a haze usually persists for a long time, hindering aircraft flights and landings. The *khamsin* sometimes blows in spring and early summer; this is a strong (12–16 m/s), very dry and hot southeasterly or southerly wind that sharply lowers the relative humidity (to 10% or less), which is hard on people. The *khamsin* also often brings dust storms.

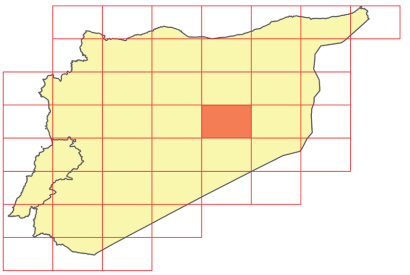
10. Maskanah (J-37-XXXIII)



Soil Map



25. FAYDAT BIN MUWAYNI`



Map Sheet Number: I-37-X

Map Sheet Coordinates: 39°E – 40°E
34°40'N – 35°20'N

Countries: Syria

Populated places and roads. The area is desert, sparsely inhabited. There are only a few rural populated places with fewer than 100 residents each; village development is asystematic and sparse, and houses are one story of adobe with flat roofs and dirt floors. The windows of houses usually look out on a courtyard enclosed by a blind wall. The traditional form of residential construction is also houses of sun-dried brick with dome- or cone-shaped roofs 4–5 meters high. In winter and spring, temporary nomadic Bedouin camps consisting of felt or woolen tents appear. Other populated places draw their water from hand-pumped wells and small cisterns called *birkets*. Hand-pumped wells are usually arranged in clusters of up to 50 wells together. Water in the wells is fresh or slightly saline, fit for drinking. Hand-pumped wells have a prevailing depth of 5–65 meters and a capacity of 30–800 liters per hour. In summer, the wells' water levels and capacities decline sharply (some dry up), and the water becomes even more saline and may become unfit for drinking. The cisterns generally contain water only during rains (from November or December to March). The highway has a 4- to 6-meter roadway. Dirt roads are negotiable by motorized vehicles year-round; during rains their passability on segments with rubbly loams with low rubble content and especially with alkali soils deteriorates.

Topography and soils. The north and west have low mountains and foothills 450–800 meters ASL, and the highest point is Mount Dabbah, 856 meters ASL. The crests of the hills are broad and rolling. The tops of the mountains and hilly ridges are flat or rounded, and the sides are predominantly gently sloping (4–6°), sometimes with rocky cliffs up to 200 meters high, dissected by temporary stream channels or wadis, which often have steep, precipitous sides (up to 6 meters high), and by gullies and ravines. The rest of the area is a gently rolling, sometimes hilly plain 250–400 meters ASL. The hills are 30–150 meters high; their tops are flat or rounded, and their sides are gently sloping, sometimes with precipitous rocky scarps up to 60 meters high and up to 10 km long, and dissected by wadi channels, gullies, and ravines. The surface of the plain is crisscrossed by gulches and wadi channels; the sides of the gulches and the banks of the wadis are generally gently sloping.

Soils are predominantly rubbly loams or rubbly-sandy loams in the mountains; loams and sandy loams with admixtures of pebbles, gravel, and boulders predominate on the plain. The soils are generally shallow (up to 3 meters thick), although they sometimes reach 30 meters in places on the plain. In the east, the loose soils are often cemented by gypsum to form a very dense hard layer or "slab" with the surface up to 2 meters thick. The loose soils are underlain by rocky and semirocky strata (limestones, marls, and gypsums) that crop out in cliffs on slopes. The ground water is predominantly slightly saline, fit or marginally fit for drinking; the water table lies 10–80 meters below the surface on the plain and in wadi channels, and 50–100 meters below the surface on the mountainsides. The area is in a zone of low seismic activity; earthquakes here have not exceeded 6 points on the Modified Mercalli Scale.

Hydrology. The area contains no rivers with permanent flows. Dry channels or wadis fill sporadically, but not every year, only during rains (mainly in winter and spring), for periods from a few hours to a few days. The salt flats are crusty, covered at the surface with a dense salt crust underlain by viscous salty soil. The crusty salt flats are usually passable when dry; the top layer of the salt flats becomes muddy during rains, making them difficult or impossible to negotiate even for pedestrians.

Vegetation is semidesert and desert, very sparse, and consists of subshrubs (sagebrush, various saltworts) and low grasses (feather grass, bluegrass, desert sedge, broom sedge), as well as lichens in rocky areas. A green grassy cover appears in winter and early spring, and burns off quickly with the onset of summer heat. Arable lands, mainly in the bottoms of gulches and wadis, are cultivated with grains and industrial crops.

Climate. The climate is subtropical continental.

Winter (December to February) is very mild. Prevailing temperatures are 9–13°C in the daytime and 4–7°C at night. Frosts are rare, occurring mainly at night (record low −9°C). Up to 50% of the annual precipitation falls in winter, predominantly as rains (five to eight days with precipitation per month); snow falls very rarely, only in some cold winters, and melts quickly. Cloudiness is variable.

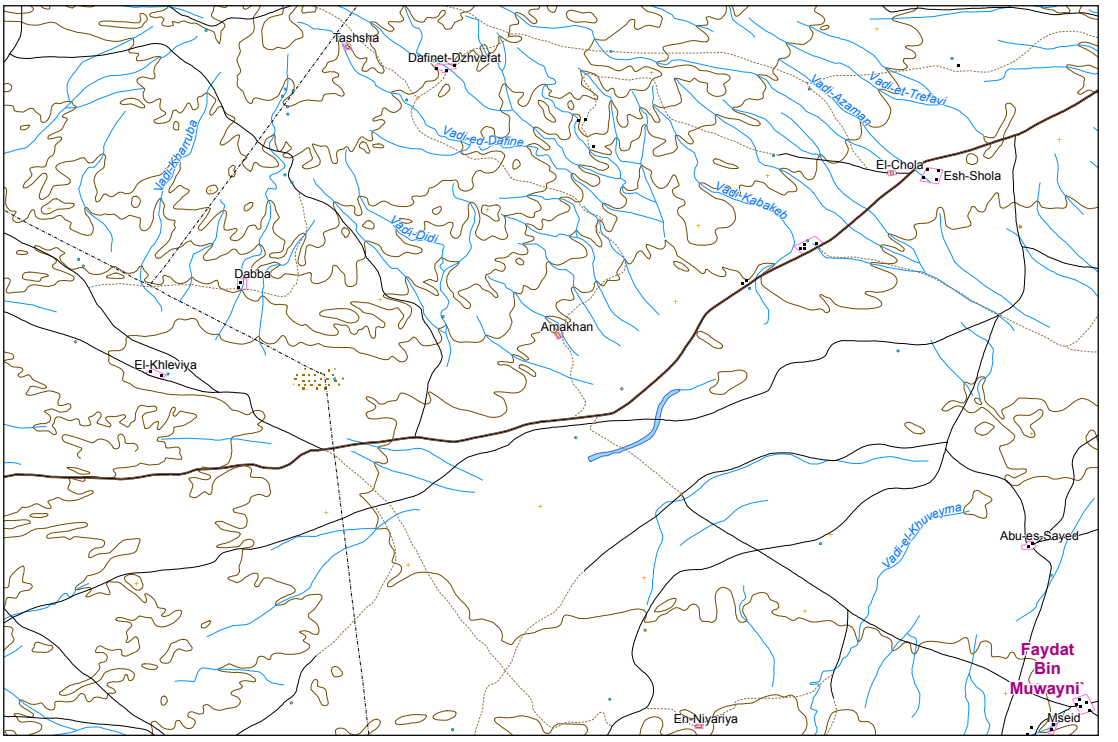
Spring (March and April) is warm. Precipitation falls as brief rains (six to eight days with precipitation per month), sometimes with thunderstorms.

Summer (May to October) is very hot and dry. Prevailing temperatures in the hottest months (June to September) are 30–36°C (record high 45°C) in the daytime and 23–27°C at night. People moving about in daytime must be afforded protection from possible sunstroke and heat stroke. Precipitation falls only early and late in the season (in May and October), rarely and in very small amounts. From June to September, generally no precipitation falls at all. The weather is clear during this season, with low relative humidity (25–35%).

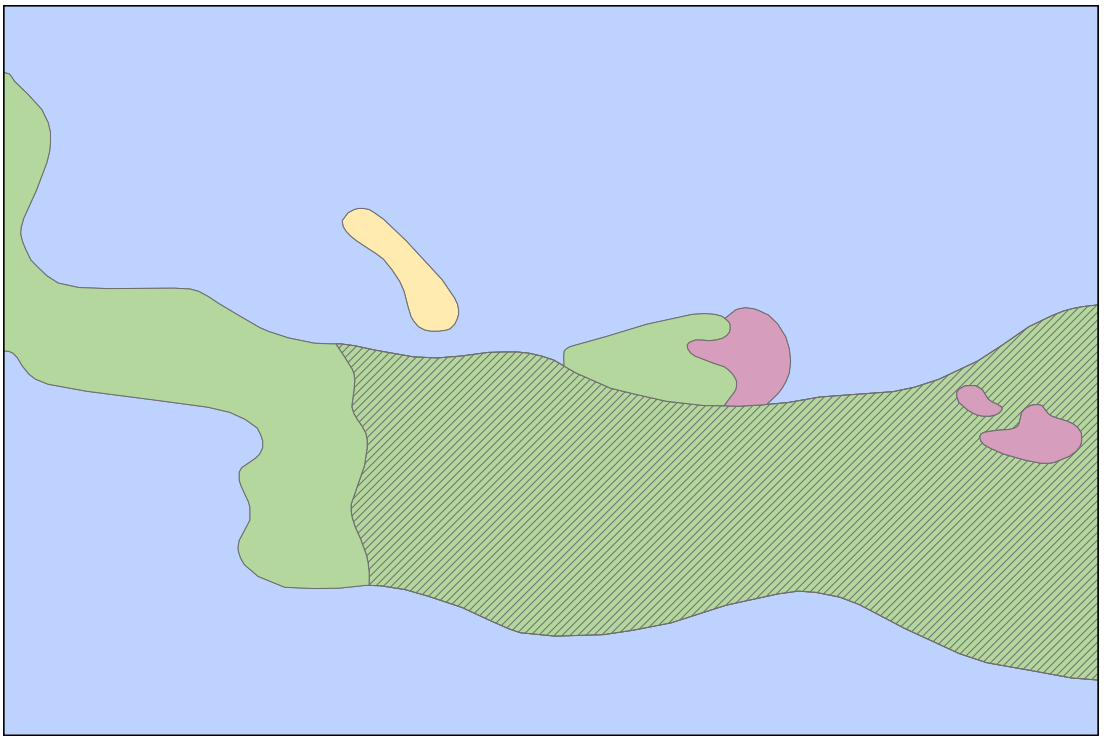
Fall (November) is warm. Precipitation falls as brief rains (three to five days with precipitation per month), sometimes with thunderstorms.

Winds are predominantly westerly and northwesterly during the year; speeds are 5–6 m/s. April and May are characterized by the *khamsin*, a strong (up to 16 m/s), very dry, and hot southeasterly wind. The *khamsin* sharply lowers the relative humidity to 10% or less, which is hard on people. The *khamsin* and other strong winds often bring dust storms, which raise large amounts of sand and dust into the air, creating severe conditions for movement and operation on the terrain. Dust storms sharply reduce visibility and rapidly cause engines and machinery inadequately protected from sand and dust penetration to fail. After dust storms, a haze usually persists for a long time, hindering aircraft flights and landings.

25. Faydat Bin Muwayni` (I-37-X)



Soil Map



Alkali soils (salt flats)

Loams and sandy loams with admixture of pebbles and gravel

Loams and sandy loams with pebble and gravel inclusions

Rubbles and loams or rubbles and sandy loams

Sands and pebbles