

Agriculture – Agricultural Patterns

Agricultural landscapes are an imprint of human activity and human culture. Different land use structures show the agricultural adjustment to the local geographical and political conditions – for a general introduction to these pages please refer to the description of Atlas p. 204/205.

Map Descriptions

Map 1: Border USA/ Canada, overview

Satellite/Sensor: Landsat ETM
Acquisition Date: 10.08.2001
Band Combination: near natural colours
Map Information: -

Map 2: Border USA- Canada

Satellite/Sensor: Landsat ETM
Acquisition Date: 10.08.2001
Band Combination: near natural colours
Map Information: -

Description: The satellite images (Maps 1 and 2) show a region along the western part of the border between USA and Canada along 49° northern latitude. Due to the differences in land use the border shows up clearly. To the south, in the US state of Montana, the quadratic wheat fields stopping abruptly at the border can be clearly recognised. The region is part of the wheat belt that stretches across the North American Plains. Due to inadequate farming methods, soil erosion is a major problem within this area. Erosion mainly occurs along the river courses. In the satellite image the badlands can be identified by their light colour. The erosion seems to be more severe in Canada than in the USA. Too many livestock could be a possible reason for the increased erosion.

Map 3: Border USA- Mexico

Satellite/Sensor: Landsat ETM
Acquisition Date: 03.05.2000
Band Combination: near natural colours
Map Information: -

Map 4: Border USA- Mexico

Satellite/Sensor: Landsat ETM
Acquisition Date: 03.05.2000
Band Combination: near natural colours
Map Information: -

Description: The satellite image maps show parts of the Imperial Valley at the border between California and Mexico. The valley is located between the Colorado River and the Salton Sea (a saline lake). The area south of the border is known as the Mexicali Valley. Although the valleys are arid and surrounded by desert, they are important agricultural areas. Due to the arid climate and low precipitation, they rely on irrigation from the All American Canal. Through a network of canals it brings water from the Colorado River in the east to the fields. The water supply, fertile soils and a long growing season allow for two crop cycles per year. Imperial Valley is one of the most productive agricultural areas in the world with alfalfa, barley, cotton, melon and citrus fruits. The Mexicali Valley has become an important exporter of asparagus, broccoli, green onion and radish. The different colours of the fields make the US-Mexican border clearly visible. A more detailed view of the border

between USA and Mexico is given in Map 4, which also highlights differences in the organisation of the fields north and south of the border.

Map 5: Agriculture in the Argentinian Pampas

Satellite/Sensor: Landsat TM
Acquisition Date: 28.03.2000
Band Combination: near natural colours
Map Information: -

Map 6: Field structures in the Argentinian Pampas

Satellite/Sensor: Landsat TM
Acquisition Date: 28.03.2000
Band Combination: near natural colours
Map Information: -

Description: Maps 5 and 6 show a part of the humid pampas, the main agricultural region of Argentina. In comparison with other agricultural regions the enormous size of the areas becomes obvious. The quadrangular patterns of the fields can be easily recognised. Within this region wheat and soy beans are the leading crops, accompanied by cattle grazing. As the green colour indicates, many of the fields are not harvested yet. The region is only sparsely populated, General Villegas being the largest town in the area covered by the satellite image. Between the fields numerous lakes can be seen.

Map 7: Agriculture at Costa del Sol, south coast of Spain

Satellite/Sensor: Landsat ETM
Acquisition Date: 25.04.2000
Band Combination: near natural colours
Map Information: -

Map 8: Greenhouses, Spain

Satellite/Sensor: Landsat ETM
Acquisition Date: 25.04.2000
Band Combination: near natural colours
Map Information: -

Description: Maps 7 and 8 show the province of Almería in southern Spain with thousands of closely packed plastic greenhouses. They extend from the shoreline right up to the base of the mountains. The area of plastic houses is estimated at 40,000 ha and forms the largest concentration of greenhouses in the world. Most producers are family companies with areas of about 1 to 1.5 ha. Mainly vegetables (tomatoes) are grown in an artificial sandy soil. Over the past decades, the small coastal plain has been intensively developed for agriculture. The area has a dry, mild, Mediterranean climate and is further sheltered on the north by the Sierra de Gador mountains. With just slightly more than 200 mm of annual precipitation, the agriculture in that area relies on groundwater.

Map 9: Al Kufra oasis, Libya, with irrigated fields

Satellite/Sensor: QuickBird
Acquisition Date: 29.07.2003
Band Combination: near natural colours
Map Information: -

Map 10: Detail of Al Kufra oasis

Satellite/Sensor: QuickBird
Acquisition Date: 29.07.2003
Band Combination: near natural colours
Map Information: -

Description: The two satellite images (Maps 9 and 10) show the hexagonal agricultural patterns of the Al Kufra Oasis in south-eastern Libya. The irrigation system uses groundwater that is pumped under pressure into the centre of each hexagon. The buildings are concentrated around the inner core with the well. Along the outline of each structure a vegetated strip helps to protect the fields against wind erosion and sand accumulation. The field structures as well as farm buildings are visible within the hexagons. As the maps show, some of the areas are not yet fully used.

The Sahara Desert makes up most of Libya, with only 6% of the country's land suitable for farming. With no permanent rivers or bodies of water, agriculture in Libya is only possible by using fossil groundwater for irrigation.

Map 11: Terraces, Saudi Arabia, Asir Mountains

Satellite/Sensor: IKONOS
Acquisition Date: 07.10.2000
Band Combination: panchromatic
Map Information: -

Map 12: Terraces in different elevation levels

Satellite/Sensor: background IKONOS
Acquisition Date: 07.10.2000
Band Combination: panchromatic
Map Information: agricultural land

Description: The satellite image map shows an area in the Asir Mountains in Saudi Arabia. The Asir region is situated on a high plateau that receives more rainfall than the rest of the country. Although the relevant data is inadequate, the average annual rainfall in the highlands probably ranges from 300 to 500 mm.

In this region, the tradition of high-mountain agriculture is about two thousand years old. It has produced a terraced landscape on the steep mountain slopes. However, this farming practice has eliminated much of the forest and woodland cover, of which only scattered patches have survived. The maps show how the terraces follow the topography of the terrain. Mainly wheat and fruit are grown on the terraces.

Map 13: Rice terraces in Bali

Satellite/Sensor: QuickBird
Acquisition Date: 26.05.2002
Band Combination: near natural colours
Map Information: -

Map 14: Agricultural patterns in Bali

Satellite/Sensor: QuickBird
Acquisition Date: 26.05.2002
Band Combination: near natural colours
Map Information: -

Description: Indonesia is one of the world's leading rice producers, with an annual production of more than 50 million tonnes (2003) and a cultivated area of more than 11,5 million ha. Rice is grown at varying altitudes, with about 75% of plantings in irrigated areas and less than 10% on rainfed lowlands. Map 13 shows rice terraces on Bali, an Indonesian island. The Balinese rice terraces have a long history, dating back over 2000 years. They have made steep hillsides usable for rice cultivation. Bali has a tropical climate with temperatures around 27°C throughout the year and a rainy season from October to April. Since the temperature is stable and rice plants can be cultivated anytime, double or even triple cropping is possible. Because of this, the landscape alternates between fields that are harvested, fields planted with green rice plants, and fields where rice seedlings have been transplanted, which can be clearly seen in the satellite image. Between the paddy fields strips of rainforest are visible.

Map 14 gives an impression of the importance of agriculture in Bali. The entire area in the map is used for agriculture, the only exceptions being vegetation along watercourses and settlements along the roads, which show up in a reddish colour.

Map 15: Agricultural patterns in Kalimantan

Satellite/Sensor: QuickBird
Acquisition Date: 04.04.2004
Band Combination: near natural colours
Map Information: -

Map 16: Agricultural patterns in Kalimantan

Satellite/Sensor: QuickBird
Acquisition Date: 04.04.2004
Band Combination: near natural colours
Map Information: -

Description: The satellite image maps show oil palm plantations in Kalimantan, the Indonesian part of the island of Borneo. The large monoculture of oil palms, which are used both for food and energy production, shows different growing stages. In the west of the image trees of younger age can be recognised, whereas in the east the oldest palms are growing. Recently deforested areas can be seen in the north. As Map 16 shows, the plantations are located in the vicinity of mangroves, which grow along the sea coast. As the plantations expand, mangroves are logged in order to gain new agricultural areas. Large areas of rainforest are being removed in order to expand the plantations, which threatens the indigenous people as well as the biodiversity of the region, represented e.g. by the Orang Utan.