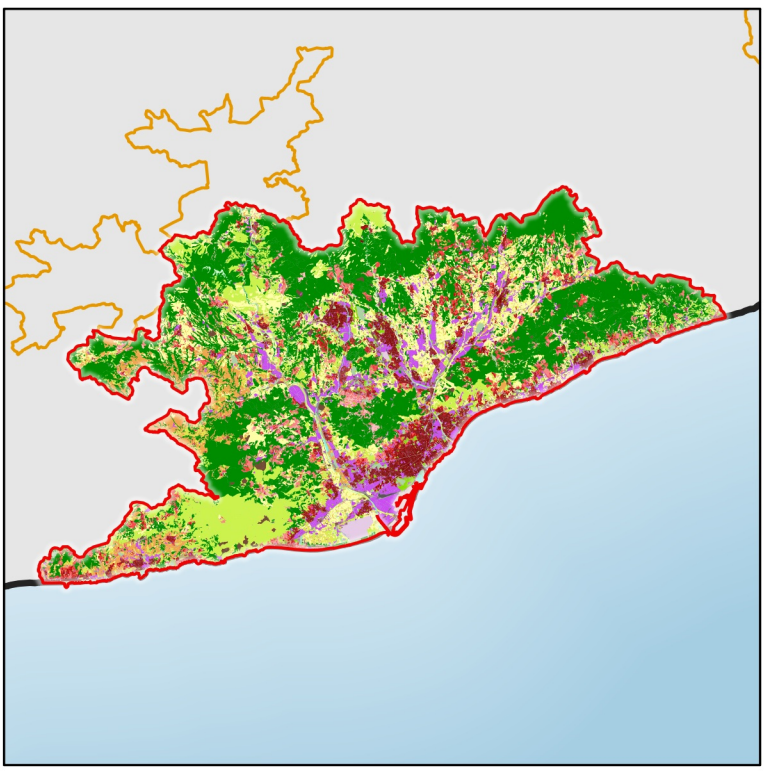
Urban Atlas 2018
LU/LC Product Delivery Report

ES002L2 - Barcelona

Country	City	FUA Area (sqkm)
Spain	Barcelona	2646.05
Delivered files		
UA2018 and UA2012 Revised LU/LC layers in Geopackage format 2012-2018 LU/LC change layer in Geopackage format INSPIRE-compliant metadata in XML format for all layers UA2018 LC/LU map		
Projection	**Geographic Bounding Box (in WGS84)**	
EPSG: 3035 ETRS89 / LAEA Europe	41.76° 1.56° 2.67° 41.19°	



Nomenclature

- 11100: Continuous urban fabric (S.L.: > 80%)
- 11210: Discontinuous dense urban fabric (S.L.: 50% - 80%)
- 11220: Discontinuous medium density urban fabric (S.L.: 30% - 50%)
- 11230: Discontinuous low density urban fabric (S.L.: 10% - 30%)
- 11240: Discontinuous very low density urban fabric (S.L.: < 10%)
- 11300: Isolated structures
- 12100: Industrial, commercial, public, military and private units
- 12210: Fast transit roads and associated land
- 12220: Other roads and associated land
- 12230: Railways and associated land
- 12300: Port areas
- 12400: Airports
- 13100: Mineral extraction and dump sites
- 13300: Construction sites
- 13400: Land without current use
- 14100: Green urban areas
- 14200: Sports and leisure facilities
- 21000: Arable land (annual crops)
- 22000: Permanent crops
- 23000: Pastures
- 24000: Complex and mixed cultivation patterns
- 25000: Orchards at the fringe of urban classes
- 31000: Forests
- 32000: Herbaceous vegetation associations
- 33000: Open spaces with little or no vegetation
- 40000: Wetlands
- 50000: Water

Input data

Satellite imagery data

Sensor	Image Date	Filename	Cloud Coverage	Spatial Resolution
Pleiades1B	2018-08-11	PH1B_PHR_MS___3_20180811T105045_20180811T105050_TOU_1234_5641.DIMA	0.62%	2 m
Pleiades1B	2018-08-11	PH1B_PHR_MS___3_20180811T105033_20180811T105038_TOU_1234_f1eb.DIMA	6.94%	2 m
SPOT-6	2018-08-06	SP06_NAO_MS4__3_20180806T101237_20180806T101243_TOU_1234_34fd.DIMA	0%	4 m
Superview-1	2018-08-05	SW00_OPT_MS4_1C_20180805T111300_20180805T111302_TOU_1234_54a8.DIMA	0%	2 m
PlanetScope	2018-08-01	PL00_DOV_MS_L3A_20180801T095950_20180801T095950_TOU_1234_c329.DIMA	0%	4 m
PlanetScope	2018-08-01	PL00_DOV_MS_L3A_20180801T095949_20180801T095949_TOU_1234_2443.DIMA	0%	4 m
PlanetScope	2018-08-01	PL00_DOV_MS_L3A_20180801T095948_20180801T095948_TOU_1234_909f.DIMA	0%	4 m
PlanetScope	2018-08-01	PL00_DOV_MS_L3A_20180801T095947_20180801T095947_TOU_1234_a621.DIMA	0%	4 m
PlanetScope	2018-07-30	PL00_DOV_MS_L3A_20180730T101313_20180730T101313_TOU_1234_e7d7.DIMA	0%	4 m
PlanetScope	2018-07-30	PL00_DOV_MS_L3A_20180730T101312_20180730T101312_TOU_1234_2b33.DIMA	0%	4 m
PlanetScope	2018-07-29	PL00_DOV_MS_L3A_20180729T100957_20180729T100957_TOU_1234_a6f4.DIMA	0%	4 m
Pleiades1B	2018-07-23	PH1B_PHR_MS___3_20180723T104641_20180723T104644_TOU_1234_7331.DIMA	0.25%	2 m
PlanetScope	2018-07-20	PL00_DOV_MS_L3A_20180720T100857_20180720T100857_TOU_1234_72d5.DIMA	0%	4 m
SPOT-7	2018-07-12	SP07_NAO_MS4__3_20180712T100534_20180712T100543_TOU_1234_424d.DIMA	0%	4 m
SPOT-7	2018-07-12	SP07_NAO_MS4__3_20180712T100534_20180712T100543_TOU_1234_415c.DIMA	0%	4 m
Superview-1	2018-07-06	SW00_OPT_MS4_1C_20180706T104847_20180706T104849_TOU_1234_da1f.DIMA	11.68%	2 m
Superview-1	2018-07-06	SW00_OPT_MS4_1C_20180706T104845_20180706T104847_TOU_1234_7819.DIMA	0%	2 m
Superview-1	2018-07-06	SW00_OPT_MS4_1C_20180706T110755_20180706T110757_TOU_1234_4b9c.DIMA	0.5%	2 m
Superview-1	2018-07-06	SW00_OPT_MS4_1C_20180706T104843_20180706T104845_TOU_1234_3250.DIMA	0%	2 m
Superview-1	2018-07-06	SW00_OPT_MS4_1C_20180706T104841_20180706T104844_TOU_1234_b8f2.DIMA	0%	2 m
Superview-1	2018-07-06	SW00_OPT_MS4_1C_20180706T104849_20180706T104851_TOU_1234_5092.DIMA	0%	2 m
Superview-1	2018-07-06	SW00_OPT_MS4_1C_20180706T110757_20180706T110759_TOU_1234_a1d8.DIMA	0%	2 m
SPOT-6	2018-07-04	SP06_NAO_MS4__3_20180704T101656_20180704T101704_TOU_1234_4eec.DIMA	0%	4 m
SPOT-6	2018-07-04	SP06_NAO_MS4__3_20180704T101656_20180704T101704_TOU_1234_4dd9.DIMA	0%	4 m
SPOT-6	2018-07-04	SP06_NAO_MS4__3_20180704T101656_20180704T101704_TOU_1234_4cdb.DIMA	0%	4 m
SPOT-6	2018-07-04	SP06_NAO_MS4__3_20180704T101656_20180704T101704_TOU_1234_4ba7.DIMA	0%	4 m
SPOT-6	2018-07-04	SP06_NAO_MS4__3_20180704T101629_20180704T101638_TOU_1234_3de9.DIMA	0%	4 m
Pleiades1B	2018-07-04	PH1B_PHR_MS___3_20180704T104244_20180704T104247_TOU_1234_46ee.DIMA	0%	2 m
SPOT-6	2018-06-22	SP06_NAO_MS4__3_20180622T100911_20180622T100919_TOU_1234_3853.DIMA	0%	4 m
SPOT-6	2018-06-22	SP06_NAO_MS4__3_20180622T100911_20180622T100919_TOU_1234_377c.DIMA	0%	4 m
SPOT-6	2018-06-22	SP06_NAO_MS4__3_20180622T100911_20180622T100919_TOU_1234_36a6.DIMA	0%	4 m
PlanetScope	2018-06-22	PL00_DOV_MS_L3A_20180622T100922_20180622T100922_TOU_1234_c013.DIMA	0%	4 m
PlanetScope	2018-06-22	PL00_DOV_MS_L3A_20180622T100921_20180622T100921_TOU_1234_bd41.DIMA	0%	4 m
PlanetScope	2018-06-22	PL00_DOV_MS_L3A_20180622T100920_20180622T100920_TOU_1234_0af7.DIMA	0%	4 m
PlanetScope	2018-06-22	PL00_DOV_MS_L3A_20180622T100919_20180622T100919_TOU_1234_fe5d.DIMA	0%	4 m
PlanetScope	2018-06-20	PL00_DOV_MS_L3A_20180620T100757_20180620T100757_TOU_1234_551e.DIMA	0%	4 m
PlanetScope	2018-06-20	PL00_DOV_MS_L3A_20180620T100758_20180620T100758_TOU_1234_0891.DIMA	0%	4 m
Pleiades1B	2018-06-20	PH1B_PHR_MS___3_20180620T105019_20180620T105024_TOU_1234_56fb.DIMA	0%	2 m
PlanetScope	2018-06-20	PL00_DOV_MS_L3A_20180620T100917_20180620T100917_TOU_1234_f34e.DIMA	0%	4 m

PlanetScope	2018-06-20	PL00_DOV_MS_L3A_20180620T100915_20180620T100915_TOU_1234_6e7c.DIMA	0%	4 m
PlanetScope	2018-06-20	PL00_DOV_MS_L3A_20180620T100914_20180620T100914_TOU_1234_e8a8.DIMA	0%	4 m
PlanetScope	2018-06-20	PL00_DOV_MS_L3A_20180620T100759_20180620T100759_TOU_1234_2760.DIMA	0%	4 m
SPOT-7	2018-06-19	SP07_NAO_MS4__3_20180619T103252_20180619T103256_TOU_1234_43fd.DIMA	0%	4 m
PlanetScope	2018-06-18	PL00_DOV_MS_L3A_20180618T101019_20180618T101019_TOU_1234_a153.DIMA	0%	4 m
PlanetScope	2018-06-18	PL00_DOV_MS_L3A_20180618T101016_20180618T101016_TOU_1234_058f.DIMA	0%	4 m
PlanetScope	2018-06-18	PL00_DOV_MS_L3A_20180618T101018_20180618T101018_TOU_1234_13d1.DIMA	0%	4 m
PlanetScope	2018-06-18	PL00_DOV_MS_L3A_20180618T101017_20180618T101017_TOU_1234_04be.DIMA	0%	4 m
PlanetScope	2018-06-18	PL00_DOV_MS_L3A_20180618T101019_20180618T101019_TOU_1234_a088.DIMA	0%	4 m
Pleiades1B	2018-06-18	PH1B_PHR_MS___3_20180618T110422_20180618T110435_TOU_1234_619c.DIMA	5.13%	2 m
Pleiades1B	2018-06-18	PH1B_PHR_MS___3_20180618T110457_20180618T110512_TOU_1234_638b.DIMA	0%	2 m
Pleiades1A	2018-06-14	PH1A_PHR_MS___3_20180614T104647_20180614T104652_TOU_1234_c5de.DIMA	0%	2 m
Superview-1	2018-06-13	SW00_OPT_MS4_1C_20180613T105002_20180613T105004_TOU_1234_4f02.DIMA	0%	2 m
Superview-1	2018-06-13	SW00_OPT_MS4_1C_20180613T105001_20180613T105003_TOU_1234_182d.DIMA	2.2%	2 m
Pleiades1B	2017-07-31	PH1B_PHR_MS___3_20170731T104311_20170731T104314_TOU_1234_a3d5.DIMA	0%	2 m
Pleiades1B	2017-07-12	PH1B_PHR_MS___3_20170712T103922_20170712T103925_TOU_1234_a5ea.DIMA	0%	2 m
Superview-1	2017-07-03	SW00_OPT_MS4_1C_20170703T105650_20170703T105653_TOU_1234_bb39.DIMA	0%	2 m
Superview-1	2017-07-03	SW00_OPT_MS4_1C_20170703T105648_20170703T105650_TOU_1234_8ac1.DIMA	0%	2 m
Superview-1	2017-07-03	SW00_OPT_MS4_1C_20170703T105647_20170703T105649_TOU_1234_375e.DIMA	0%	2 m
Pleiades1A	2017-05-27	PH1A_PHR_MS___3_20170527T104231_20170527T104234_TOU_1234_5c7a.DIMA	0%	2 m

Methodology

1. Access and preparation of input Earth Observation satellite data, both VHR imagery 2018 and Sentinel-2, made available through ESA CSCDA mechanism.

2. LU/LC change detection over the period 2012-2018 in non-artificial areas at level 1 of the nomenclature by means of supervised machine learning techniques for automatic classification based on Copernicus Sentinel-2 time series (2018).

3. LU/LC change detection over the period 2012-2018 in artificial areas, and visual check, geometric refinement and thematic characterisation of changes in non-artificial areas by means of visual comparison of the reference core datasets of satellite imagery VHR2012 and VHR2018. In addition, the main ancillary data sources used are Google Earth and Wikimapia.

4. Quality Assurance / Quality Check (QAQC) by means of automatic GIS triggers and tools, and visual interpretation.

5. Thematic accuracy assessment based on stratified random sampling approach and reference dataset produced by IGNFI.

Production Team

2018 Image Analysis

Analyst name	Start Date	End Date
Aurore Place	2019-09-20	2019-10-04
Mathilde Steinauer	2019-10-21	2019-10-21
Thomas Vauthier	2019-12-13	2019-12-13
Anthony Piron	2019-12-16	2019-12-16

Internal Quality Control

Name	Date
Anthony Piron	2019-12-19

Quality Assessment

Name	Date
IGNFI	2020-02-21

Delivery Clearance

Date
2020-02-07

Thematic Accuracy Assessment - Results

	Overall accuracy	95% Confidence Interval
Urban Classes	91.37%	1.9%
Rural Classes	84.54%	2.4%
Overall Area	80.45%	2.7%

Basic Statistics - LULC classification at level 1

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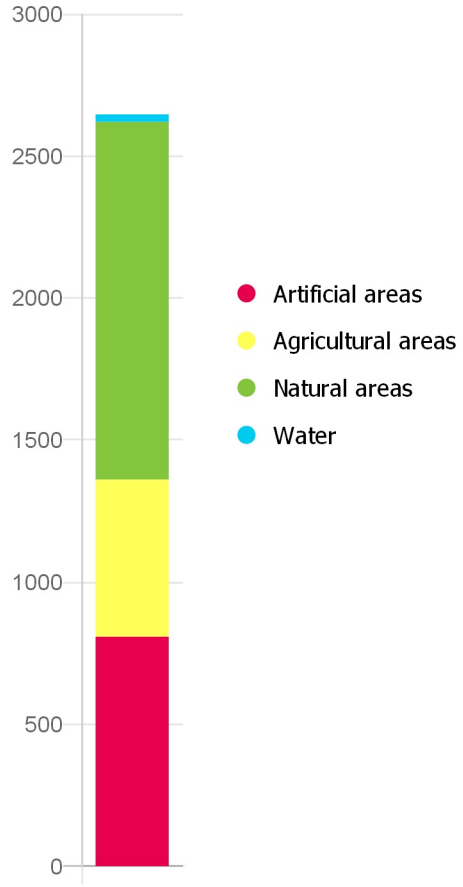
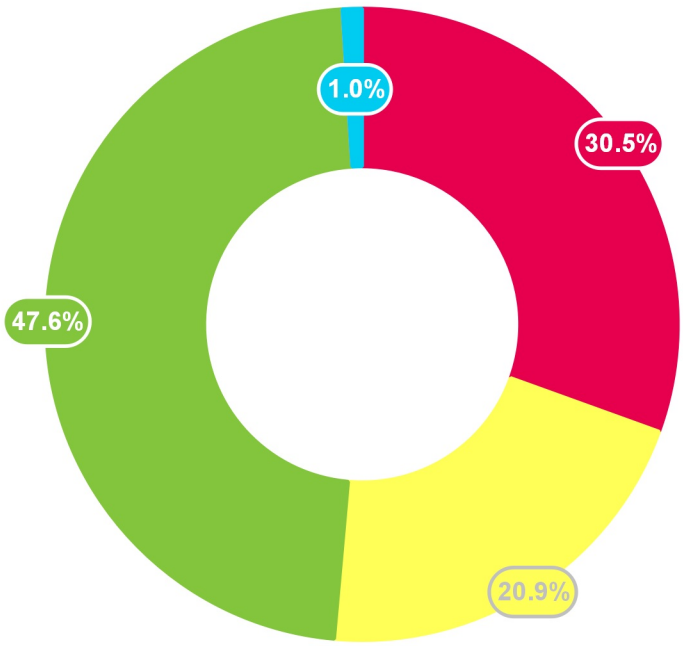
Urban Atlas 2018 LULC distribution (in sqkm)



- Artificial areas
- Agricultural areas
- Natural areas
- Water



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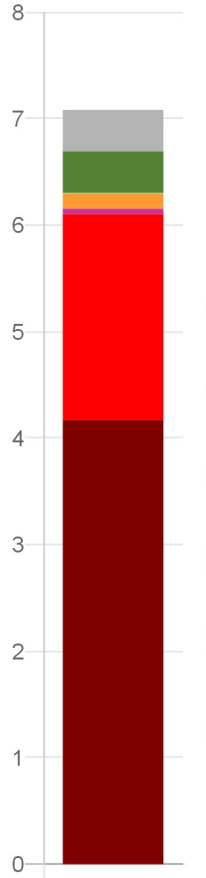
Main changes between Urban Atlas 2012 and Urban Atlas 2018 (in sqkm)



- Urban expansion: uptake of agricultural areas
- Urban expansion: uptake of natural areas
- Urban expansion: uptake of wetland/water
- Agriculture development: uptake of natural areas
- Natural area expansion: uptake of agriculture
- Loss of artificial areas
- Other changes