



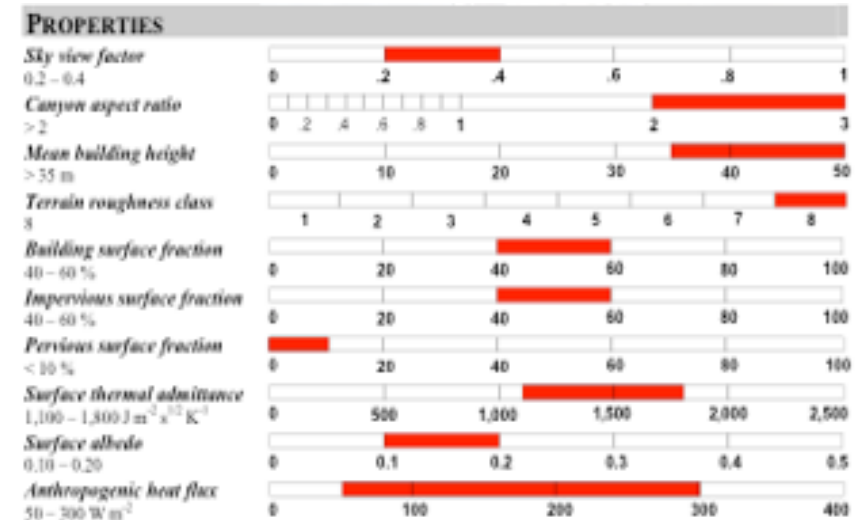
Generating WUDAPT's Specific Scale-dependent Urban Modelling and Activity Parameters: Collection of Level 1 and Level 2 Data

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Context

- The need for WUDAPT
- Local Climate Zones (LCZs)
 - Appropriate scheme
 - Range for UCPs
 - Workflow for creation
 - Workshop on Wed
- Levels of data collection



Levels of Data Collection

- Level 0 – LCZ mapping
- Level 1 – Sampling to refine parameter ranges, e.g. sky view factor ranges between 0.2 and 0.4 for LCZ1
- Level 2 – Wall-to-wall approaches

➔ Need standardized methods and protocols

➔ Need data collection tools + experts

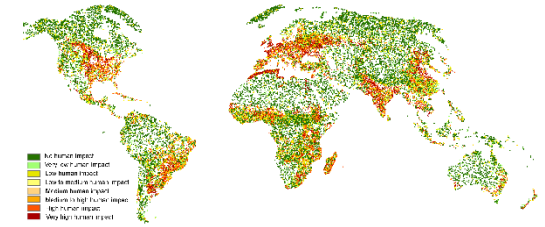
Information Needed on Urban Form and Function

Feature	Variable
Cover	Land cover, vegetation type, vegetation organization
Geometry	Building height, width of streets, contiguous or isolated buildings, roof geometry
Material	Wall type, roof type, window type, road materials, window fraction on the wall, colour/albedo
Function	Building use, irrigation, road type, temperature settings, occupancy, air conditioning, shutters or shading, window opening, building age, building renovation post 1990

Visualization of Global Land Cover, Biomass, Photos, etc.



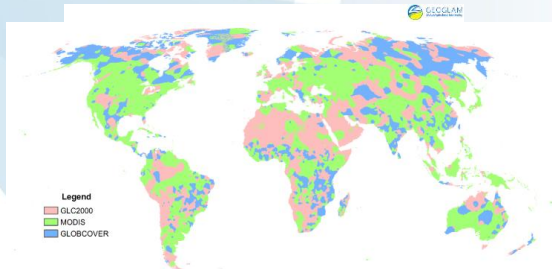
Crowdsourcing of Land Cover (Google Earth, Bing Maps)



Geo-Wiki



Creation of Hybrid Land Cover Maps



Validation of Land Cover Maps



In-situ Data via Geo-Wiki Pictures app



Serious Games (Cropland Capture)



Cities Geo-Wiki

GEO-Wiki CITIES

Cities (dev) Homepage geolms Logout

Don't show any overlays

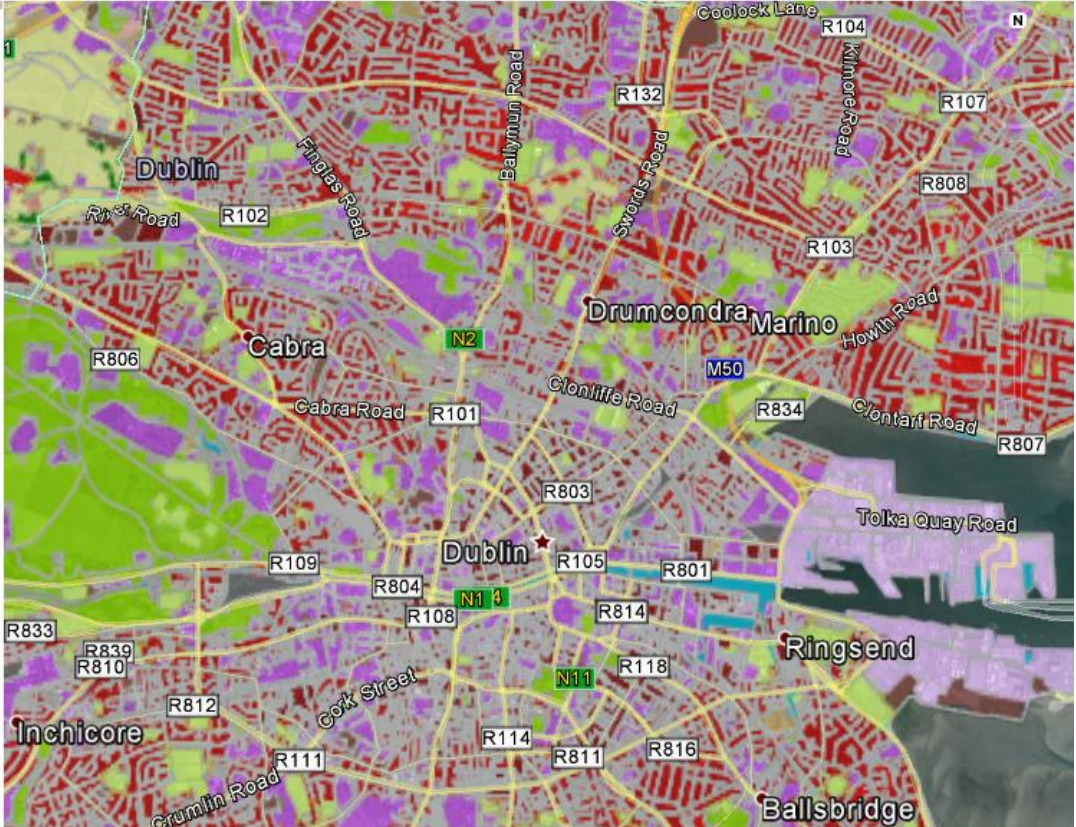
Dublin

- Dublin Urban Atlas
- Dublin Building Footprints
- Dublin LCZ

[Start validation](#)

- [Hamburg](#)
- [Houston](#)
- [Sao Paulo](#)
- [Medellin](#)
- [Kuala Lumpur](#)
- [Additional Data](#)
- [Geocoding](#)

- Continuous Urban Fabric (S.L. > 80%)
- Discontinuous Dense Urban Fabric (S.L. : 50% - 80%)
- Discontinuous Medium Density Urban Fabric (S.L. : 30% - 50%)
- Discontinuous Low Density Urban Fabric (S.L. : 10% - 30%)
- Discontinuous Very Low Density Urban Fabric (S.L. < 10%)
- Isolated Structures
- Industrial, commercial, public, military and private units
- Fast transit roads and associated land
- Other roads and associated land
- Railways and associated land
- Port areas
- Airports
- Mineral extraction and dump sites
- Construction sites
- Land without current use
- Green urban areas
- Sports and leisure facilities
- Agricultural + Semi-natural areas + Wetlands
- Forests
- Wetlands
- Water bodies



The map displays the Dublin region with various urban fabric types and road networks. Key areas labeled include Dublin, Cabra, Drumcondra, Marino, Ringsend, Ballsbridge, and Inchicore. Major roads shown include R101, R102, R103, R104, R105, R106, R107, R108, R109, R110, R111, R112, R113, R114, R115, R116, R117, R118, R119, R120, R121, R122, R123, R124, R125, R126, R127, R128, R129, R130, R131, R132, R133, R134, R135, R136, R137, R138, R139, R140, R141, R142, R143, R144, R145, R146, R147, R148, R149, R150, R151, R152, R153, R154, R155, R156, R157, R158, R159, R160, R161, R162, R163, R164, R165, R166, R167, R168, R169, R170, R171, R172, R173, R174, R175, R176, R177, R178, R179, R180, R181, R182, R183, R184, R185, R186, R187, R188, R189, R190, R191, R192, R193, R194, R195, R196, R197, R198, R199, R200, R201, R202, R203, R204, R205, R206, R207, R208, R209, R210, R211, R212, R213, R214, R215, R216, R217, R218, R219, R220, R221, R222, R223, R224, R225, R226, R227, R228, R229, R230, R231, R232, R233, R234, R235, R236, R237, R238, R239, R240, R241, R242, R243, R244, R245, R246, R247, R248, R249, R250, R251, R252, R253, R254, R255, R256, R257, R258, R259, R260, R261, R262, 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R927, R928, R929, R930, R931, R932, R933, R934, R935, R936, R937, R938, R939, R940, R941, R942, R943, R944, R945, R946, R947, R948, R949, R950, R951, R952, R953, R954, R955, R956, R957, R958, R959, R960, R961, R962, R963, R964, R965, R966, R967, R968, R969, R970, R971, R972, R973, R974, R975, R976, R977, R978, R979, R980, R981, R982, R983, R984, R985, R986, R987, R988, R989, R990, R991, R992, R993, R994, R995, R996, R997, R998, R999, R1000.

Validating the LCZ Map

The screenshot shows the GEO-Wiki CITIES web application interface. At the top left is the GEO-Wiki logo and the word "CITIES". Below it is a dropdown menu showing "Cities (dev)". On the right side of the top bar are links for "Homepage", "geolms", and "Logout".

The main interface is divided into three main sections:

- Left Panel:** Contains a zoom slider, navigation icons (arrow, camera), and a "Don't show any overlays" checkbox. Below this is a dropdown menu for "Dublin" with radio buttons for "Dublin Urban Atlas", "Dublin Building Footprints", and "Dublin LCZ". There are "Start validation" and "Stop" buttons. A list of other cities is shown with expandable arrows: Hamburg, Houston, Sao Paulo, Medellin, Kuala Lumpur, Additional Data, and Geocoding.
- Center Panel:** An aerial satellite map of a city street grid. A red rectangular box highlights a specific area in the center of the map, bounded by streets including Belvidere Road, Portland Place, and R101.
- Right Panel:** Features tabs for "LC", "Pics", "OSM", and "LCZ". Below the tabs is the heading "LCZ validation:". Underneath, it says "Select a building type:" followed by a grid of 10 3D building icons representing different urban forms. Below that, it says "or select a landcover type:" followed by a grid of 7 flat landcover icons representing different ground surfaces.

At the bottom right of the interface is a "Submit:" label and a "Submit validation" button.

Level 1: Sampling Across LCZs

Cities (dev)

Homepage

geolms

Logout



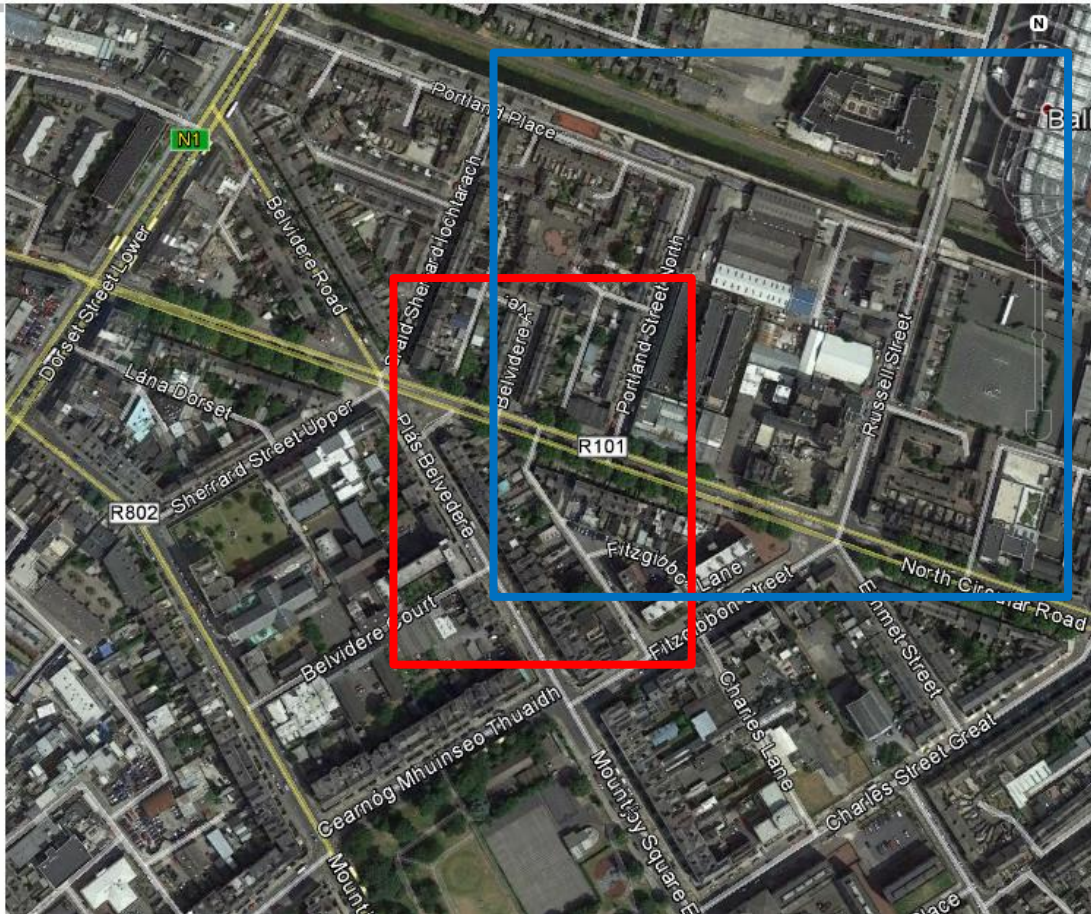
Don't show any overlays

Dublin

- Dublin Urban Atlas
- Dublin Building Footprints
- Dublin LCZ

Start validation Stop

- Hamburg
- Houston
- Sao Paulo
- Medellin
- Kuala Lumpur
- Additional Data
- Geocoding



LC Pics OSM LCZ

Validate the polygon:

- Buildings: 50 %
- Impervious surface: 50 %
- Unmanaged surface: 50 %
- Coniferous trees: 50 %
- Deciduous trees: 50 %
- Pervious surface: 50 %
- Water surface: 50 %

TOTAL: 350 %

Comment:

Google Image Date:

Submit:

Submit validation

Level 1: Point sampling

- Sampling at a regular spaced grid across Dublin using Geo-Wiki - completed
- Allows you to create % land cover types for any type of grid size
- Need to determine the optimal spacing & sensitivity of model results
- Experimenting with OSM to reduce sampling



Information Needed on Urban Form and Function – Level 1

Feature	Variable
Cover	Land cover, vegetation type, vegetation organization
Geometry	Building height , width of streets, contiguous or isolated buildings, roof geometry
Material	Wall type, roof type , window type, road materials, window fraction on the wall, colour/albedo
Function	Building use, irrigation, road type, temperature settings, occupancy, air conditioning, shutters or shading, window opening, building age , building renovation post 1990

Using Pictures to Extract Data

The screenshot displays the GEO-Wiki Cities web application. At the top left is the GEO-Wiki logo and the word "CITIES". Below this is a search bar containing "Cities (dev)" and navigation buttons for "Homepage", "geolms", and "Logout". The main content area features a street view image of a residential street with brick houses and a blue sky with white clouds. To the right of the image is a classification form with tabs for "LC", "Pics", "OSM", and "LCZ". The form includes the following fields and options:

- Classify the photos:**
- Photo 1 of 5
- Building height:
- Building material:
- Roof material:
- Roof type:
- Submit:

On the left side of the interface, there is a sidebar with a "Don't show" button and a list of cities including Dublin, Hamburg, Houston, Sao Paulo, Medellin, Kuala Lumpur, and additional options for adding and geocoding.

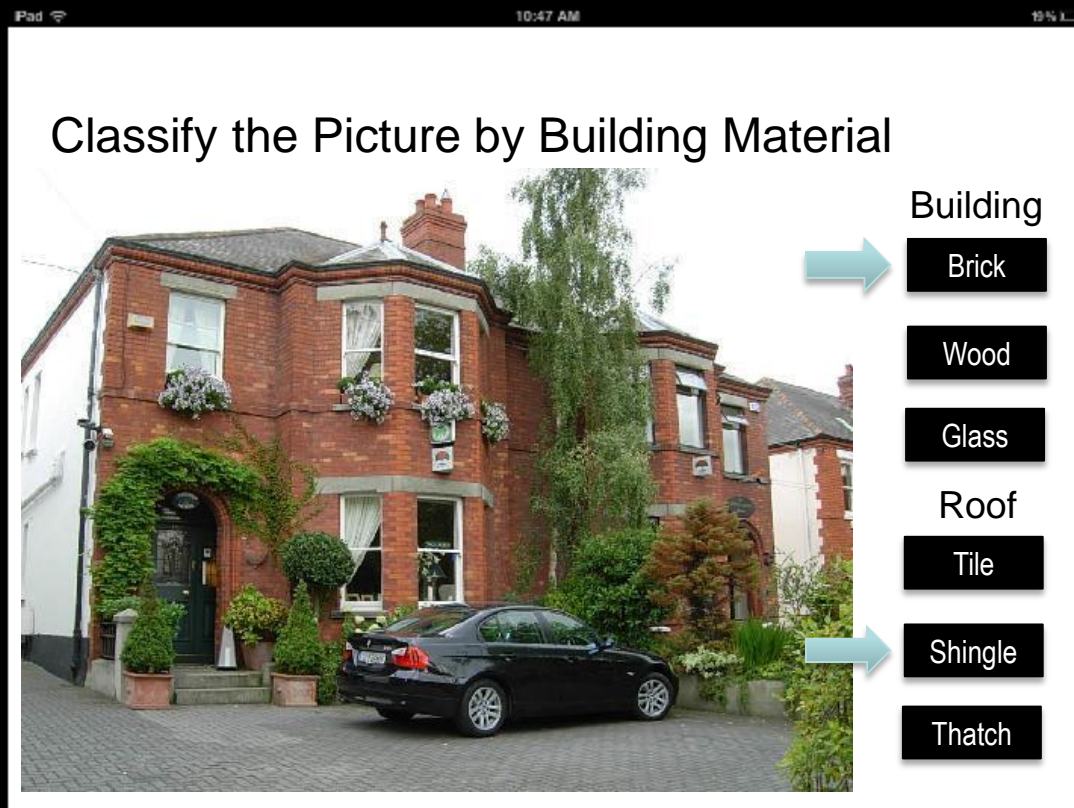
Example Serious Game Interfaces



Follow us on [twitter](#) to get the latest news about Cropland Capture!

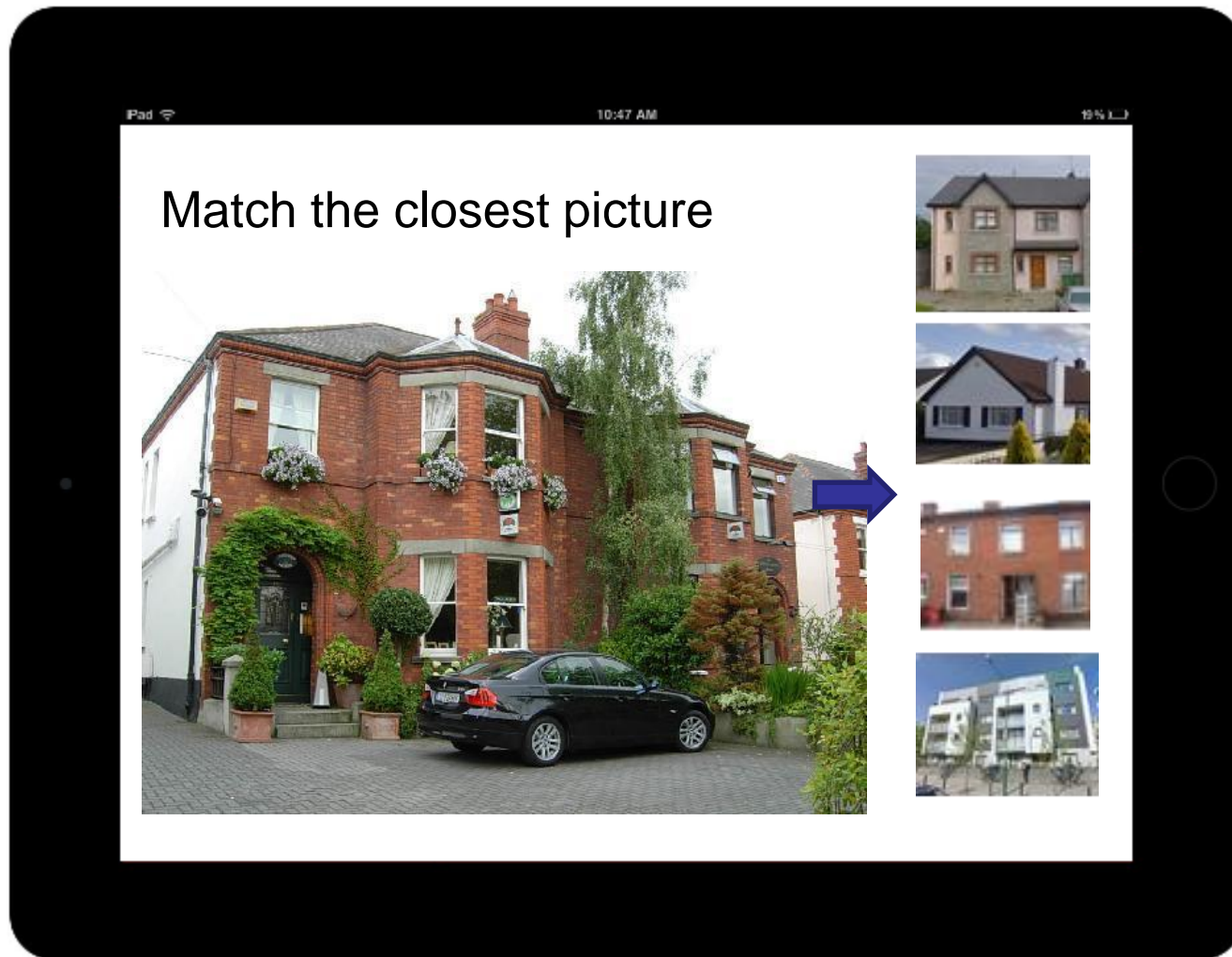


App to Gather Information from Photos: Type 1



- Geotagged pictures from different sources (e.g. Flickr, crowdsourcing, Streetview)
- User would identify building materials and roof types
- Automatic translation to UCPs for each LCZ
- App could also be used to take pictures and classify buildings and roof materials

App to Gather Information from Photos: Type 2




- Typical photos collected by city experts
- Could have photos on a wheel on the right to encompass more than 4 photos
- Automatic translation to UCPs for each LCZ


Geopedia

Welcome to Geopedia


What Geopedia is

 Find out what Geopedia is and discover how it can help you to view and create spatial data.


Explore existing geospatial data

 Find interesting data to browse.


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 Click here to go to the help pages. Help is also available at the top right of your browser window.

Terms and conditions

 View the terms and conditions for using Geopedia maps and geospatial data.

About Geopedia

 Geopedia was established with a desire to have the ability to store, view and edit geographic data in one place.

Geopedia World Launch

Visualization of LCZs

The screenshot displays the Geopedia web application interface. At the top, the browser address bar shows the URL http://geopedia.world/#T4_x181002.88297929728_y604. The page header includes the Geopedia logo, navigation links (Portal, Help, Terms, En, Login), and a set of utility icons (print, share, zoom, etc.).

The main content area is divided into three tabs: INFO, CONTENT, and RESULTS. The CONTENT tab is active, showing a sidebar menu for the location 'Wudapt'. The sidebar menu includes the following items:

- LCZ
- LCZ
- LCZ - pixels
- Supporting data
- Buildings
- LCZ - street view
- Urban Areas
- Wudapt test-case - buildings
- Panoramio photos
- Urban Areas
- Urban Atlas
- Urban Atlas Cities
- WUDAPT maps
- Statistics
- LCZ - building height

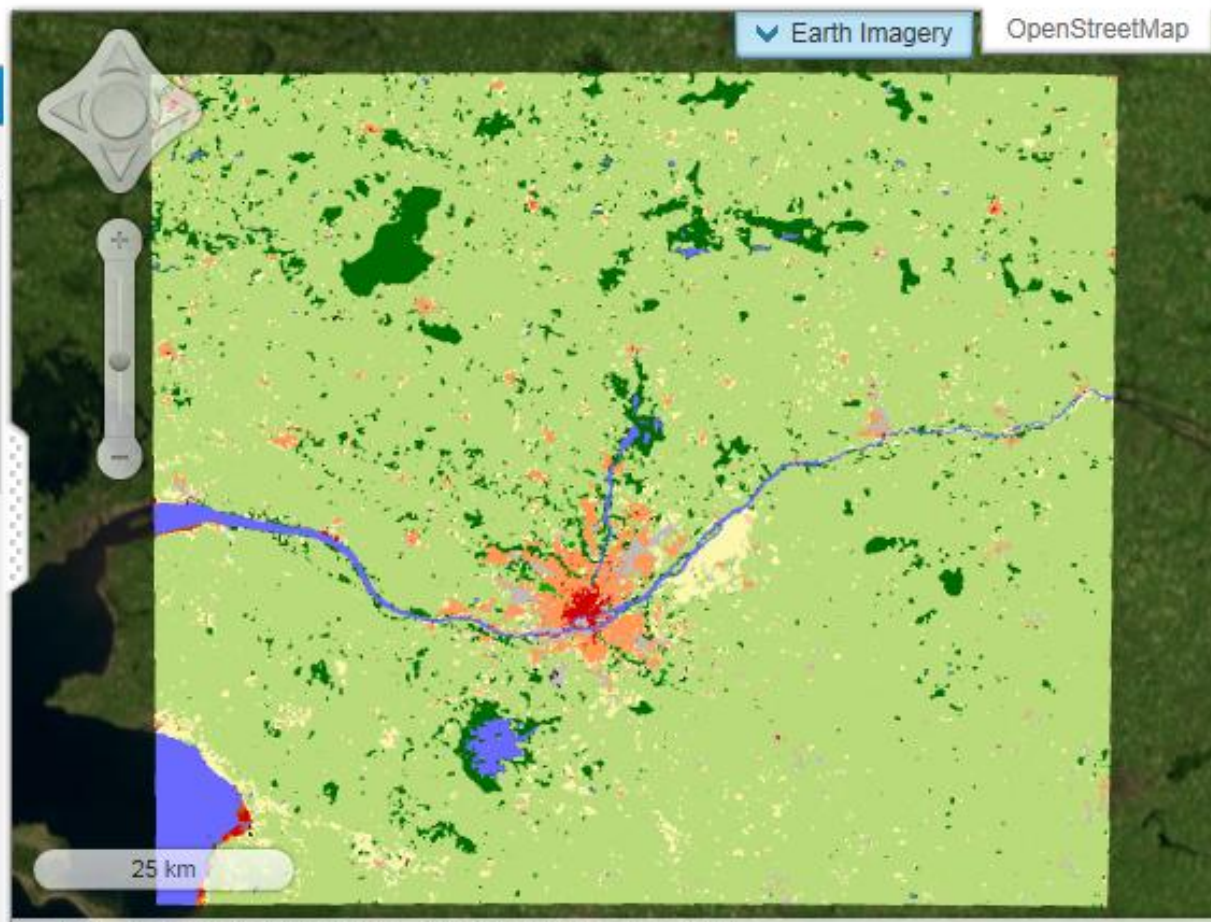
The main map area shows a satellite view of the Wudapt region. A scale bar indicates 250 km. The map includes a compass rose and a vertical zoom slider. The map data is sourced from Earth Imagery and OpenStreetMap. The bottom of the map displays the coordinates: E N: -1037097.6 6726458.489 51°35'26.60" N 9°18'59.06" W, and the copyright information: © 2015 Sinergise d.o.o. | Data: Uearthed Outdoors, LLC.

Geopedia



INFO **CONTENT** RESULTS

- Wudapt +
- LCZ
- LCZ *i*
- LCZ - pixels *i*
- Supporting data
- Buildings *i*
- LCZ - street view *i*
- Urban Areas *i*
- Wudapt test-case - buildings *i*
- Panoramio photos *i*
- Urban Areas *i*
- Urban Atlas *i*
- Urban Atlas Cities *i*
- WUDAPT maps *i*
- Statistics
- LCZ - building height *i*
- <http://geopedia.world/#T4> *i*



E N: -248573.216 6020486.096 47°28'41.64" N 2°13'58.70" W
© 2015 Sinergise d.o.o. | Data: [Unearthed Outdoors, LLC.](#)

Collection of Level 1 Data

The screenshot displays the Geopedia web application interface. At the top left is the Geopedia logo. The top navigation bar includes links for Portal, Help, Terms, a language selector (English), and a user greeting (Greetings, Linda See). Below this is a toolbar with icons for home, share, print, delete, and refresh. The main map area shows a street grid with buildings highlighted in red and green. Labels on the map include 'Cork Street', 'Village House', 'Rehoboth Place', '326-328', 'John Player Wills Factory, (Closed)', 'White Heather Industrial Estate', 'Priestfield Drive', 'Dolphin Avenue', 'Anne's Road South', and 'South Circular'. A scale bar indicates 75 meters. The bottom status bar shows the URL <http://www.geopedia.world/#T4>, coordinates $-699665.751\ 7044611.865\ 53^{\circ}19'54.53''\ N\ 6^{\circ}17'6.74''\ W$, and copyright information: © 2015 Sinergise d.o.o. | Data: terrestris GmbH. A sidebar on the left contains 'INFO', 'CONTENT', and 'LA' tabs, with a filter for 'Wudapt test-case - buildings'.

Collecting Data on Individual Buildings

Number of storeys: *

Building material: *

Roof: *

Type of building: *

Type of building - Other:

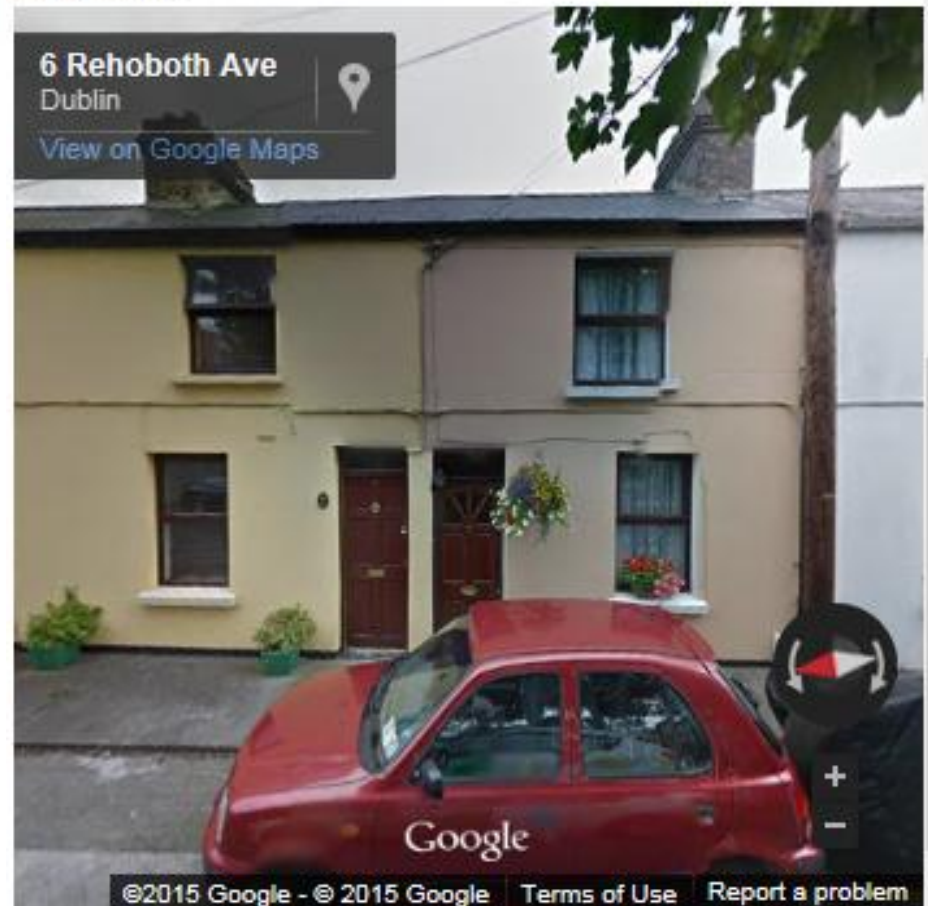
Detached?: *

Proportion of front that has windows: *

Age of building:

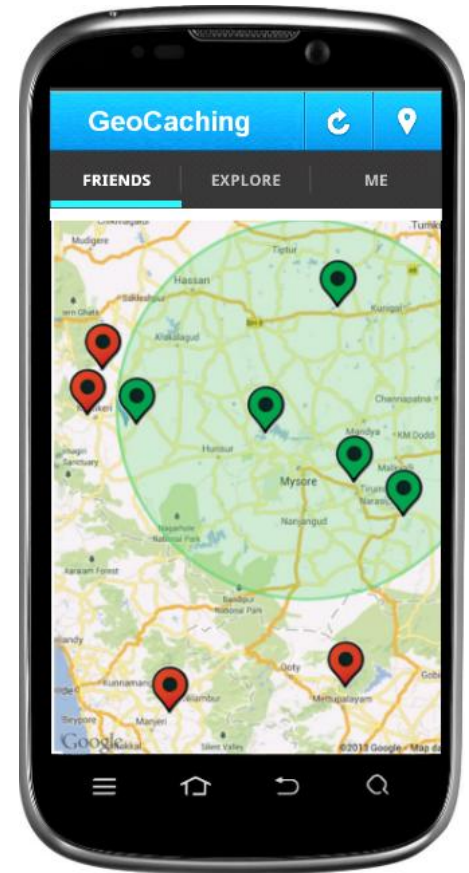
Albedo:

Street view:



FotoQuest Austria

- Part of the ERC CrowdLand project
- Combines science with photography and outdoor exploration (photocaching)
- Month long citizen science campaign
- Mobile phone app to take pictures at specific locations using a protocol
 - 4 directions
 - Questions about the land cover



Information Needed on Urban Form and Function – Level 2

Feature	Variable
Cover	Land cover, vegetation type, vegetation organization
Geometry	Building height, width of streets, contiguous or isolated buildings, roof geometry
Material	Wall type, roof type, window type, road materials, window fraction on the wall, colour/albedo
Function	Building use, irrigation, road type, temperature settings, occupancy, air conditioning, shutters or shading, window opening, building age, building renovation post 1990

Next Steps

- Expand LCZ classifications to as many cities as possible
- Begin level 1 data collection (Geo-Wiki / expert-sourcing to sample land cover types for cities with LCZs)
- Use Geopedia to extract information on buildings, roads, vegetation
- Further develop methods, protocols and tools for Level 1 data collection

Wudapt.org: Join mailing list for more info

World Urban Database

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[Events](#) ▾

[Local Climate Zones](#) ▾

[Papers](#)

[Want to get involved?](#)



ICUC'9 (9th International Conference on Urban Climate)

Plus in Toulouse, July 20-24 2015

The World Urban Database and Access Portal Tools (WUDAPT) is an initiative to collect data on the form and function of cities around the world.

The impact of cities on the climate at urban, regional and global scales is a topic of considerable debate. Much of the relevant research to date has been focused on mapping urban centers using demographic and administrative information, often supplemented by remote sensing. However, these data provide no information on the internal make-up of cities, which is important for understanding their impact on the environment as well as their vulnerability to change. The most recent report from the Intergovernmental Panel on Climate Change (IPCC) notes the dearth of information on urban areas. The WUDAPT initiative is designed to fill this gap.

Wudapt.org



Create LCZ Training Areas

Follow the simple steps outlined here to create LCZ training areas for your city

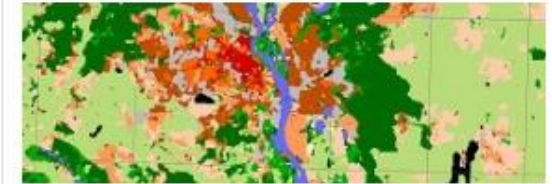
[Read More »](#)



Classify your City

Follow the step-by-step instructions to create an LCZ classification of your city

[Read More »](#)



View LCZ maps

Access LCZ maps for different cities around the world using Geopedia

[Read More »](#)

- Missing a way to:
 - contribute or upload maps / data
 - download data ('access' part)
 - process data ('portal' part)



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Questions?



IIASA, International Institute for Applied Systems Analysis

Funding by
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