

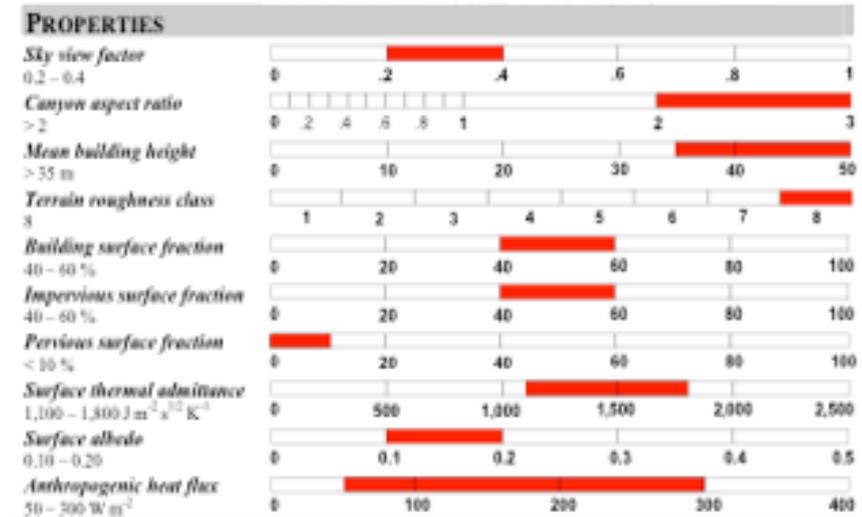
# Generating WUDAPT's Specific Scale-dependent Urban Modelling and Activity Parameters: Collection of Level 1 and Level 2 Data

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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

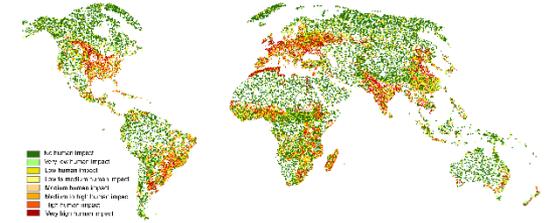
# Information Needed on Urban Form and Function

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.



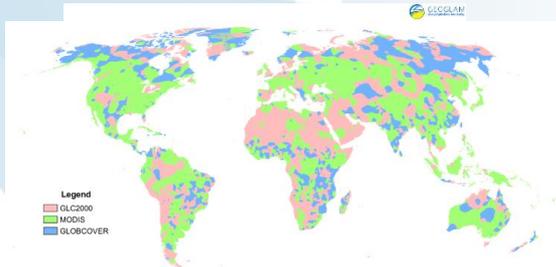
# Crowdsourcing of Land Cover (Google Earth, Bing Maps)



# 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)





# 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 for "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 navigation and settings. It includes a "Don't show any overlays" checkbox, a "Dublin" dropdown menu, and radio buttons for "Dublin Urban Atlas", "Dublin Building Footprints", and "Dublin LCZ". There are "Start validation" and "Stop" buttons. Below these are buttons for other cities: Hamburg, Houston, Sao Paulo, Medellin, Kuala Lumpur, Additional Data, and Geocoding.
- Center Panel:** A satellite map of a city area in Dublin, Ireland. A red rectangular box highlights a specific urban block. Street names visible include Portland Place, Belvidere Road, Sherrard Street, and R101.
- Right Panel:** Contains the validation controls. It has tabs for "LC", "Pics", "OSM", and "LCZ". Under "LCZ validation:", there is a "Select a building type:" section with 10 3D building icons. Below that is a "or select a landcover type:" section with 7 flat color icons. At the bottom is a "Submit:" section with a "Submit validation" button.

# Level 1: Sampling Across LCZs

The screenshot displays the GEO-Wiki CITIES web application interface. At the top left, the logo for GEO-Wiki CITIES is visible. Below it, there is a search bar containing "Cities (dev)". On the right side of the top navigation bar, there are links for "Homepage", "geolms", and "Logout".

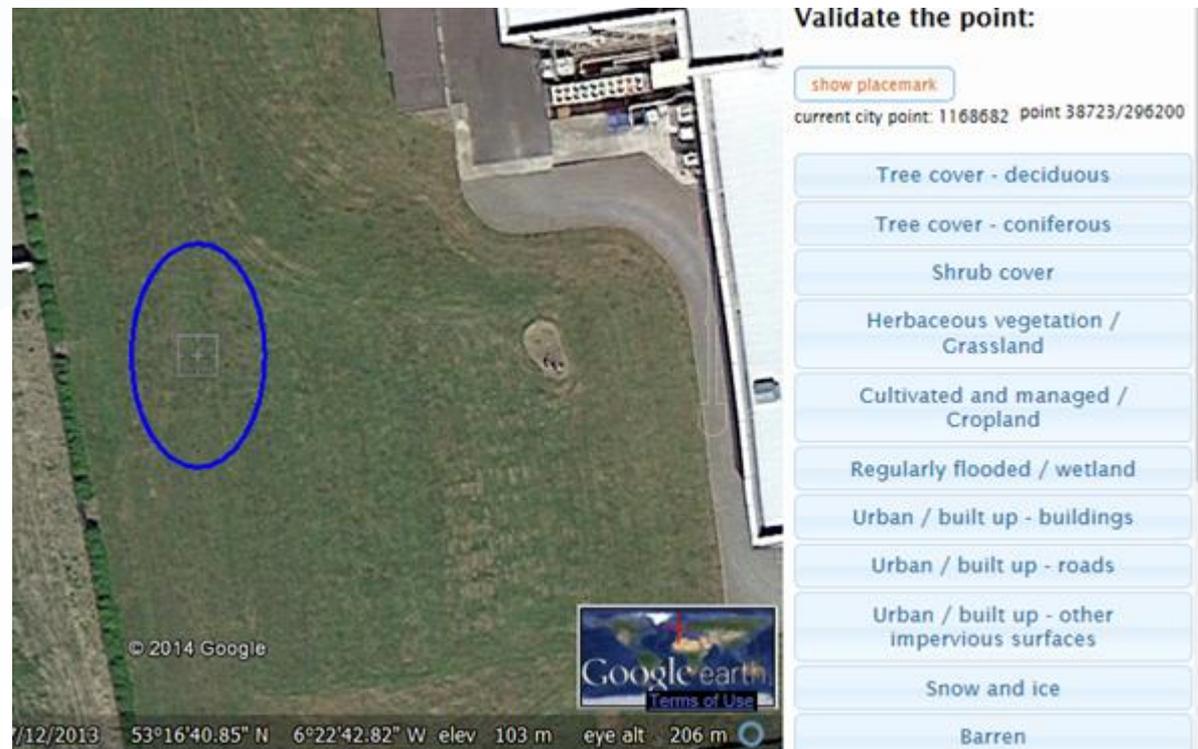
The main content area features a satellite map of a city, likely Dublin, with a red polygon highlighting a specific area. The map includes street names such as "Belvidere Road", "Portland Street North", and "Russell Street". A blue rectangle is also visible on the map, encompassing a larger area.

On the left side of the interface, there is a sidebar with navigation options. It includes a "Don't show any overlays" checkbox and a "Dublin" dropdown menu. Under "Dublin", there are radio buttons for "Dublin Urban Atlas", "Dublin Building Footprints", and "Dublin LCZ". Below these 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.

On the right side, there is a "Validate the polygon:" section. It contains several sliders for different land cover categories, each with a 50% value and a corresponding colored bar: Buildings (red), Impervious surface (grey), Unmanaged surface (orange), Coniferous trees (dark green), Deciduous trees (medium green), Pervious surface (light green), and Water surface (blue). Below these sliders, the "TOTAL" is displayed as 350%. There are also input fields for "Comment:", "Google Image Date:", and a "Submit:" button with a "Submit validation" label.

# 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	<b>Building height</b> , width of streets, contiguous or isolated buildings, <b>roof geometry</b>
Material	Wall type, <b>roof type</b> , window type, road materials, <b>window fraction on the wall, colour/albedo</b>
Function	Building use, irrigation, road type, temperature settings, occupancy, air conditioning, shutters or shading, window opening, <b>building age</b> , building renovation post 1990

# Using Pictures to Extract Data

The screenshot displays the GEO-Wiki Cities web application. At the top left, the logo for GEO-Wiki Cities is visible. Below it, there 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 in Dublin, Ireland, showing brick houses and parked cars. On the right side of the image, there is a classification form titled "Classify the photos:". The form includes tabs for "LC", "Pics", "OSM", and "LCZ". The "Pics" tab is selected. The form contains the following fields and options:

- 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 Addis Ababa. The "Dublin" city is currently selected.

# Example Serious Game Interfaces



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

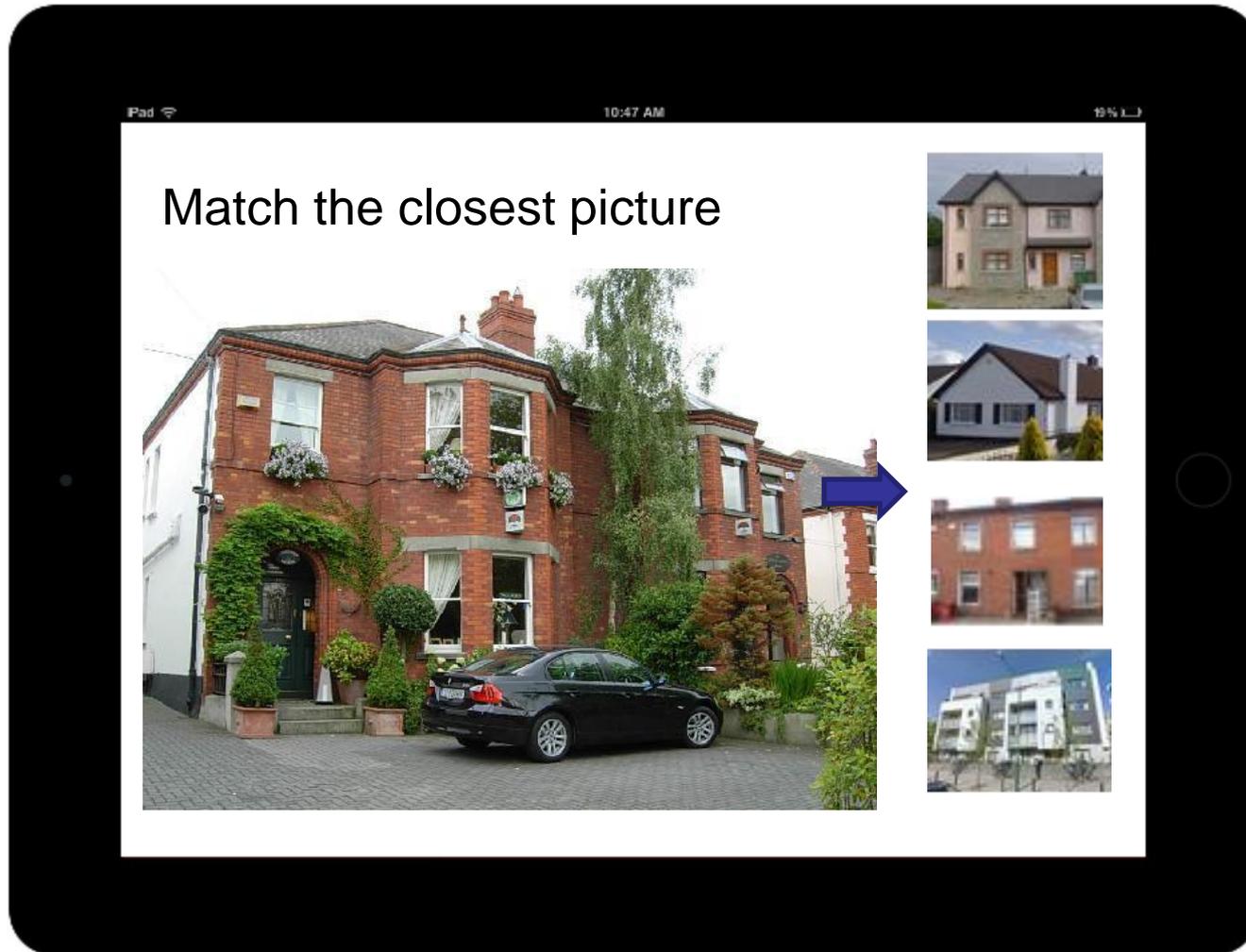


# App to Gather Information from Photos: Type 1



- 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.

**Learn about Geopedia's features**

 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\\_y604t](http://geopedia.world/#T4_x181002.88297929728_y604t). The page header includes the Geopedia logo, navigation links (Portal, Help, Terms, En, Login), and a set of interactive icons. A left sidebar contains a menu with the following items:

- Wudapt
- 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 Europe with a 250 km scale bar. A coordinate box at the bottom of the map displays: E N: -1037097.6 6726458.489 51°35'26.60" N 9°18'59.06" W. The footer includes the copyright notice: © 2015 Sinergise d.o.o. | Data: Unearthed Outdoors, LLC.

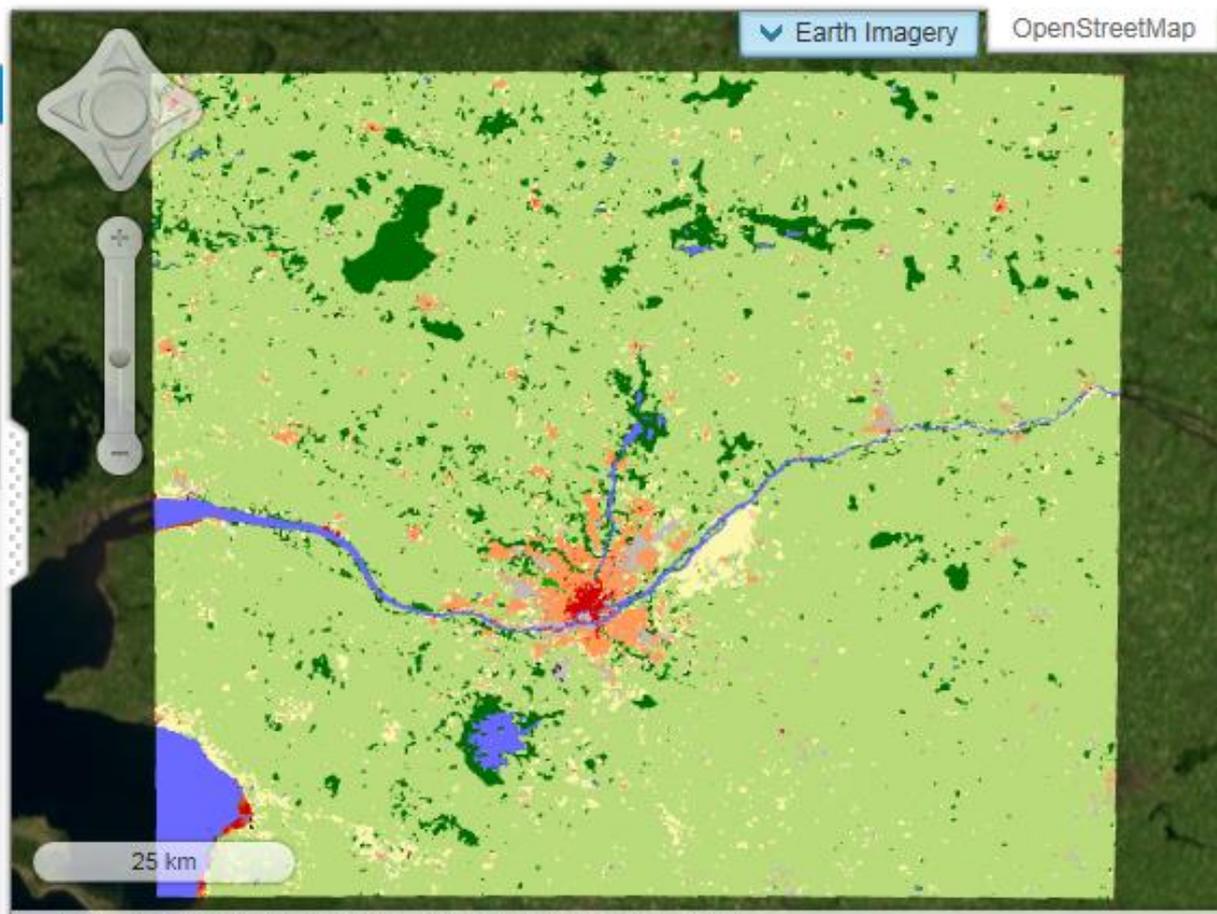
# Geopedia



INFO **CONTENT** RESULTS

- Wudapt
- 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
- <http://geopedia.world/#T4>

Earth Imagery OpenStreetMap



E N: -248573.216 6020486.096 47°28'41.64" N 2°13'58.70" W  
© 2015 Sinergise d.o.o. | Data: Unerthed 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 for Linda See. Below the navigation bar are several utility icons. 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. On the left side, there is a sidebar with 'INFO CONTENT' and a search bar containing 'Wudapt test-case - buildings'. At the bottom, the URL is <http://www.geopedia.world/#T4>, followed by coordinates:  $-699665.751\ 7044611.865\ 53^{\circ}19'54.53''\ N\ 6^{\circ}17'6.74''\ W$ . The footer contains the copyright information: © 2015 Sinergise d.o.o. | Data: terrestris GmbH.

# Collecting Data on Individual Buildings

Number of storeys: \*

Building material: \*

Roof: \*

Type of building: \*

Type of building - Other:

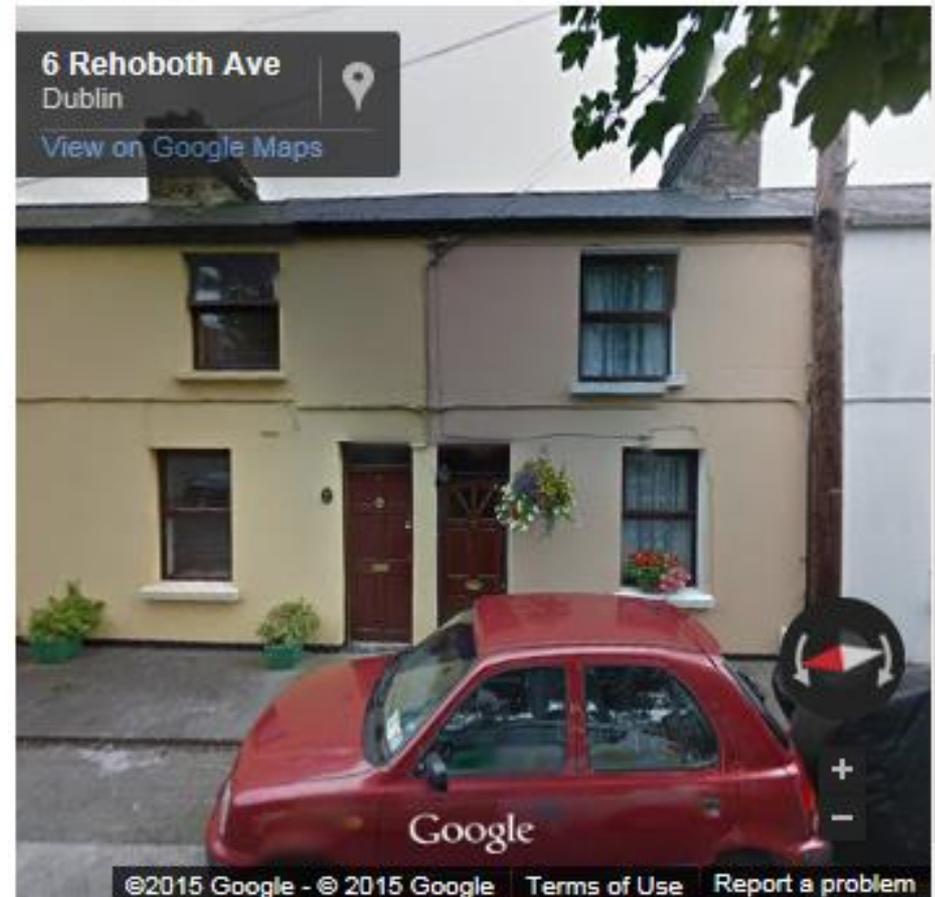
Detached?: \*

Proportion of front that has windows: \*

Age of building:

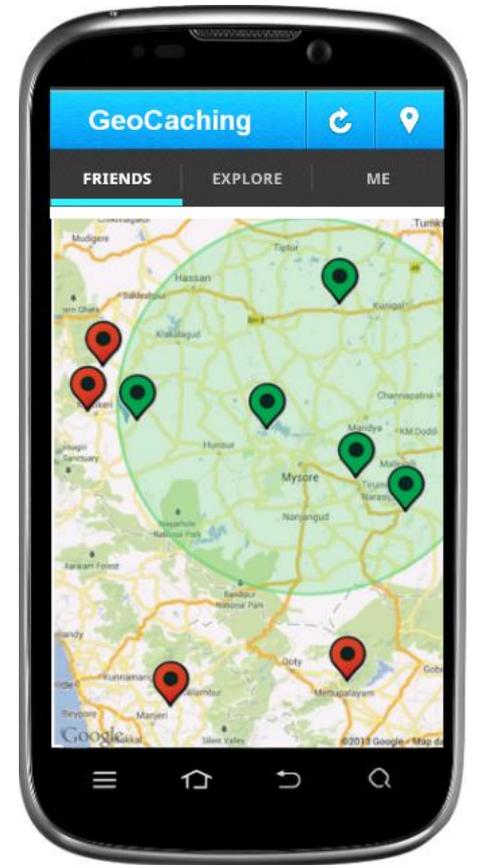
Albedo:

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

<b>Feature</b>	<b>Variable</b>
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

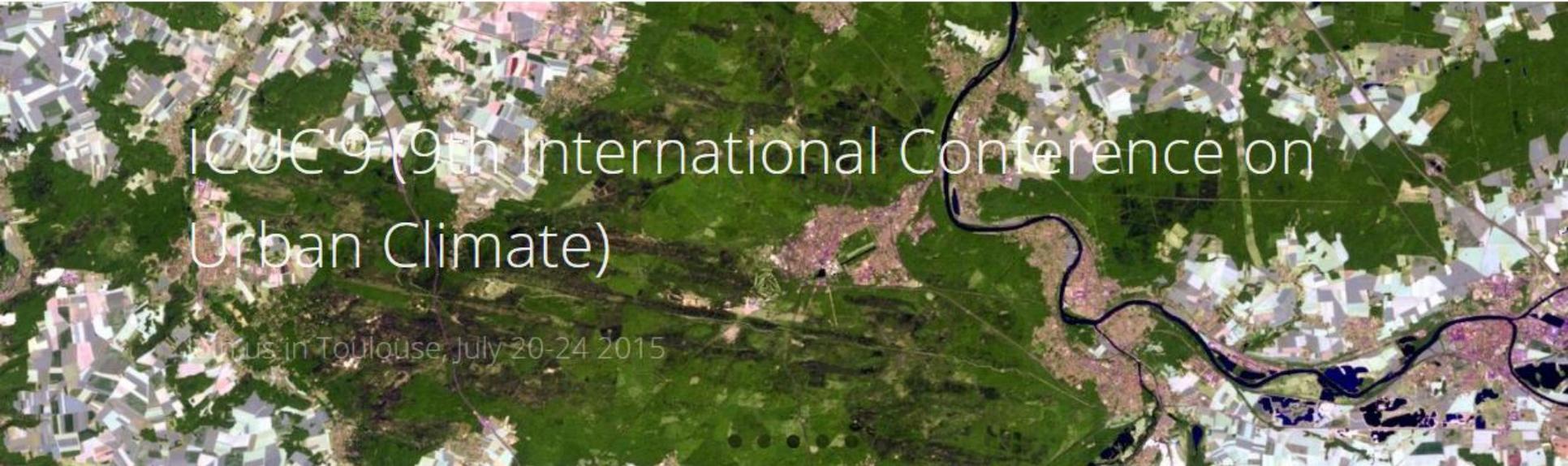
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[Local Climate Zones](#) ▾

[Papers](#)

[Want to get involved?](#)



## ICUIC 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

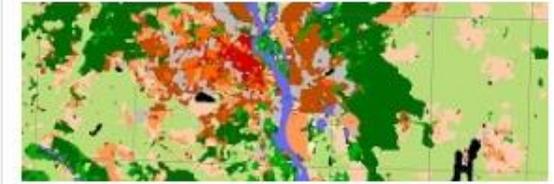
[Read More »](#)



## 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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science for global insight

See you at the  
workshop!  
Wed at 4pm

Questions?



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