

Fotoquest go: a smartphone app to collect land cover and land-use data

Steffen Fritz

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**Earth Observations Group
Ecosystems Service and Management (ESM)**

Geo-Wiki Engagement Platform

Geo-Wiki is an open platform that provides citizens with the means to engage in environmental monitoring by providing feedback on existing spatial information overlaid on satellite imagery or by contributing entirely new data.

Get involved now!
Participate in these ongoing projects and join the citizen science movement to help us address global land cover issues.

- Picture Pile**: Sort pictures and win great prizes! You can help us tackle global issues like deforestation.
- FotoQuest Austria**: Join FotoQuest Austria and explore the outdoors! Help us monitor changes in land use and land cover.
- Geo-Wiki pictures**: Capture different landscapes using your smartphone and share with others through Geo-Wiki.
- LACO-Wiki**: Discover the new web portal to validate your map products from local to global scales.

Visualize and provide feedback!
Engage in global environmental monitoring and collaborate with leading scientists

- Land Cover
- SIGMA
- Livestock
- Biomass
- AusCover
- Risk

Login
Email:
Password:
 Remember me next time?

[I've lost my password](#)
[Register here!](#)
Try Geo-Wiki

Administration
» Smartphone Legends

Tweets

Picture Pile 14 Oct
@picturepile
Already over 25,000 pictures have been sorted! This is a picture pile higher than an average room (243 meters)! Unbelievable! Thank you!
Retweeted by BASA Geo-Wiki

Picture Pile 12 Oct
@picturepile
#PicturePile has started! Sort picture piles to win great prizes and to tackle global issues like deforestation!
geo-wiki.org/games/picturep...

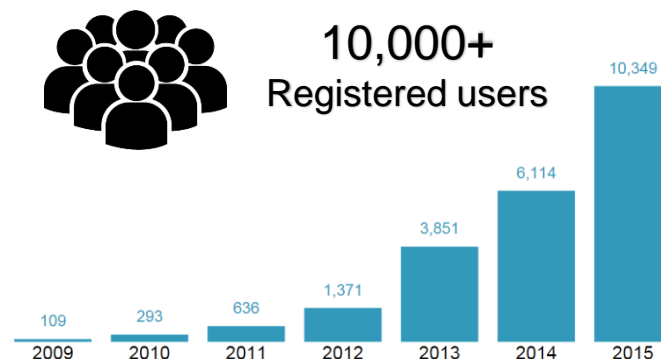
Tweet to @Geo_Wiki

453

+32 Recommend this on Google



<http://www.geo-wiki.org/>



Logging in / Languages

LACO-Wiki The Land Cover Validation Platform



Home

Welcome to LACO-Wiki

Data

Create and manage data

Samples

Generate your validation samples

Validations

Interpretate your samples

Reports

View your validation results

Login

Login to LACO-Wiki

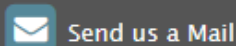
To enjoy the benefits of validated landcover datasets you have to login with one of the following Accounts:



The Facebook logo, consisting of the word "facebook" in white lowercase letters on a dark blue rectangular background.



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Project Members



Languages



English | Deutsch

Overview

- Upload
- ↓
- Sampling
- ↓
- Validation
- ↓
- Reporting

Dataset Details

Basic Information

Dataset Name: LCZ Map of Dublin
 Dataset Type: Raster
 Land Cover Type: Categorical
 Uploaded: September 29, 2015 8:40 PM

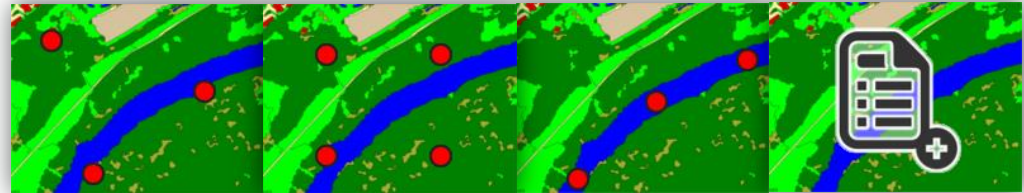
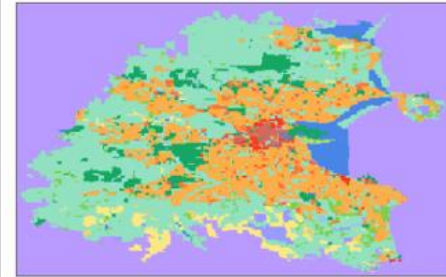
Dataset Description

This is a Local Climate Zone (LCZ) map of Dublin, which was created using Landsat and other input datasets.

Raster Details

Raster Type: System.Byte
 Extent: [-6.56213136959318 53.187245190463024

Preview Image



Validation 5 of 100

Classification:

Trees (9)

Correct

Incorrect

Classification Data	Reference Data													Row Total	User Accuracy			
	Building (1)	Other constructed area (2)	Barren (3)	Barren (4)	Barren (5)	Surface water (6)	Snow (7)	Ice (8)	Trees (9)	Bushes (10)	Overlapped (11)	Herbaceous vegetation (12)	Reed (13)			Grassland (14)	Clouds (15)	
Buildings (1)	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.50000
Other constructed area (2)	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1.00000
Barren (3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00000
Snow (7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00000
Barren rock (5)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00000
Surface water (6)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00000
Snow (7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00000
Ice (8)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00000
Trees (9)	0	0	0	0	0	0	0	0	8	0	0	0	1	0	0	0	9	0.88889
Bushes (10)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.00000
Overlapped (11)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00000
Herbaceous vegetation (12)	0	0	1	0	0	0	0	0	0	0	0	0	10	0	0	0	11	0.90909
Reed (13)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00000
Grassland (14)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00000
Clouds (15)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00000
Column Total	100.000	94.075	0.000	0.000	0.000	0.000	0.000	0.000	100.000	0.000	0.000	94.075	0.000	0.000	0.000	0.000	100.000	
Producer Accuracy	100.000	94.075	0.000	0.000	0.000	0.000	0.000	0.000	100.000	0.000	0.000	94.075	0.000	0.000	0.000	0.000	100.000	
System Accuracy	94.075	94.075	0.000	0.000	0.000	0.000	0.000	0.000	94.075	0.000	0.000	94.075	0.000	0.000	0.000	0.000	94.075	
Allocation Disagreement	0.96667																	
Jacc	0.24419																	
Kappa	0.2483975																	
Overall Accuracy	0.7																	
Quantity Disagreement	0.2333333																	

» Fotoquest

Table 6. Land cover main agreement (Ag) areas (sorted by percentage covered in FotoQuest Austria) between the two systems. Number of observations (*n*) is shown.

Type	Coverage in FotoQuest Austria (%)	Level 1		Level 2		Level 3	
		<i>n</i>	Ag (%)	<i>n</i>	Ag (%)	<i>n</i>	Ag (%)
Grassland	29	143	62	138	33	99	0
Cropland	22	111	89	100	51	78	50
Artificial Land	22	110	90	109	39	100	21
Woodland	18	90	60	87	29	67	19
Others	9	43	0-76	43	0-76	29	0

Crop Type at Level 3, Cropland	<i>n</i>	Agreement (%)
Maize	32	81
Common Wheat	5	80
Clovers	3	33
Barley	7	14
Vineyards	4	1
Soya	11	0
Other root crops	4	0
Others	12	0-1

FotoQuest Go 2017



FotoQuestGo

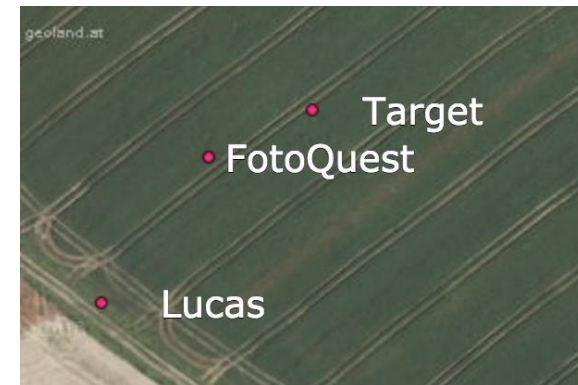
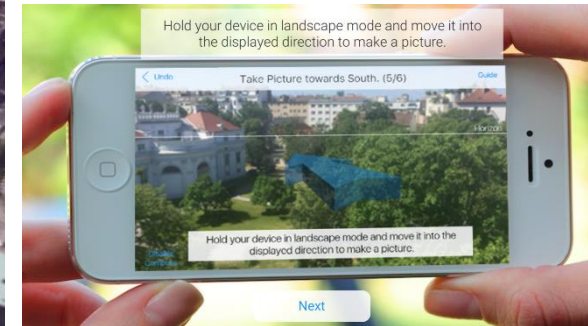
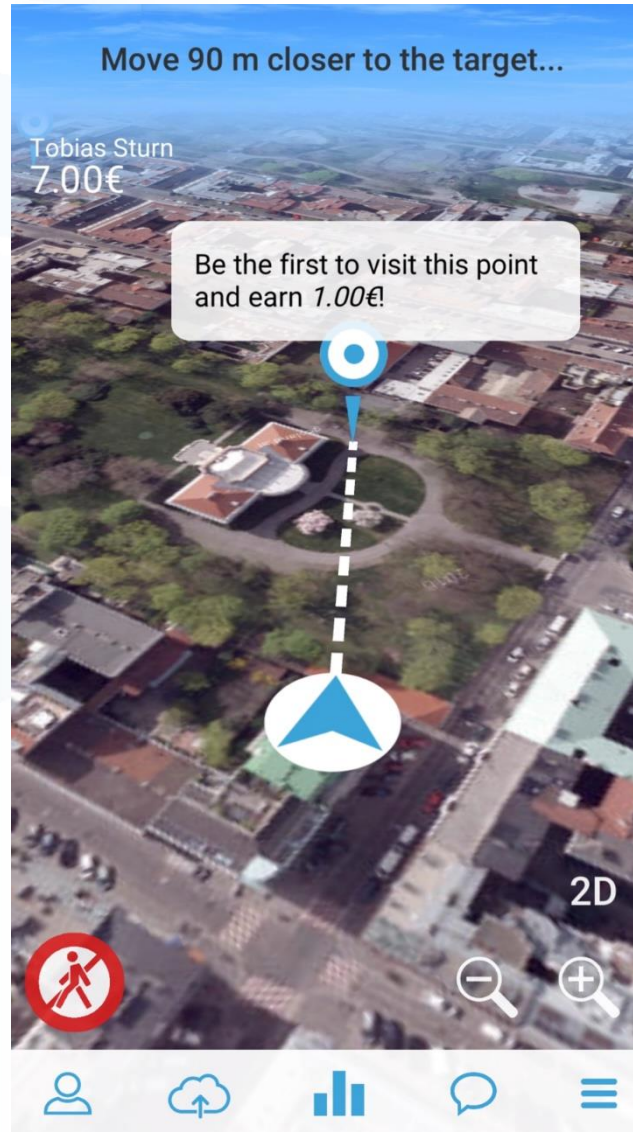


FotoQuest Go

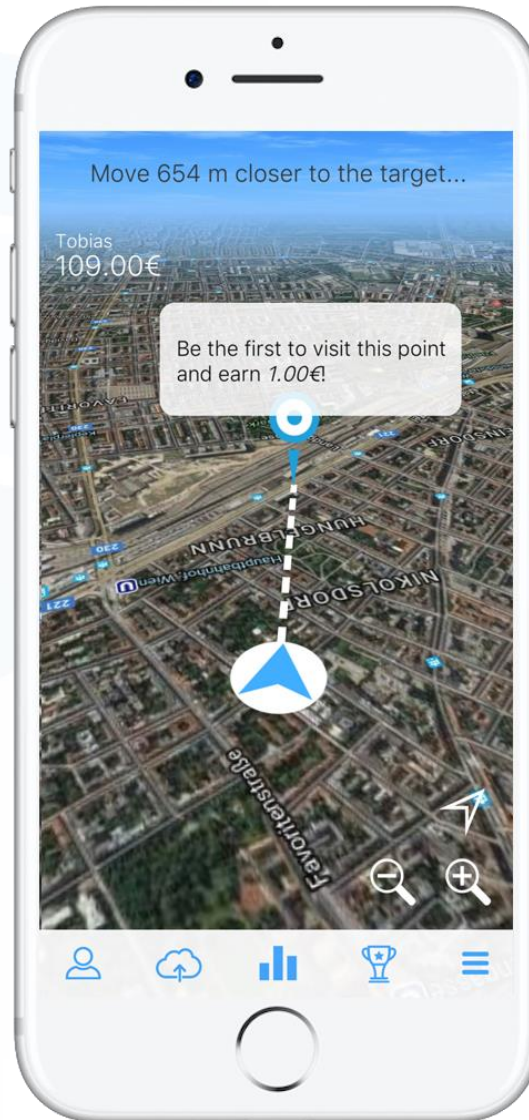
Visit the points indicated on the map and help us monitor how land is being used in Austria!

You can earn 1 EUR for each point you visit!

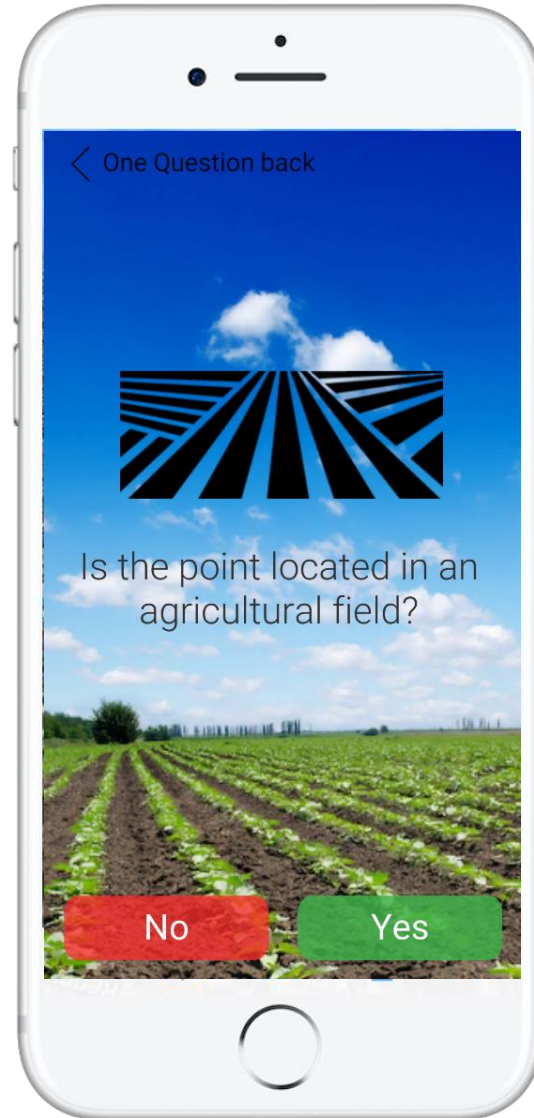
Next



2. Try to get as close to the point as possible



3. When you are at the point take pictures and answer some questions on land cover and land use



FotoQuest Go Quality Assurance



FOTOQUEST QUALITY CHECK

FotoQuest Quality Check (dev)

esja1803@hotmail.com: 2017-11-08 10:48 - Zufahrt gesperrt da neben Autobahn

Other submissions by: esja1803@hotmail.com

- 2017-11-04 15:40
- 2017-10-04 16:06 - Maisfeld
- 2017-11-08 11:22 - Feld
- 2017-11-08 11:46
- 2017-10-26 17:38 - Feld
- 2017-10-12 09:39 - Befristetes forstlicher Sperrgebiet
- 2017-11-08 10:48
- 2017-09-30 16:18 - Feld
- 2017-10-03 17:03 - Firmengelände abgesperrt
- 2017-10-12 16:01 - Feld
- 2017-10-01 15:04
- 2017-11-10 12:57 - privateproperty
- 2017-10-09 17:24 - Wiese und Feld
- 2017-11-10 12:34 - Feld

Already checked submissions

Comparison

-

Skip reason: Zufahrt gesperrt da neben Autobahn

Point visible: no

User submission



• : NULL



- LC 1: C23 - Other coniferous woodland
- LU 1: U120 - FORESTRY

Classification

User submission	Lucas survey
• : NULL	<ul style="list-style-type: none"> • LC 1: C23 - Other coniferous woodland • LU 1: U120 - FORESTRY
CORINE Landcover 2000	CORINE Landcover 2006

Homepage

Tobias Sturn

Logout



Messaging

Title: Gratulation!

Message:

Gratulation! Deine Quest hat unsere Erwartungen erfüllt. Du bekommst 1 Euro für diese Quest

Send

One example of a FotoQuest Go user being closer to the target point.



FotoQuest Go statistics

July, 2015



200+
Players



2000+
Quests



12,000+
Photos



12%
Quests completed

12 weeks

September, 2015

July, 2015



300+
Players



4100+
Quests



22,000+
Photos



25%
Quests completed

total

September, 2016

FotoQuest Go Quality Check

- First 1 Euro locked
- Every submission needs to be approved
- Users get feedback on where to improve
- Feedback via app and email
- We get a better idea of the causes of error

- Examples:

FotoQuest directly on the point, LUCAS surveyor is far off

GEO Wiki FOTOQUEST QUALITY CHECK

FotoQuest Quality Check (dev) | Homepage | Mathias Karner | Logout

2017-11-11 08:39

2017-11-10 16:06

2017-11-04 13:51

2017-10-18 13:57

2017-10-18 13:56

2017-10-14 14:34

2017-10-05 15:29

2017-10-05 15:29

2017-10-05 11:14

2017-09-28 19:56

2017-09-28 13:57

2017-09-28 13:41

2017-09-24 13:09

2017-09-24 12:06

2017-09-22 15:14

2017-09-21 15:55

moorthy@iiasa.ac.at (4)

mowi@a1.net (3)

music-man@gmx.at (2)

natalie.edelbacher@gmail.com (2)

Nico.Nussbaumer13@gmail.com (3)

patricia_erler@aon.at (4)

peter.w.plesing@gmail.com (1)

...@... (17)



Comparison

Approved: yes

Skip reason: noskip

Point visible: yes

User submission

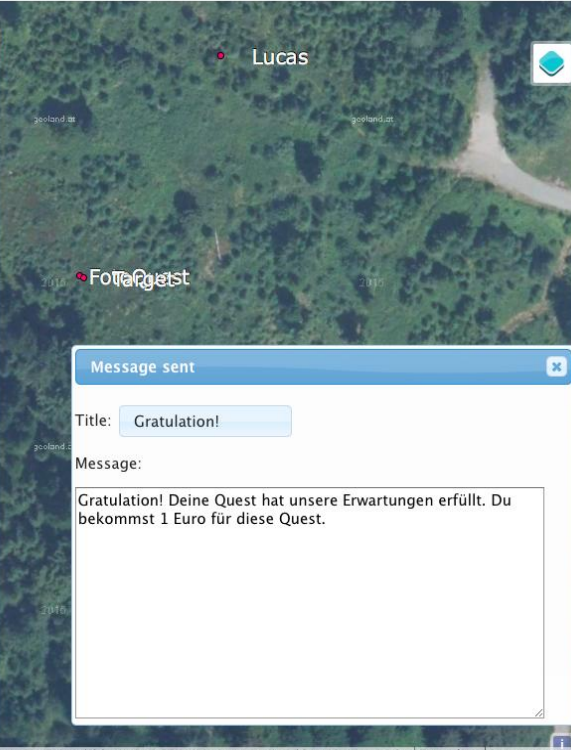



- Landcover: "CONIFEROUS WOODLAND"
- Landuse: FORESTRY

- LC 1: C23 - Other coniferous woodland
- LC 1 Species: C233 - null
- LU 1: U120 - FORESTRY

Classification

User submission	Lucas survey
<ul style="list-style-type: none"> Landcover: "CONIFEROUS WOODLAND" Landuse: FORESTRY 	<ul style="list-style-type: none"> LC 1: C23 - Other coniferous woodland LC 1 Species: C233 - null LU 1: U120 - FORESTRY



Message sent

Title: Gratulation!

Message:

Gratulation! Deine Quest hat unsere Erwartungen erfüllt. Du bekommst 1 Euro für diese Quest.

Well comparable pictures to LUCAS

The screenshot displays the 'Geospatial Land Cover Validation at Geo-Wiki' interface. The main content area is divided into four quadrants, each comparing a 'FotoQuest' image with a 'LUCAS' image. The top-left quadrant is labeled 'Photo north (LUCAS):' and shows a field with a direction of 1 (0,360) and tilt of 5. The top-right quadrant is labeled 'Photo east (LUCAS):' and shows a road with a direction of 100 (90) and tilt of -2. The bottom-left quadrant is labeled 'Photo south (FotoQuest):' and shows a field with a direction of 184 (180) and tilt of 0. The bottom-right quadrant is labeled 'Photo west (LUCAS):' and shows a field. A 'Message sent' dialog box is overlaid on the right side, containing the text: 'Title: Gratulation!' and 'Message: Gratulation! Du bekommst 1 Euro für diese Quest. Aber wir denken Dir ist beim Beantworten der Fragen zur Landbedeckung ein Fehler unterlaufen. Der Punkt befand sich nicht auf einem Forstwirtschaftsgebiet oder Wohngebiet. Bitte stell beim nächsten Mal sicher dass Du die Fragen richtig beantwortest.'

Geospatial Land Cover Validation at Geo-Wiki

FOTOQUEST

FotoQuest Quality Check (dev)

- ayachia.com (1)
- martina_kaufmann@gmx.at (4)
- maxerhart@gmx.at (75)
- Mayr.stefan@aon.at (1)
- mccallum@iiasa.ac.at (2)
- moni3345@gmx.at (16)
- moorthy@iiasa.ac.at (4)
- mowi@a1.net (3)
- music-man@gmx.at (2)
- natalie.edelbacher@gmail.com (2)
- Nico.Nussbaumer13@gmail.com (3)
- patricia_erler@aon.at (4)
- peter.w.plesing@gmail.com (1)
- pg7@sbox.tugraz.at (17)

2017-10-15 19:07
2017-10-15 19:06
2017-10-14 19:07
2017-10-14 19:07
2017-10-02 17:41
2017-09-29 16:27
2017-09-29 16:26
2017-09-29 16:26
2017-09-29 16:26
2017-09-23 20:58
2017-09-23 20:58

Photo north (FotoQuest):
Direction: 1 (0,360), Tilt: 5

Photo north (LUCAS):

Photo east (FotoQuest):
Direction: 100 (90), Tilt: -2

Photo east (LUCAS):

Photo south (FotoQuest):
Direction: 184 (180), Tilt: 0

Photo south (LUCAS):

Photo west (FotoQuest):

Photo west (LUCAS):

Secure Access SSL VPN - Windows Files

Homepage Mathias Karner Logout

Message sent

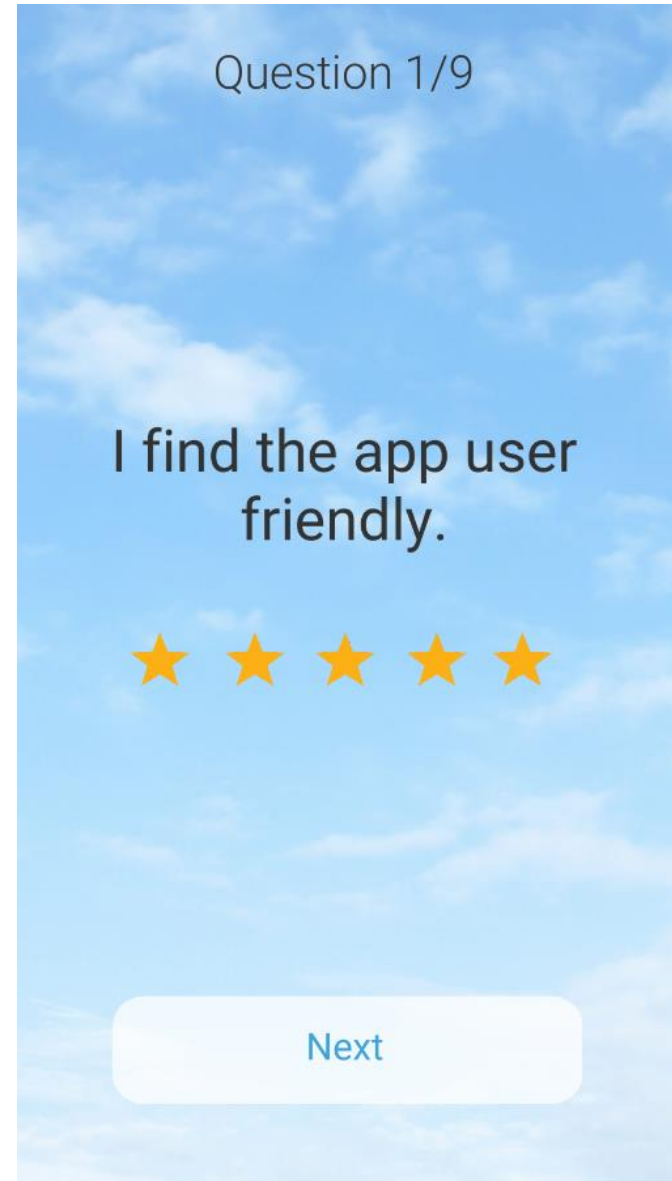
Title: Gratulation!

Message:

Gratulation! Du bekommst 1 Euro für diese Quest. Aber wir denken Dir ist beim Beantworten der Fragen zur Landbedeckung ein Fehler unterlaufen. Der Punkt befand sich nicht auf einem Forstwirtschaftsgebiet oder Wohngebiet. Bitte stell beim nächsten Mal sicher dass Du die Fragen richtig beantwortest.

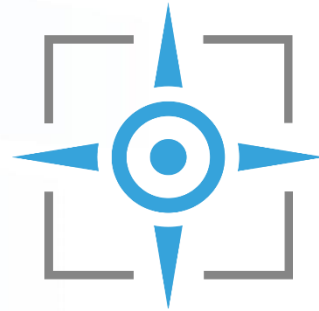
FotoQuest Go Questionnaire

- 60 users participated in the questionnaire
- 8 questions
- 1-5 stars



FotoQuest Go Questionnaire

- I find the app user friendly: ★ 4.1
- Using this app, I am happy to contribute to scientific research: ★ 4.7
- Using this app I can discover new landscapes: ★ 4.3
- I have fun while using the app: ★ 4.2
- I have a strong interest in nature: ★ 4.5
- I find this project interesting: ★ 4.6
- I enjoy being in the outdoors: ★ 4.6
- I am excited by the possibility of winning a prize: ★ 4.1



FotoQuestGo

www.fotoquest-go.org



Available on the
App Store



Get it on
Google™ play