1-3 February 2017, EVA-VGI meeting
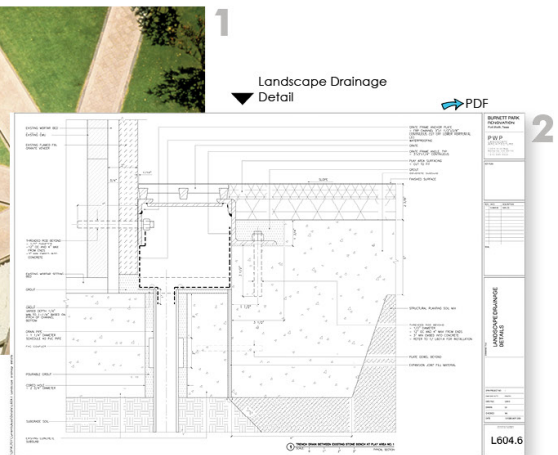
Visualizing VGI
for application to the fields of landscape and urban planning

Dr.-Ing. Alexander Dunkel, TU Dresden,
Department of Geosciences, Cartographic Communication

background

1

Landscape Drainage
Detail ▼

➡ PDF

2

▲ Burnett Park, Fort Worth,
TX

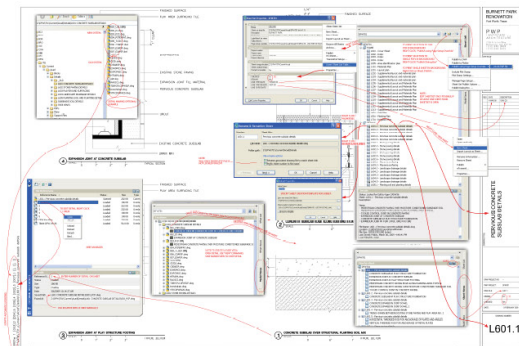L604.6

3

▲ AutoCAD Sheet Set manager implementation guide ➡ PDF

CONSTRUCTION DRAWINGS, FIELD COORDINATION

During my time at Peter Walker and Partners landscape architecture in Berkeley, I was primarily responsible for the coordinating of Burnett Park Renovation project in Fort Worth, TX **(1)**. This included compilation of a large number of construction drawings **(2)**. At the same time, I was able to introduce new software practices to the office such as sheet file organization **(3)**. Other projects I was involved at Peter Walker included the **Stanford Graduate School of Business Campus**, the **World Trade Center Memorial Plaza** redesign, and the **Sydney Waterfront (Barangaroo Headland Park)**.

2007 - 2009

1

UNIVERSITÄT
Überbaute Fläche
Grünfläche
Ackerflur

Concept/ Analysis ▲
➡ Brochure

1

▲ Illustration, central plaza design

▲ Still frame from 3D Animation, Design / Light Concept   ➡ Animation/Video

OPEN SPACE ANALYSIS AND DESIGN

During the last part of studying landscape architecture at the UT Dresden, I focused on classical landscape architecture open space design projects such as the redesign masterplan for the **UT Dresden CAMPUS (1), Wilhelm-Kuelz-Plaza Redesign (2),** or a project in cooperation with Addis Abeba to develop unused open space structures in critical areas of the city **(3)**.

2007 - 2009

ENTWURF DETAIL KERNCAMPUS

▲ Design plan close-up   ➡ Full Size

Landscape Architecture

Biodiversity map for Dresden

Water Quality

→ Brochure

1

→ Full Size

2

Example Environmental Impact Assessment Sheet for 1 of 178 construction sites in Dresden
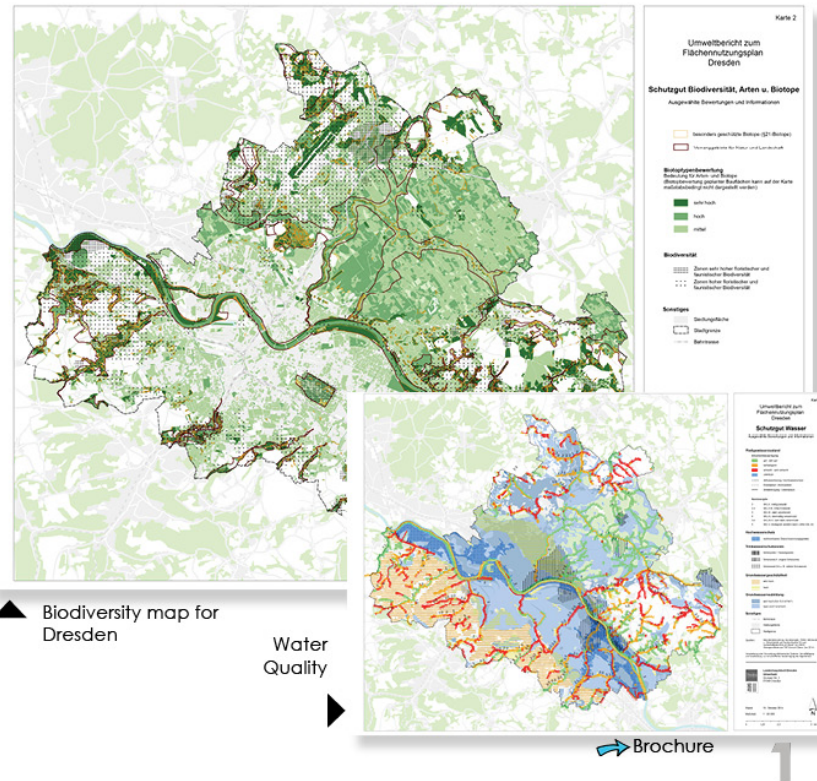
STRATEGIC ENVIRONMENTAL IMPACT ASSESSMENT

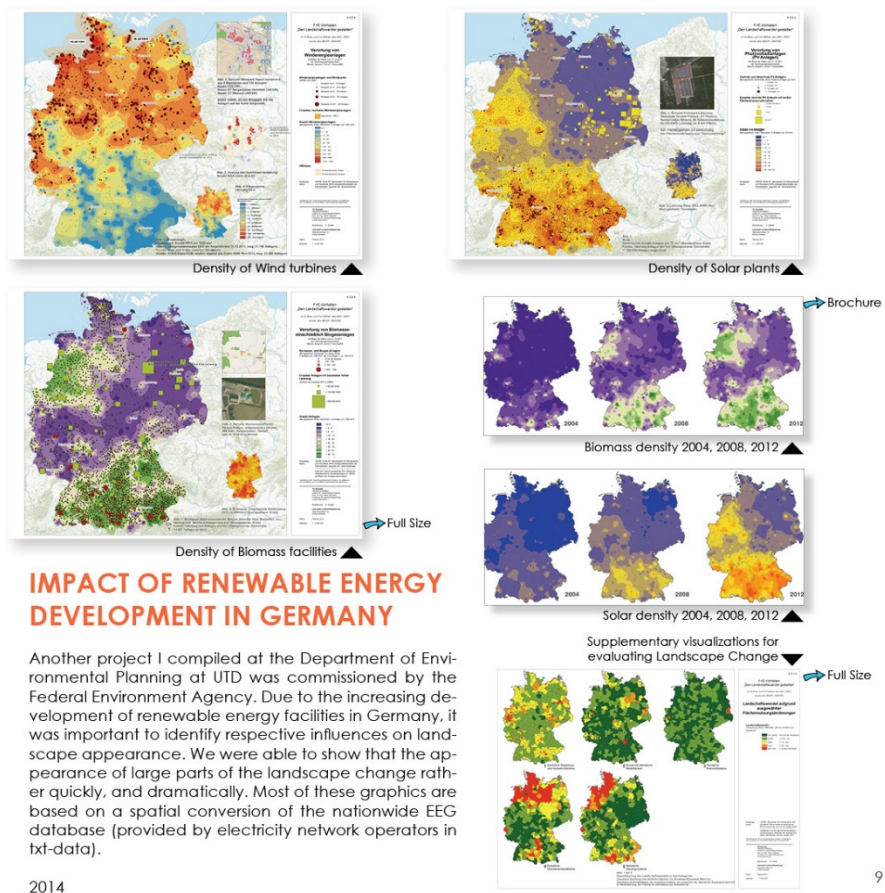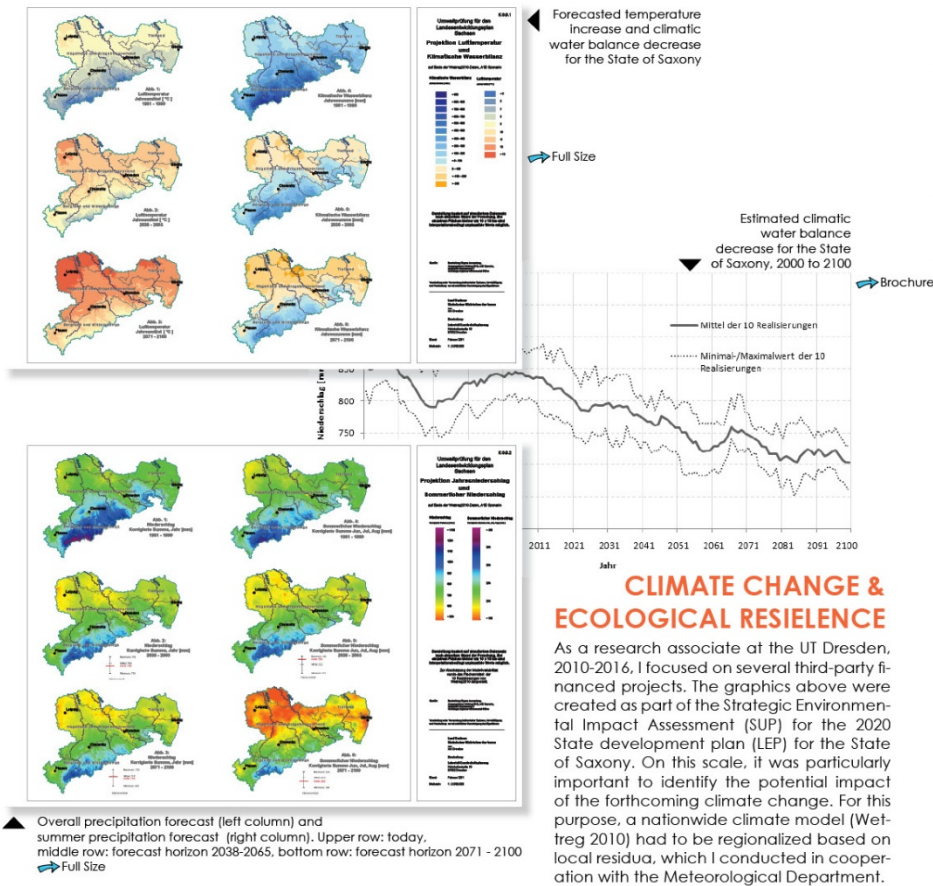Another Strategic Environmental Impact Assessment that I coordinated at the UT Dresden was compiled for the 2015 Land use plan (FNP) for the City of Dresden. This strategic city development plan designated about 180 new construction sites, whose environmental impact had to be assessed through plans (1) and on-site assessments (2). This project was insofar challenging as it required the synthesis of large amounts of information. For this purpose, a database interface was developed, which was finally used to automatically compile Assessment Sheets and statistics.

Landscape Planning

Forecasted temperature increase and climatic water balance decrease for the State of Saxony

Full Size

Estimated climatic water balance decrease for the State of Saxony, 2000 to 2100

Brochure

Mittel der 10 Realisierungen

Minimal-/Maximalwert der 10 Realisierungen

CLIMATE CHANGE & ECOLOGICAL RESIELENCE

As a research associate at the UT Dresden, 2010-2016, I focused on several third-party financed projects. The graphics above were created as part of the Strategic Environmental Impact Assessment (SUP) for the 2020 State development plan (LEP) for the State of Saxony. On this scale, it was particularly important to identify the potential impact of the forthcoming climate change. For this purpose, a nationwide climate model (Wettreg 2010) had to be regionalized based on local residua, which I conducted in cooperation with the Meteorological Department.

▲ Overall precipitation forecast (left column) and summer precipitation forecast (right column). Upper row: today, middle row: forecast horizon 2038-2065, bottom row: forecast horizon 2071 - 2100
Full Size

2012/13

Density of Wind turbines ▲

Density of Solar plants ▲

Brochure

Density of Biomass facilities ▲

Biomass density 2004, 2008, 2012 ▲

Full Size

Solar density 2004, 2008, 2012 ▲

IMPACT OF RENEWABLE ENERGY DEVELOPMENT IN GERMANY

Another project I compiled at the Department of Environmental Planning at UTD was commissioned by the Federal Environment Agency. Due to the increasing development of renewable energy facilities in Germany, it was important to identify respective influences on landscape appearance. We were able to show that the appearance of large parts of the landscape change rather quickly, and dramatically. Most of these graphics are based on a spatial conversion of the nationwide EEG database (provided by electricity network operators in txt-data).

2014

Supplementary visualizations for evaluating Landscape Change ▼
Full Size

Regional Planning

Problem(s):
Landscape and perception (= valuation)
of the landscape are inseparably intertwined.

people

imagination

landscape

influences
perception

NOOS

culture

action
impacts
landscape

BIOS   GEOS

nature

provides basis for
existence and action

time

Human/landscape interaction model (Tress & Tress, 2001; p.151)

Flickr

4 Facets:
(Panofsky-Shatford Matrix)

Location (Where?) = spatial
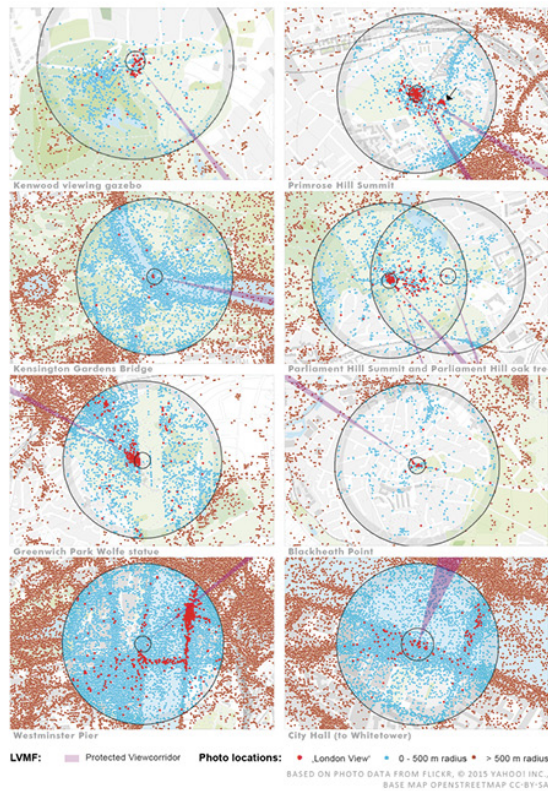
User origin (Who?) = social

Tags (What?) = thematic

Time (When?) = temporal

Photos:	57,537,317
Users:	618,973
Total # of Tags:	377,179,629
Distinct # of Tags:	7,164,666

57 Million Photo Locations in Europe

A. Dunkel, Source: Flickr, 2007-2015

Kenwood viewing gazebo
Primrose Hill Summit
Kensington Gardens Bridge
Parliament Hill Summit and Parliament Hill oak tree
Greenwich Park Wolfe statue
Blackheath Point
Westminster Pier
City Hall (to Whitetower)

LVMF: ▨ Protected Viewcorridor   Photo locations: ● London View   ● 0 - 500 m radius   ● > 500 m radius

▲ Photo patterns at vantage points in London that are protect-
ed by the London View Management Framework (LVMF)

USER PER TIME OF DAY

3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
						79	120	187	254	289	305	333	297	180	134	111	107	89			

Primrose Hill Summit (London)

3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	52	45			51	62	108	147	182	198	189	185	238	206	229	225	225	200	147	135	88

CN Tower (Toronto)

USER PER WEEKDAY

Mon	Tue	Wed	Thu	Fri	Sat	Sun
	194	211	196	248	486	477

Primrose Hill Summit (London)

Mon	Tue	Wed	Thu	Fri	Sat	Sun
	296	268	301	339	433	370

CN Tower (Toronto)

USER PER MONTH

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
151		171	217	205	202	216	210	168	157	130	

Primrose Hill Summit (London)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
124		140	156	219	217	274	298	226	197	131	

CN Tower (Toronto)

▲ Temporal activity patterns at different locations,
extracted from photo time stamps

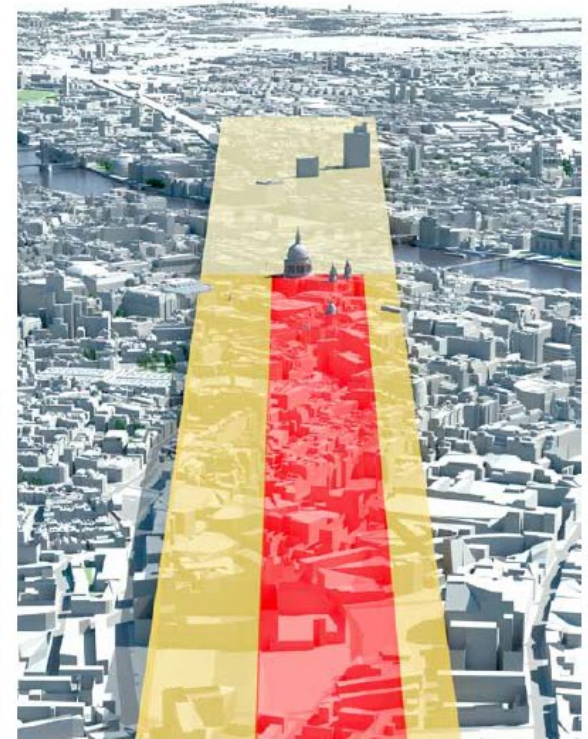# ASSESSING INTERACTION/ ACTIVITY PATTERNS FROM CROWSOURCED PHOTO DATA
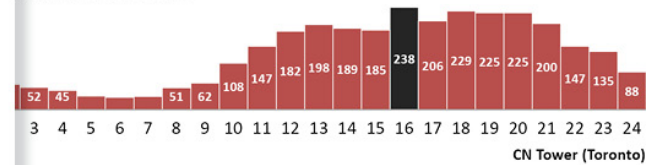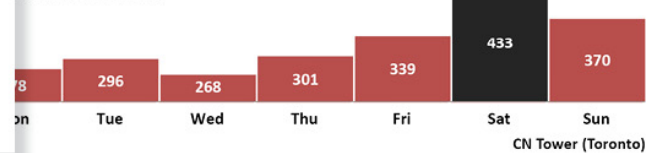
Protected Vista from Assessment Point 2A.1
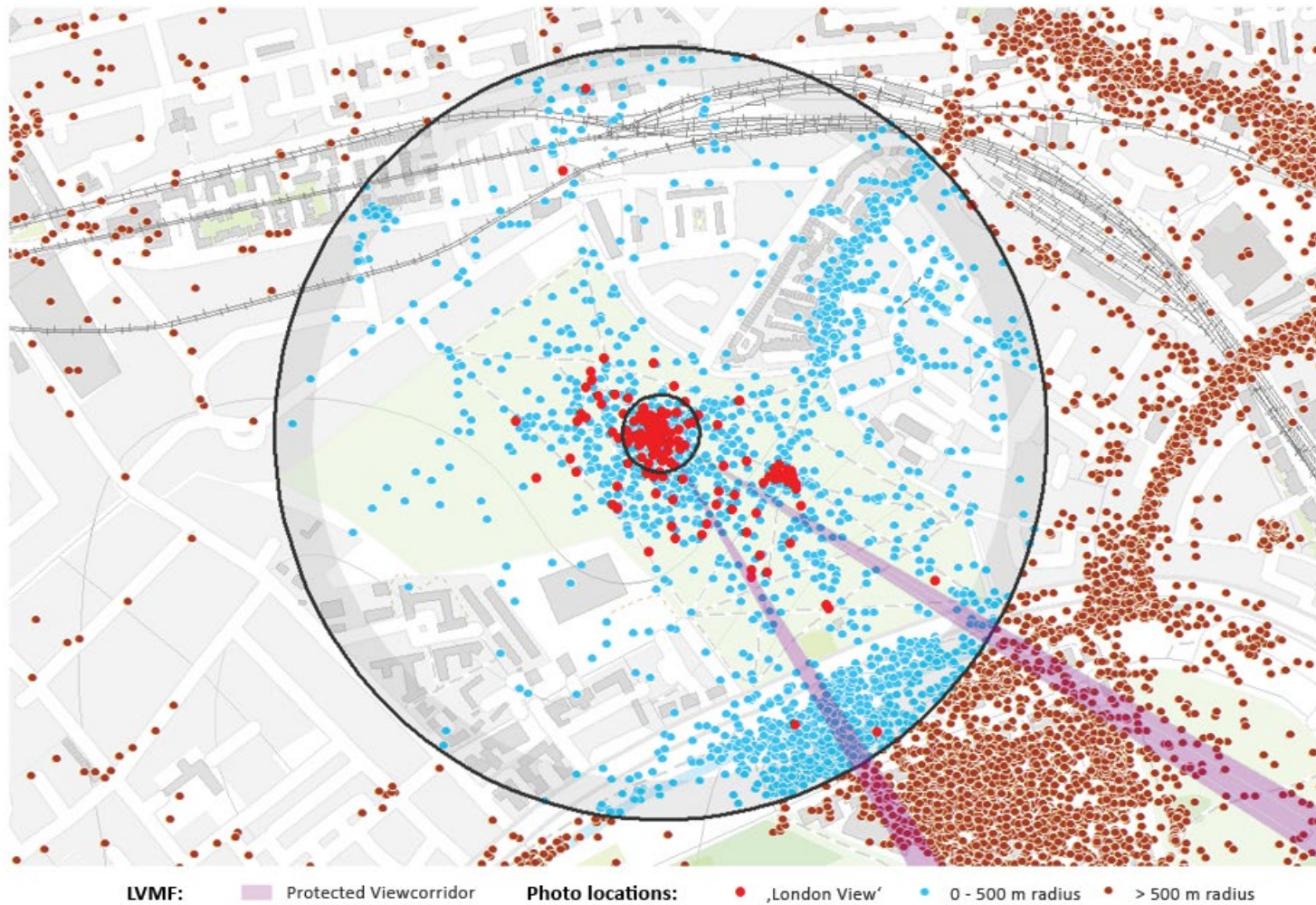from: Parliament Hill: the summit – looking toward St Paul's Cathedral
to: St Paul's Cathedral

London View Management Framework (LVMF)

LVMF: ▨ Protected Viewcorridor   Photo locations: ● ‚London View' ● 0 - 500 m radius ● > 500 m radius

Primrose Hill Summit

London View Management Framework (LVMF)

Who:

Representativeness

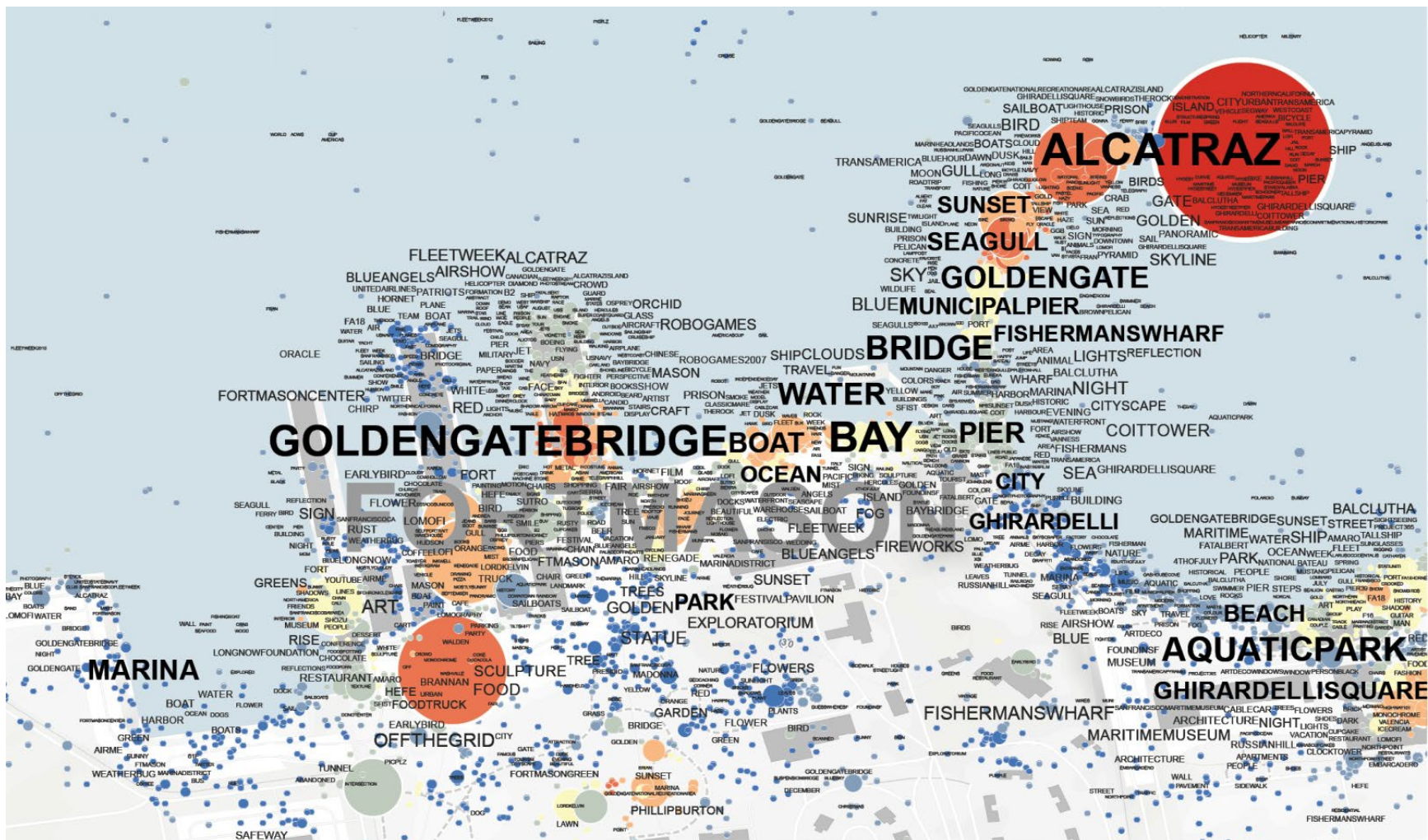**"Bias of Information"**

Bias

Americans

Europeans

a.

Photos:	17,986,848
Users:	291,338
Total # of Tags:	123,971,590
Distinct # of Tags:	2,791,309

b.

Photos:	733,401
Users:	8,081
Total # of Tags:	5,813,215
Distinct # of Tags:	235,469
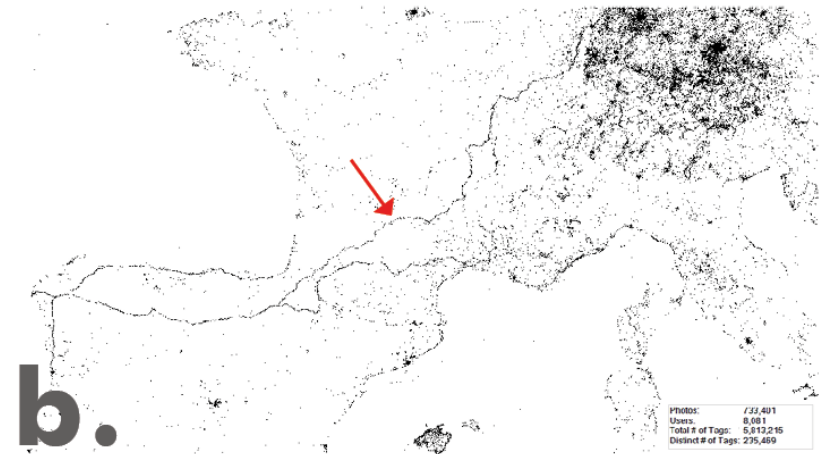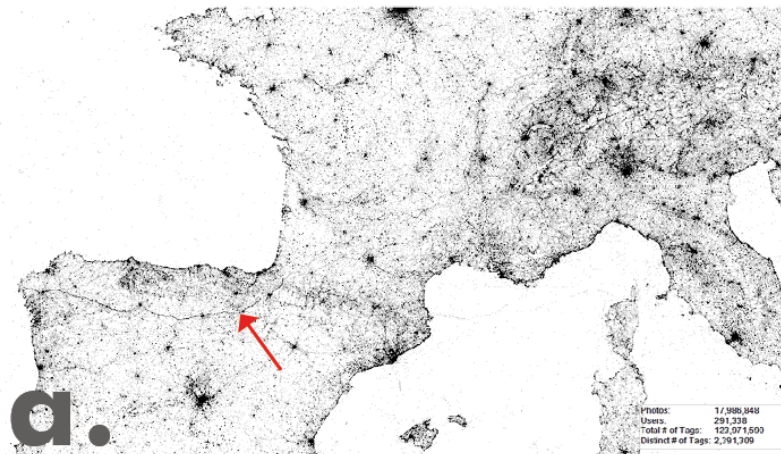
Camino de Santiago

Attribution of meaning:

Tags

Spatio-temporal Tag Clouds
(or "Tag Maps")

Distribution of Photos

Second Level Clustering:
Color
Hot-Spot-Analysis

< -0.80
-0.80 - -0.40 } Significant Cold Spots
-0.39 - 0.0

Z-Score Range*
0.1 - 2.0
2.1 - 4.0
4.1 - 6.0 } Significant Hot Spots
> 6.0

First Level Clustering:
Size
Number of Photos*

1
5
10
20
> 50

Distribution of Tags

Font Size:

Number of occurrences:*

fortmason — 1
fortmason — 10
fortmason — 50
fortmason — 100
fortma — > 200

Font Weight/ Color:

Light-grey color/ shown in background for most used tags:

fortmason

Bold font weight for the densest area for each tag used:

fortmason

Normal font weight for all other values:

fortmason
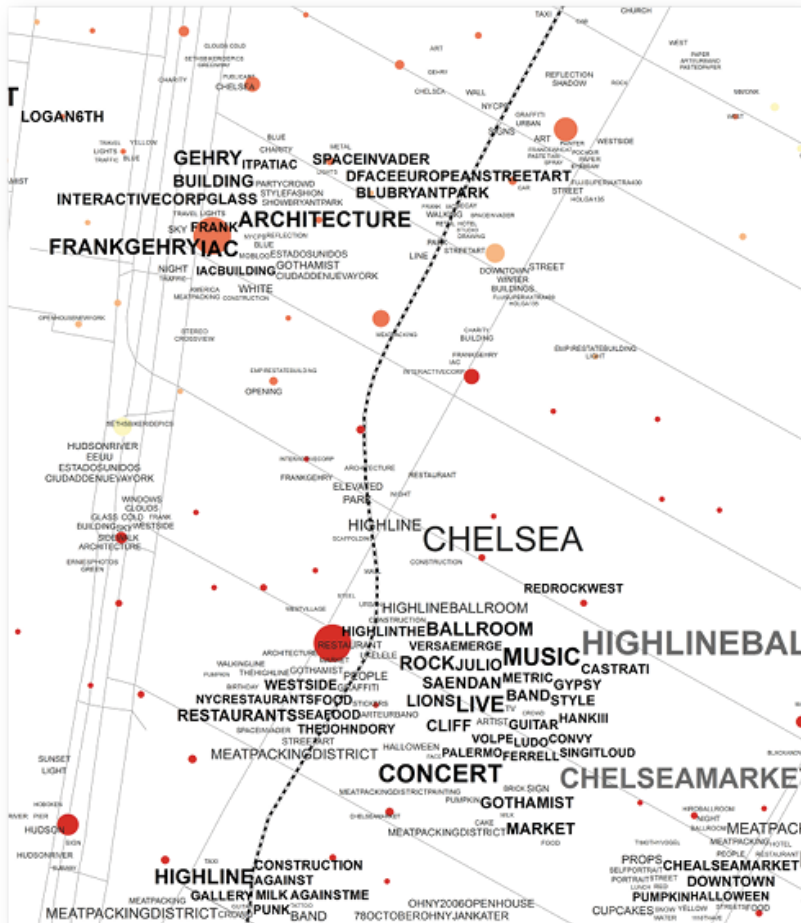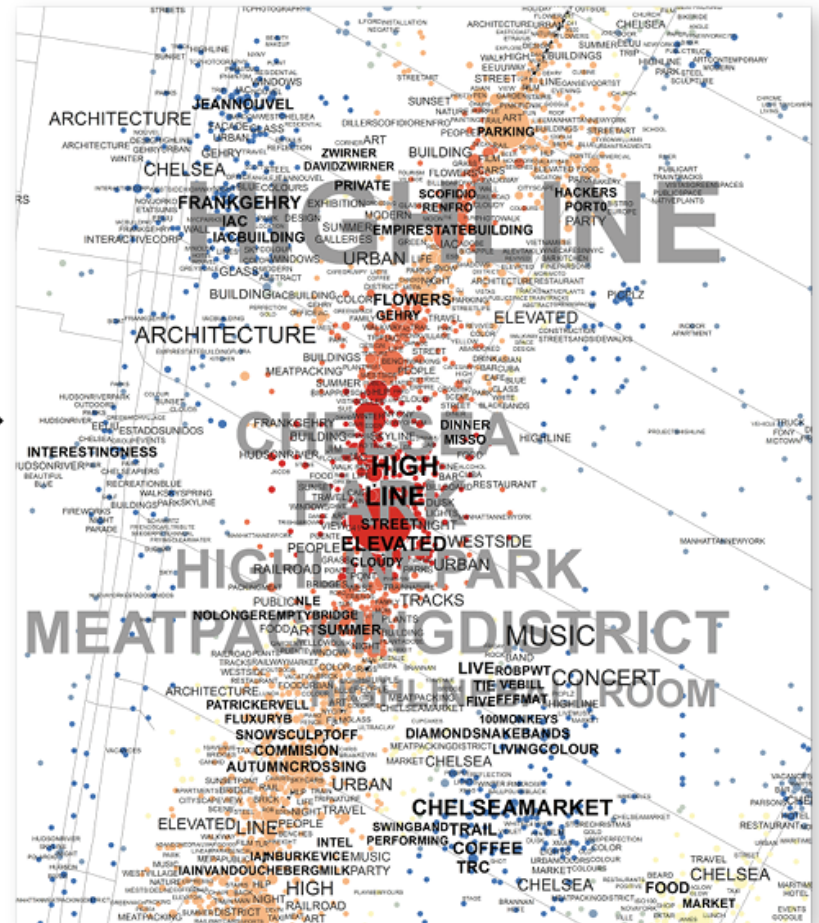
* Values vary

0   50   100   200 Meters

Time-based filtering:
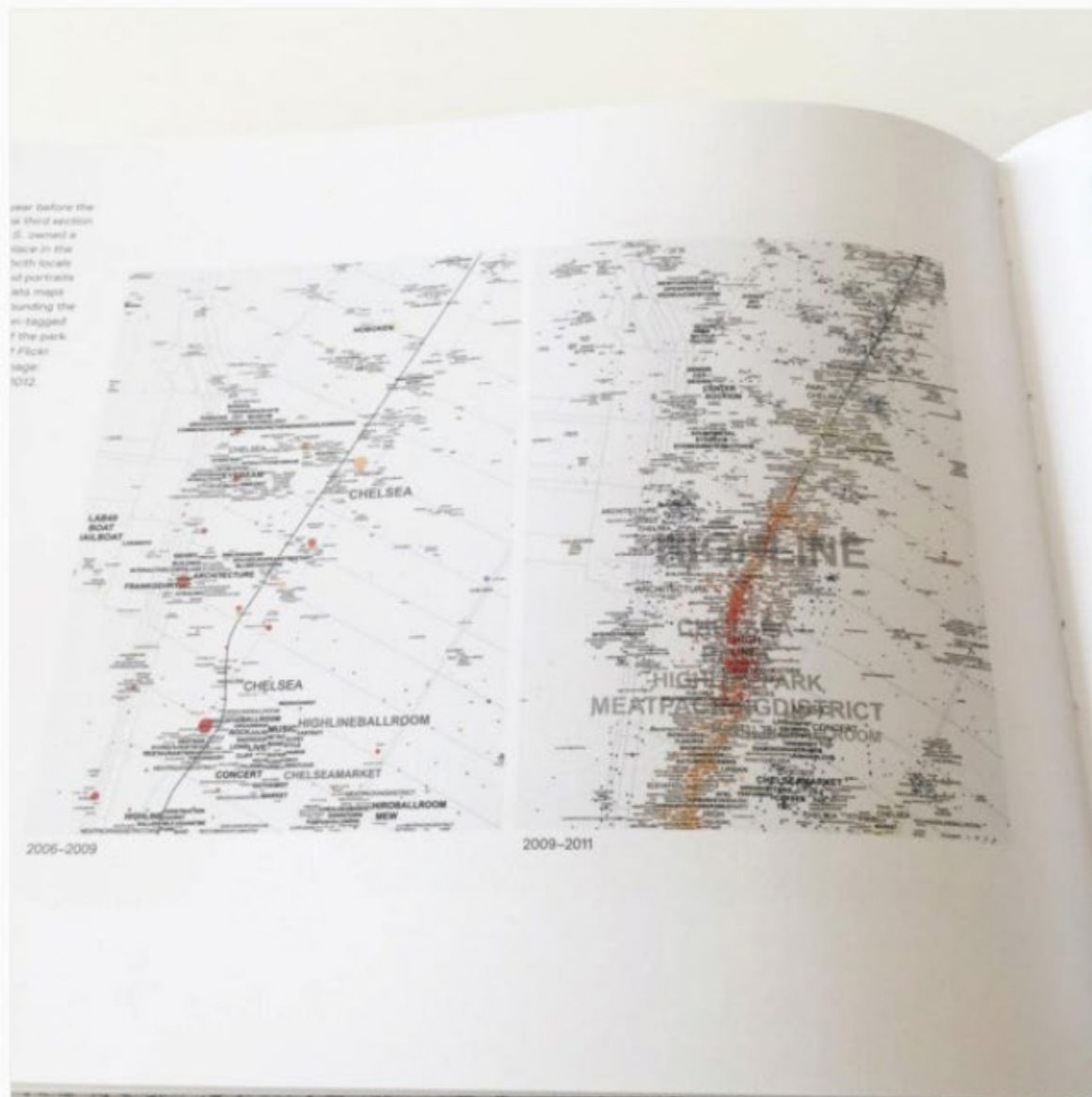
Monitoring

2006-2009

2009-2011
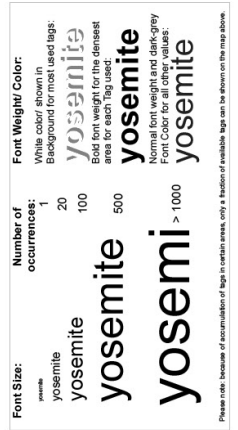
a

fieldoperations — FOLGEN

Gefällt 112 Mal   5Wo.

fieldoperations This High Line book is out! One last look, at the last chapter. Order link in bio, and @phaidonsnaps Today: 07_Unforeseen

Once built, the High Line quickly became an icon and a symbol of NYC, its level of popularity taking us a bit by surprise! This chapter explores the many unforeseen aspects of the High Line, ranging from the different ways people use it, to its economic impacts, to how it has influenced other cities' approach infrastructure reuse. The two maps above, by Alexander Dunkel, show the spike in Flickr photos taken on the High Line before and after Phase 1's opening in 2009. @highlinenyc and continues to skillfully guide the High Line's everyday operations, maintenance, art, and programming, ensuring it strikes a balance between popular destination
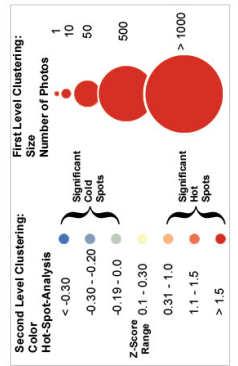
Melde dich an, um mit „Gefällt mir" zu markieren oder zu kommentieren.

PEOPLE'S ATTRIBUTION OF MEANING VISUALIZED
THROUGH LANDSCAPE PHOTOGRAPHY
FOR YOSEMITE VALLEY

Distribution of Tags

Distribution of Photos

Yosemite Valley

Dunkel, A. (2012)

HALFDOME

ELCAPITAN

GLACIERPOINT
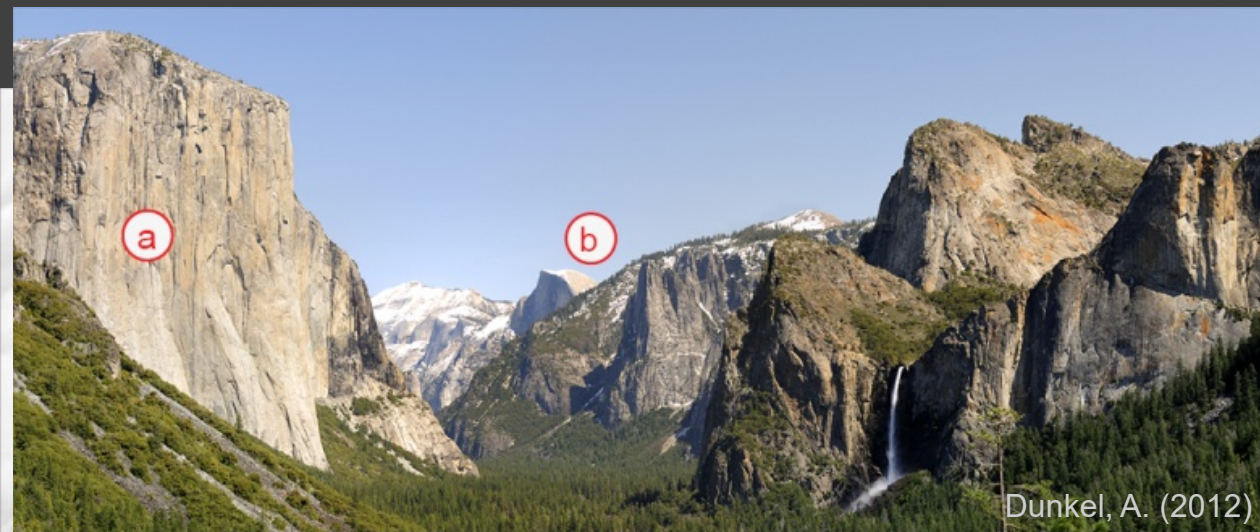
→ Meaning of a place as a **subject** compared to its meaning as a **vantage point**

Application Framework

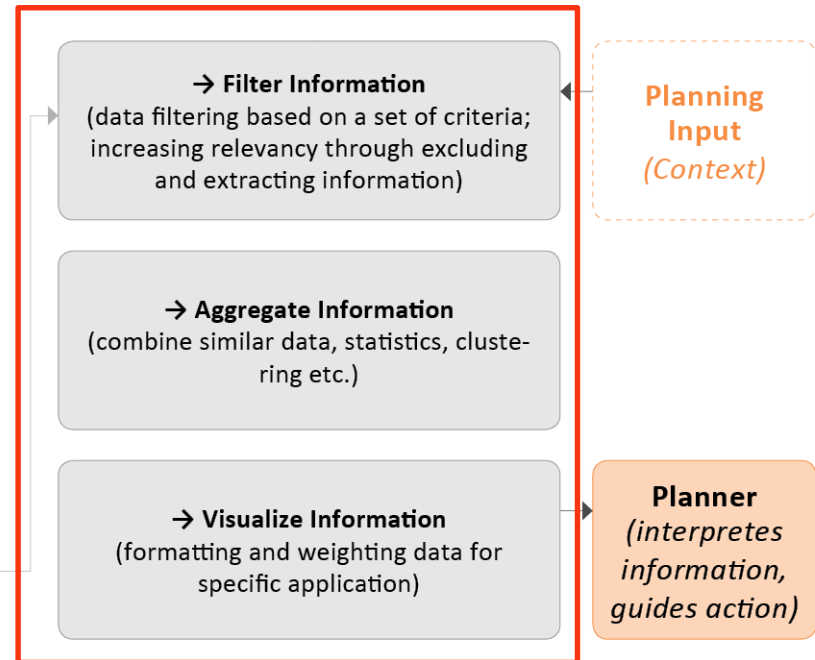Data generation (VGI)   Visualization & Evaluation
          ∧   ∧
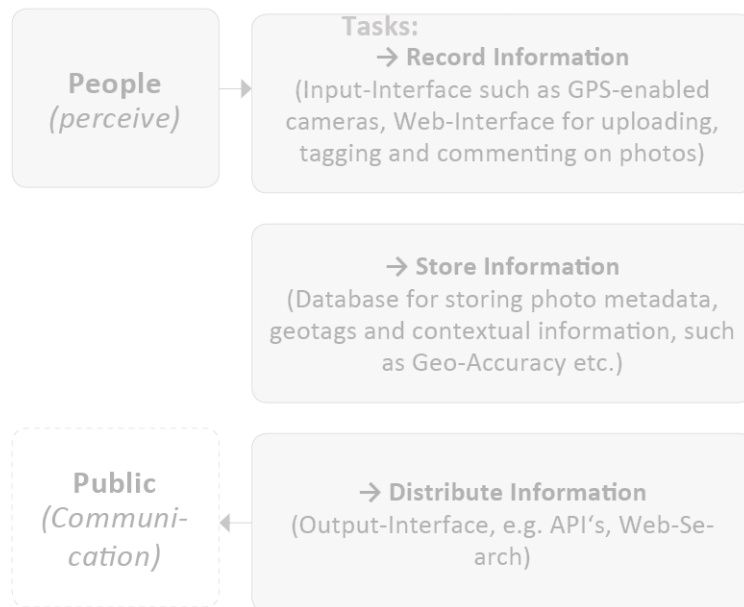
Actor   Technology Agent   Technology Agent   Actor

People
(perceive)

Tasks:
→ Record Information
(Input-Interface such as GPS-enabled cameras, Web-Interface for uploading, tagging and commenting on photos)

→ Filter Information
(data filtering based on a set of criteria; increasing relevancy through excluding and extracting information)

Planning Input
(Context)

→ Store Information
(Database for storing photo metadata, geotags and contextual information, such as Geo-Accuracy etc.)

→ Aggregate Information
(combine similar data, statistics, clustering etc.)

Public
(Communi-cation)

→ Distribute Information
(Output-Interface, e.g. API's, Web-Search)

→ Visualize Information
(formatting and weighting data for specific application)

Planner
(interpretes information, guides action)

EvaVGI

Vielen Dank