

Freedom in Geographical Information Systems

Ganesh

Trying to be an Independent Researcher, Hacker & Activist

✉ **geoneo**

≈ **vu3ygg**

✉ **31gane@gmail.com**

January 2, 2017

License

This document is licensed under Creative Commons NC ND 4.0.

This document represents mostly my thoughts, research, experiences and references
to other creative works.



Read the CC NC ND 4.0 License Deed [here](#)

Read the CC NC ND 4.0 Legal Code [here](#)

Overview

Inspiration

What is GIS ?

Cartography & Maps

Carto-Cube

Projection & Truth

Shape

Projection

Problem is ...

Organized Diversity

Modality

Remixxxx... & Disruption

Flow of Information

Conventional Way

Commons Collaborative Way

Grass-root Emergent Way

Arming the Commons'

What are the general needs ?

Data - Availability & Accessibility

Availability of Free & Open - Tools

Knowing Data & Tools

Connecting Data & Tools



whaaaazzz up human ?

Good or Bad or Neutral ?

technology

is

neither *Good*

nor *Bad*

not even *Neutral*

Melvin Kranzberg

people inspire people



these *dudes* somehow inspired me to learn & do Geo(G/IS)

locally these folks continues to inspire me by their silent actions... :)



+ all Open Mappers' & GIS'ers out there !

?

what is gis anyway

one of the interesting ways

"to look"

at things happening in

Earth

(present World)

GIS = Geo Systems + Information Systems

which is a *psychedelic* mix of :

- ▶ theories
- ▶ tools
- ▶ information
- ▶ methods
- ▶ strategies

from both the domains

a collaborative scientific process associated with geographical systems to
collect data, analyze, disseminate, share, distribute information
adhering to open standards

gis proliferates and promulgates a democratic and romantic relationship
between man, machine, and earth to reach a positive emergence

So What ?

well !... we have limitations

- ▶ senses
- ▶ perception
- ▶ reliable data collection
- ▶ repetitive & concurrent analysis
- ▶ modeling & repetitive reporting

Mapssssss !

What are Maps ?

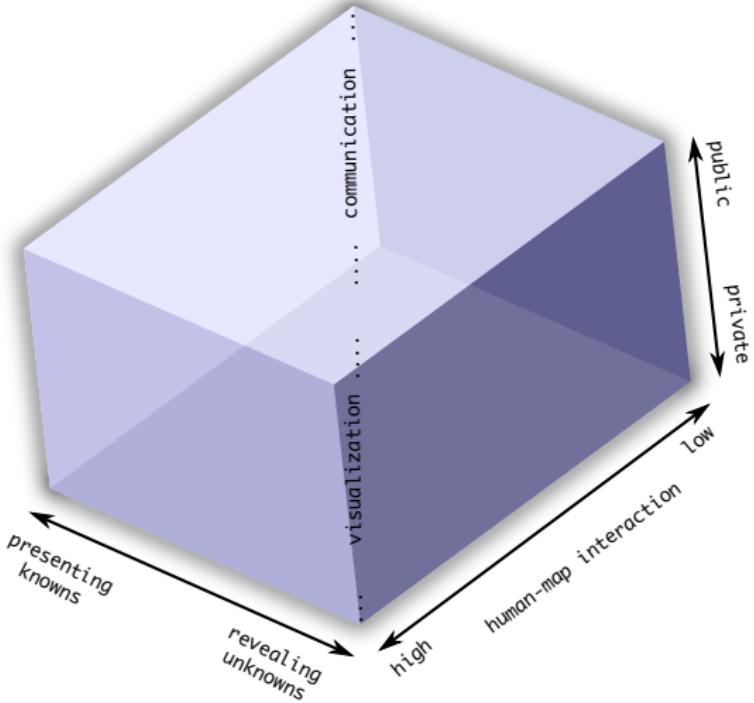
the **medium** through which geographically representable information is
shared and disseminated

What is Cartography ?

the art & way of designing maps effectively

= science + aesthetics + technique

Carto-Cube



Reference : cartography cube

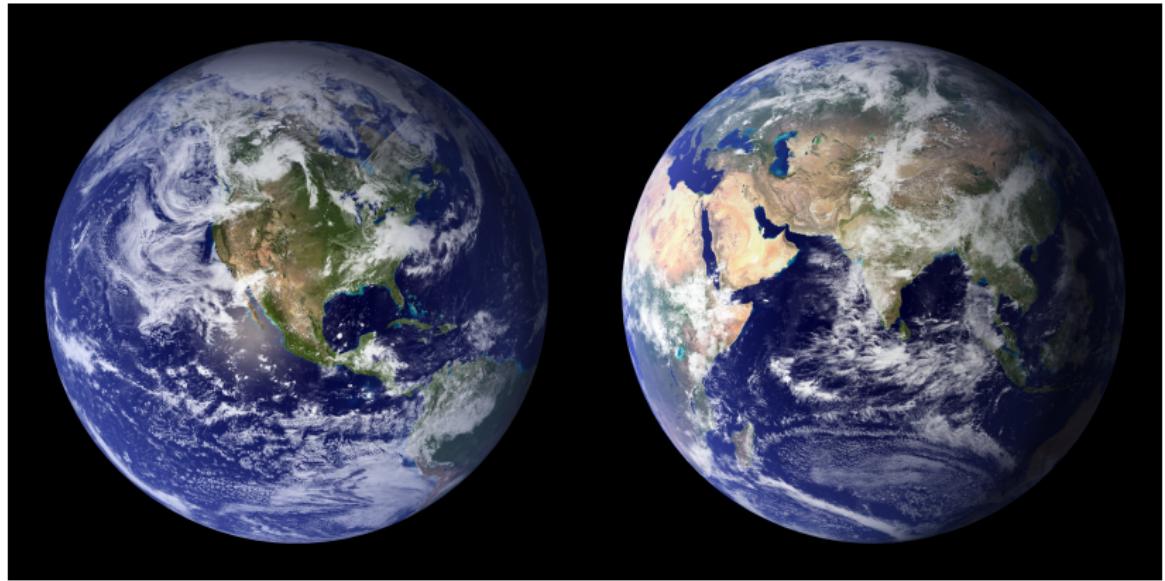
Projected Representation

What is True,

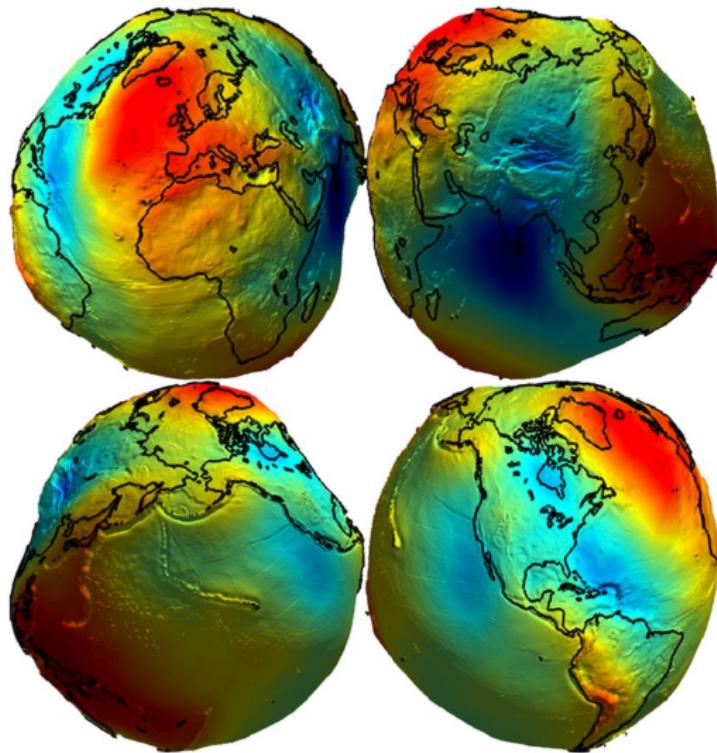
What is False,

Or .. Something in between ?

is it a spheroid ?



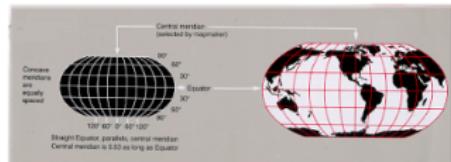
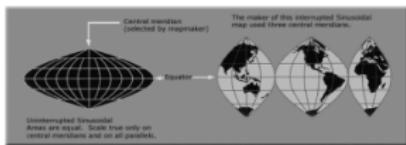
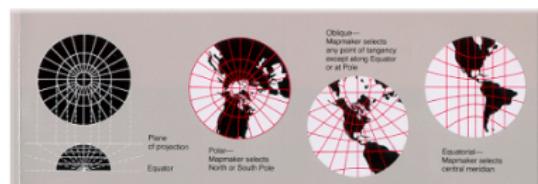
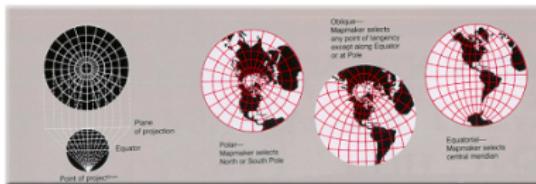
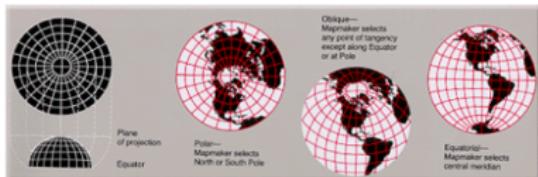
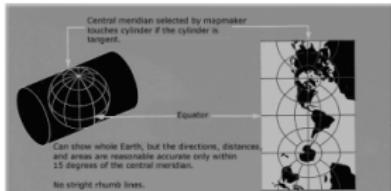
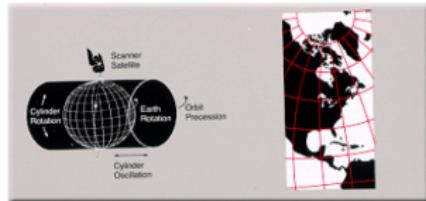
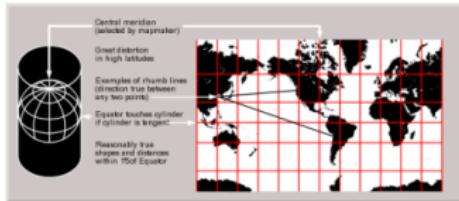
is it a geoid ?



Projection

Metric Properties = f (area, shape, direction, distance)

models always results in some form of distortion



Reference: [GIS wiki - Map Projections](#)

The True Size of Africa

A small contribution in the fight against rampant *Immappancy*; by Kai Krause

Graphic layout for visualization only (some countries are cut and rotated)
But the conclusions are very accurate: refer to table below for exact data

COUNTRY	AREA x 1000 km ²
China	9.597
USA	9.629
India	3.287
Mexico	1.964
Peru	1.285
France	633
Spain	506
Papua New Guinea	462
Sweden	441
Japan	378
Germany	357
Norway	324
Italy	301
New Zealand	270
United Kingdom	243
Nepal	147
Bangladesh	144
Greece	132
TOTAL	30.102
AFRICA	30.221



In addition to the well known social issues of illiteracy and innumeracy, there also should be such a concept as "*immappancy*", meaning insufficient geographical knowledge.

A survey with random American schoolkids let them guess the population and land area of their country. Not entirely unexpected, but still rather unsettling, the majority chose "1-2 billion" and "largest in the world", respectively.

Even with Asian and European college students, geographical estimates were often off by factors of 2-3. This is partly due to the highly distorted nature of the predominantly used mapping projections (such as Mercator).

A particularly extreme example is the worldwide misjudgement of the true size of Africa. This single image tries to embody the massive scale, which is larger than the USA, China, India, Japan and all of Europe.....combined!

Top 100 Countries

Area in square kilometers, Percentage of World Total
Sources: Britannica, Wikipedia, Almanac, 2010

Rank	Country	Area, km ²	%
1	Russia	17,098,342	9.15
2	Canada	9,985,613	4.75
3	China	9,395,961	4.45
4	United States	9,239,091	4.43
5	Brazil	8,515,750	3.75
6	Australia	7,692,024	3.52
7	Germany	3,287,363	2.35
8	Argentina	2,959,342	1.79
9	Kazakhstan	2,724,908	1.85
10	Bolivia	2,659,413	1.65
11	Algeria	2,636,730	1.65
12	Congo	2,344,968	1.60
13	Greenland	2,190,866	1.55
14	Uganda	2,180,500	1.47
15	Mexico	1,964,375	1.35
16	Indonesia	1,953,240	1.36
17	Syria	1,953,240	1.36
18	Iran	1,628,756	1.13
19	Mongolia	1,584,706	1.12
20	Malta	1,582,705	0.84
21	Chad	1,284,006	0.86
22	Hungary	1,287,706	0.85
23	Armenia	1,281,006	0.85
24	South Africa	1,281,006	0.83
25	Kenya	1,241,748	0.82
26	Eritrea	1,134,206	0.75
27	Ethiopia	1,096,951	0.76
28	Mauritania	1,082,006	0.68
29	Egypt	1,082,006	0.67
30	Uzbekistan	1,073,798	0.62
31	Malta	925,798	0.54
32	Venezuela	925,059	0.61
33	Namibia	857,000	0.54
34	Mozambique	856,986	0.54
35	Pakistan	856,986	0.54
36	Tunisia	798,096	0.53
37	Liberia	798,102	0.51
38	Zambia	782,612	0.51
39	Myanmar	782,612	0.51
40	Albania	697,096	0.44
41	Senegal	697,097	0.43
42	Peru	697,097	0.43
43	C. African Rep.	682,994	0.42
44	Ukraine	683,504	0.41
45	Montenegro	683,504	0.41
46	Maldives	682,994	0.41
47	Brunei Darussel	682,994	0.41
48	Keeps	580,367	0.38
49	Yemen	580,367	0.38
50	Thailand	581,126	0.34
51	Spain	585,966	0.34
52	Turkey	482,942	0.32
53	Cameroun	479,442	0.32
54	Papua New Guinea	482,944	0.31
55	Uganda	482,944	0.31
56	Uzbekistan	446,558	0.31
57	Sweden	441,379	0.31
58	Iran	441,379	0.31
59	Paraguay	499,792	0.27
60	Zimbabwe	380,757	0.26
61	Angola	380,757	0.26
62	Germany	382,114	0.24
63	Rep. of Congo	342,006	0.23
64	Uganda	342,006	0.23
65	Vietnam	331,212	0.22
66	Malaysia	330,803	0.22
67	Uganda	327,963	0.22
68	Côte d'Ivoire	327,963	0.22
69	Poland	312,688	0.21
70	Costa Rica	312,688	0.21
71	Italy	301,338	0.21
72	Philippines	300,006	0.20
73	Botswana	297,967	0.19
74	New Zealand	270,467	0.19
75	Qatar	287,958	0.18
76	Weakland	287,958	0.18
77	Ecuador	250,369	0.20
78	Greece	245,957	0.17
79	United Arab Emirates	245,957	0.17
80	Uganda	241,039	0.18
81	Ghana	236,539	0.18
82	Kenya	236,539	0.18
83	Leso	236,800	0.18
84	Guinea	214,968	0.14
85	Bangladesh	214,968	0.14
86	Kyrgyzstan	199,951	0.13
87	Senegal	186,722	0.13
88	Uganda	186,722	0.13
89	Cambodia	181,038	0.12
90	Uganda	176,316	0.11
91	Saint Lucia	176,316	0.11
92	Turkmen	165,610	0.11
93	Nepal	147,161	0.11
94	Bangladesh	147,161	0.11
95	Tajikistan	143,108	0.10
96	Greece	131,967	0.09
97	Malta	131,967	0.09
98	North Korea	120,536	0.08
99	Malta	116,444	0.08
100	Timor	117,609	0.08

TOP 100 TOTAL: 182,932,234 69.34

well, –

Essentially, all models are wrong, but some are useful.

George E.P. Box

Diversity :)

Organized Diversity

ontological, theoretical



knowledge organization



modalities

measurement & data collection



processing, analysis



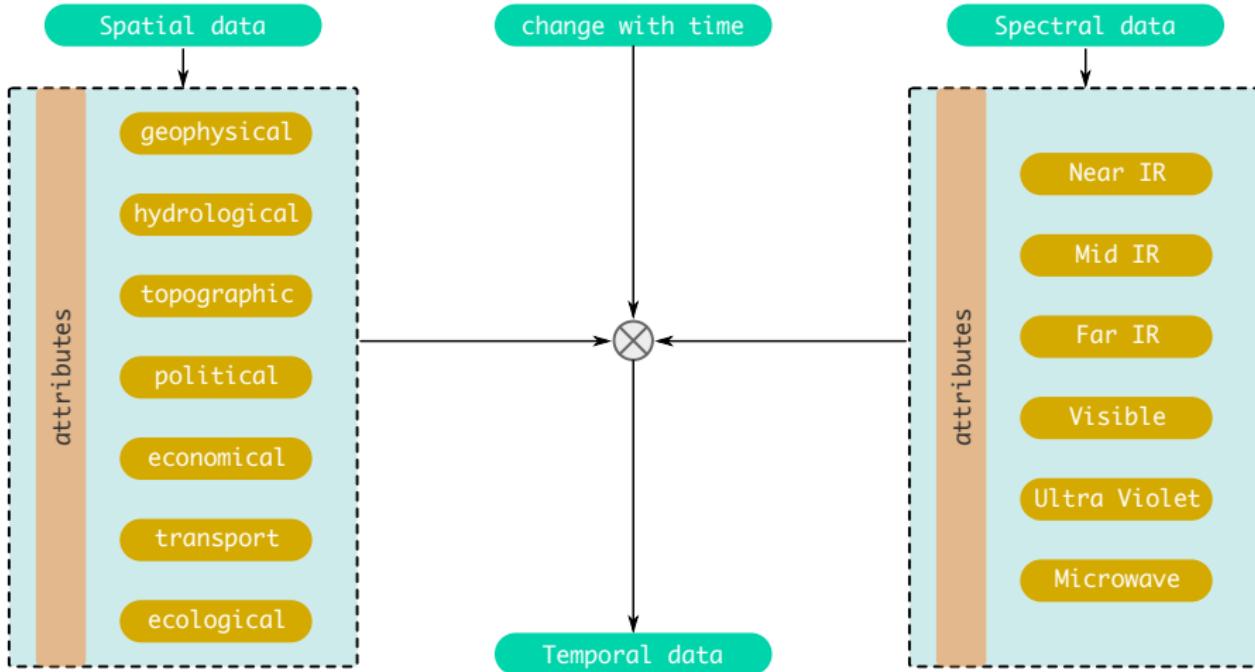
attributes

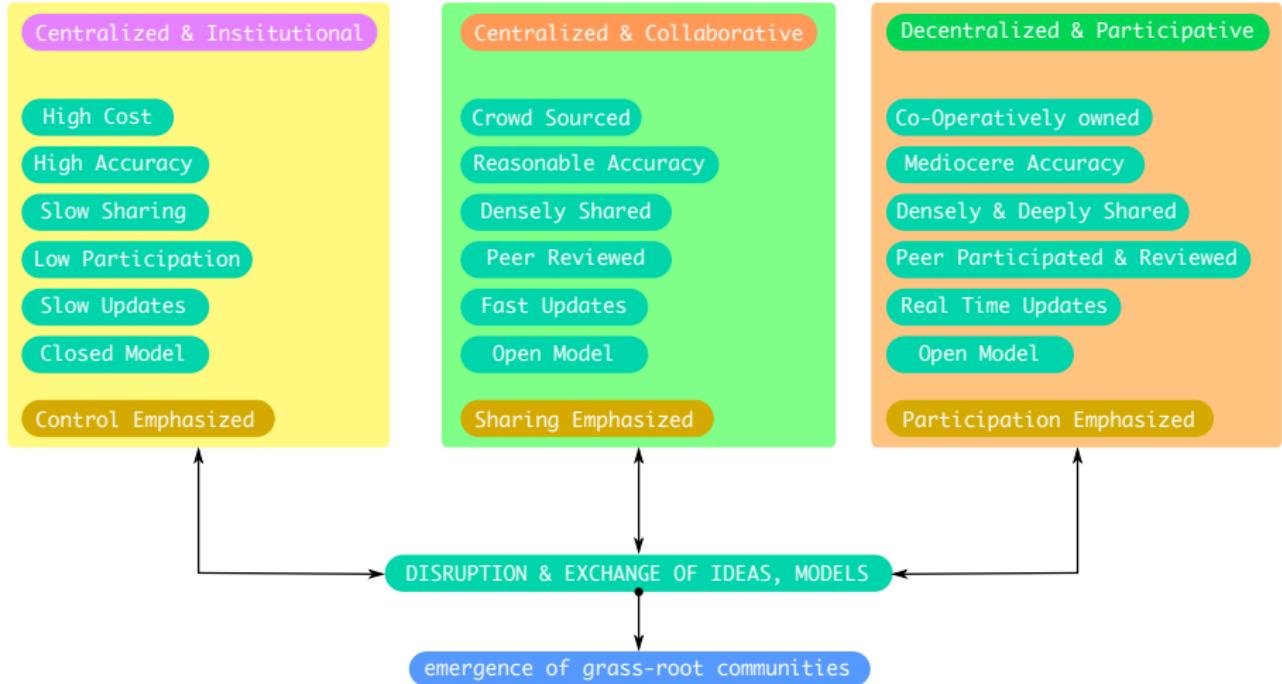


dimensions



visualization





How does Info. Flow ?

Once upon a time ...

THE
PICTORIAL
MISSIONARY MAP
OF THE
WORLD



PICTORIAL MISSIONARY MAP OF THE WORLD
BY JOHN BROWN & CO., BOSTON.
PRINTED IN U.S.A. BY THE AMERICAN PRESS.
1870.

London: JAMES DODD & CO., 1870. Price 25s. Postage, 6d. 160 Plates. Printed on the one side.

PRINTED AND PUBLISHED BY JOHN BROWN & CO.

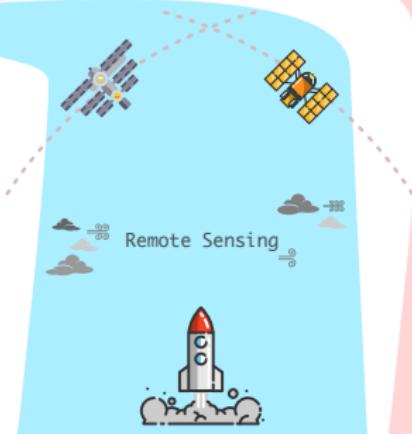
the conventional way ...

Establishments

Institutions



Surveying



Remote Sensing



Dissemination



it is centralized too !

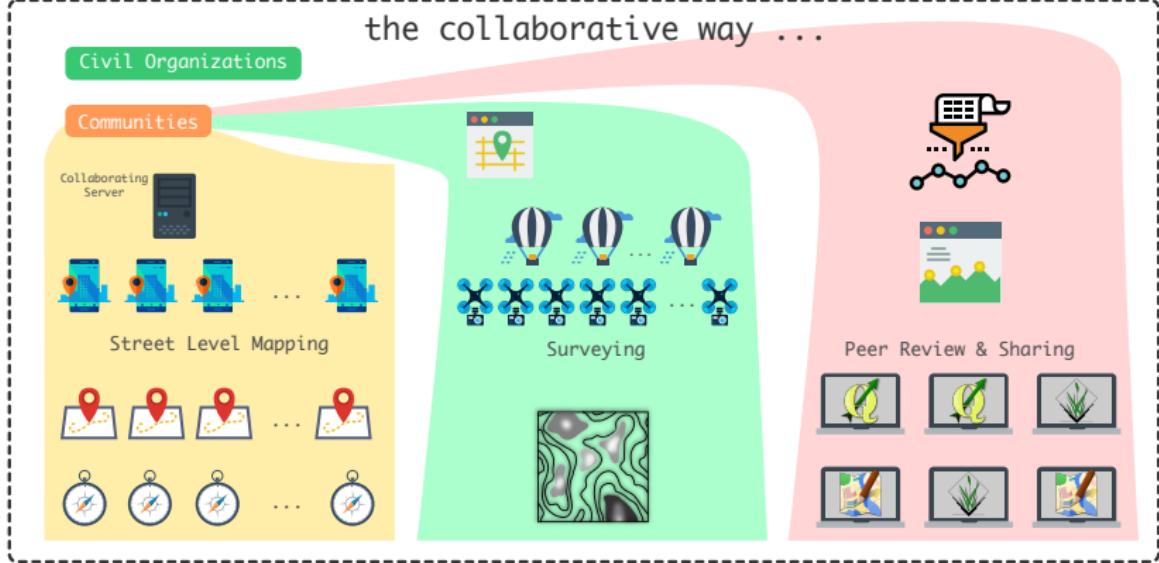
resulted in maps like these..... !



meanwhile, rise in ...

education, science, technology & creative commons ...

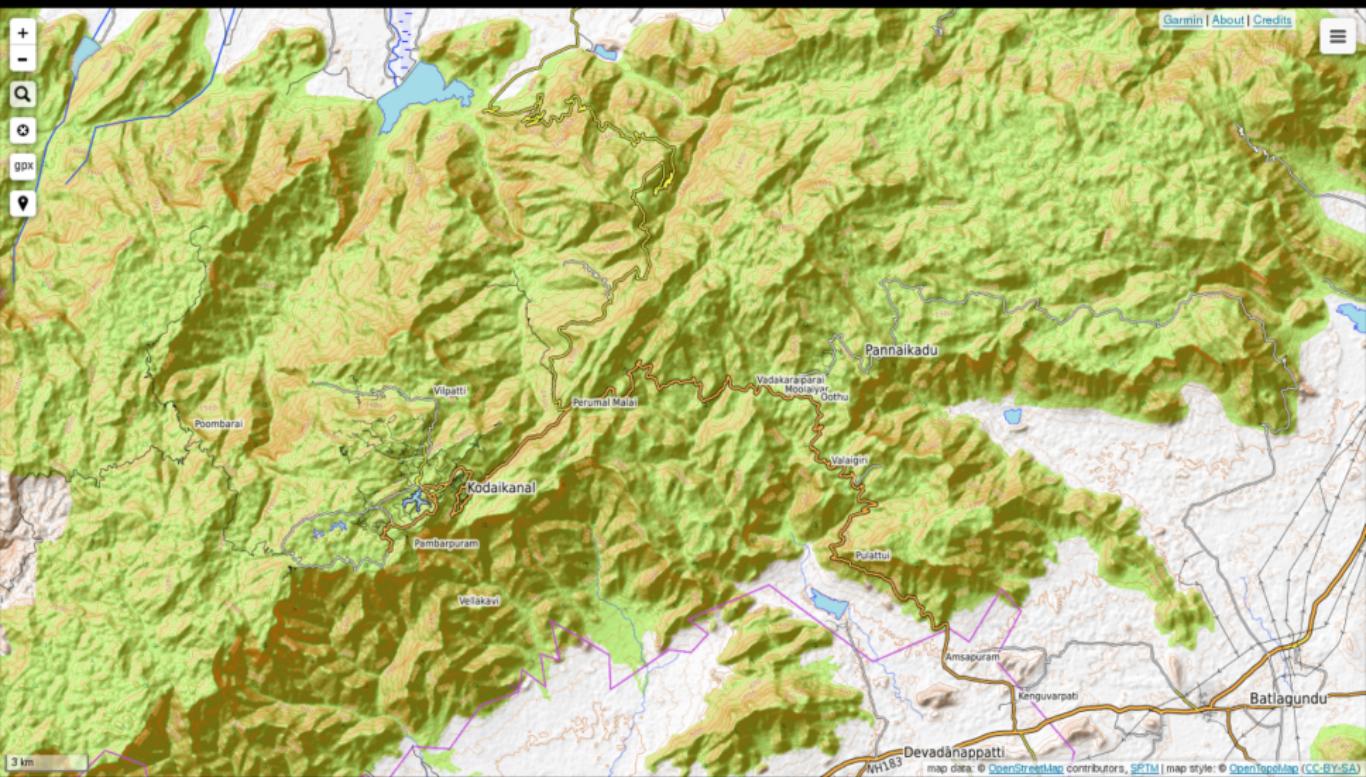
the collaborative way ...



partially centralized but collaborative (decentralized):

existing infrastructure + creative commons + opendata + internet

resulted in maps like these..... !



with emergent grass root infrastructure

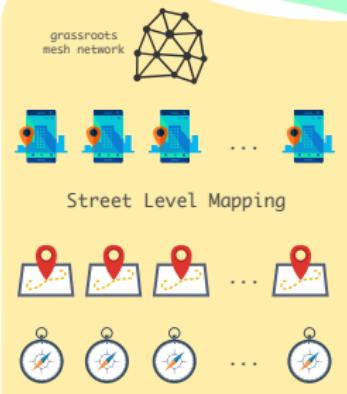
&

commons based peer production ...

the grassroots way ...

Emergent Communities

Networks



Surveying



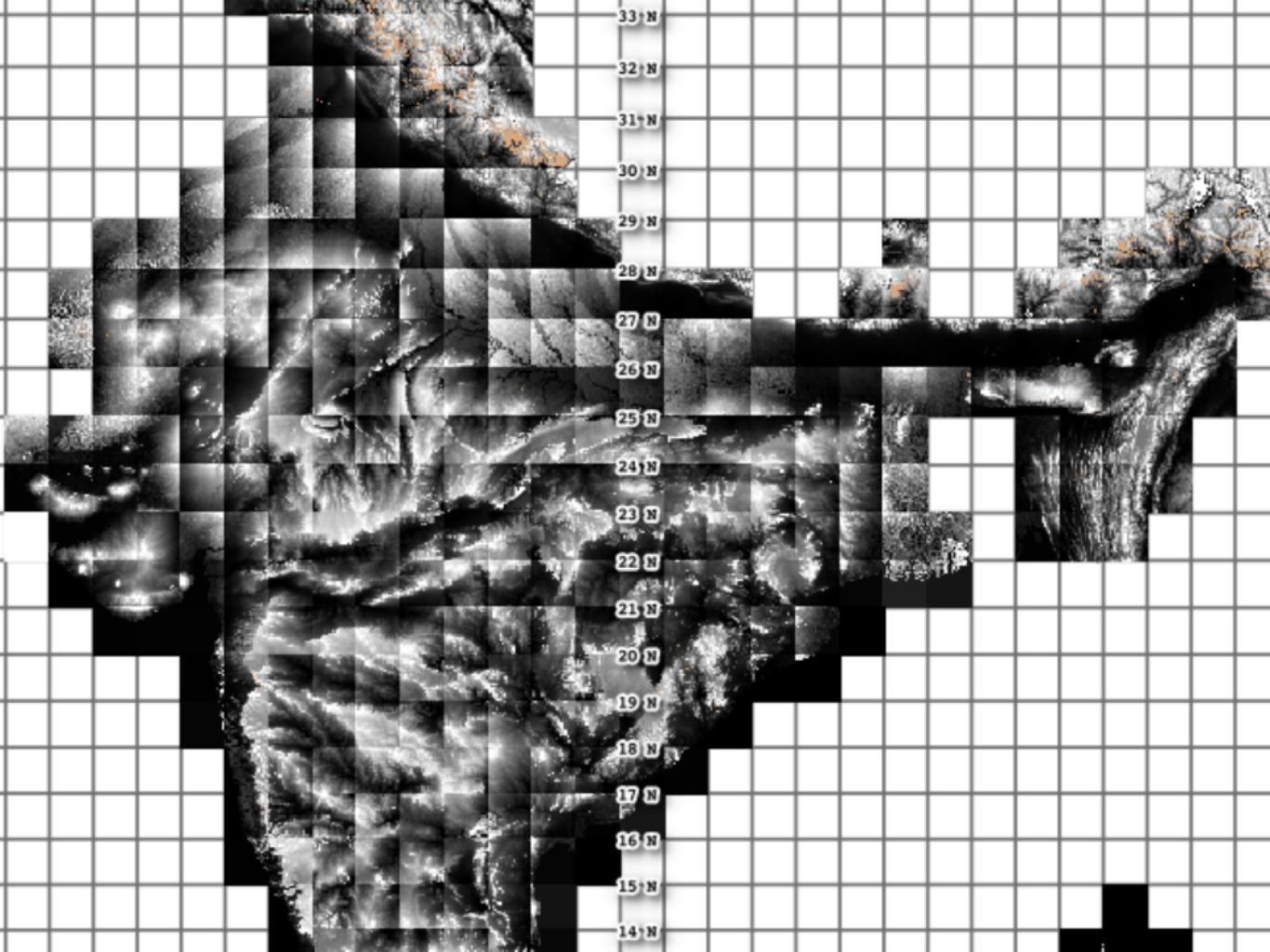
Peer Review & Sharing



meshed grassroots :

existing infrastructure + creative commons + opendata + grass-roots emerged internet

will create more than these..... !





Enoughhhh...
Let us Know the Needs

general needs :



Open Community

Collaboration, Cooperation, Peer Review

Open Licenses

Free to Use, Edit, Share, Distribute

Open Standards

Version Controlled, Scientific alignment

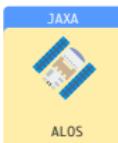
Open Tools

Transparency, Freedom to Share & Create

Open Data

what are accessible public data sources ?

Public Research Institutions



ALOS



IRS*



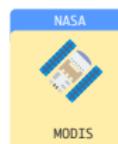
SENTINEL



SRTM



LANDSAT



MODIS

...



ASTER

Public - Data Access Portals

USGS Earth Explorer

USGS Eros Center

NASA EOSDIS

ESA Sentinel Scientific Data Hub

ESA Earth Online

JAXA EORC

⋮

ISRO - NRSC Bhuvan

institutional + crowd-collaborative public data sources ...



...



+ remixes

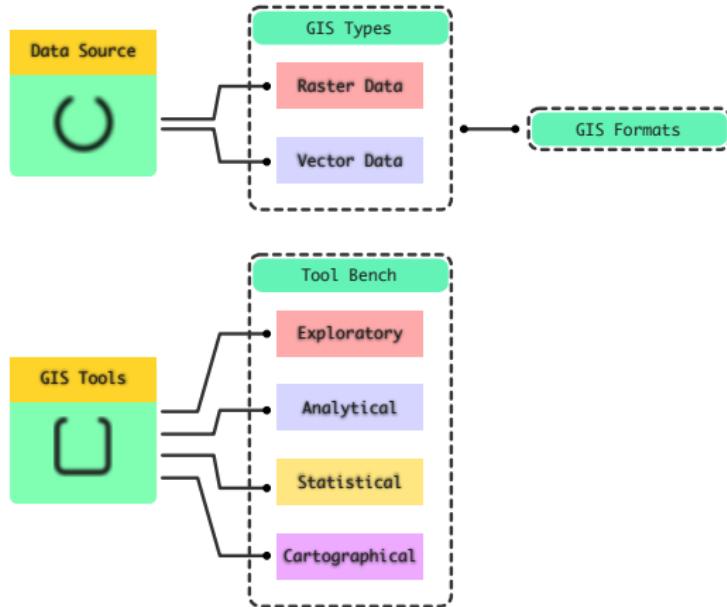
Free & Open Technologies/Tools :



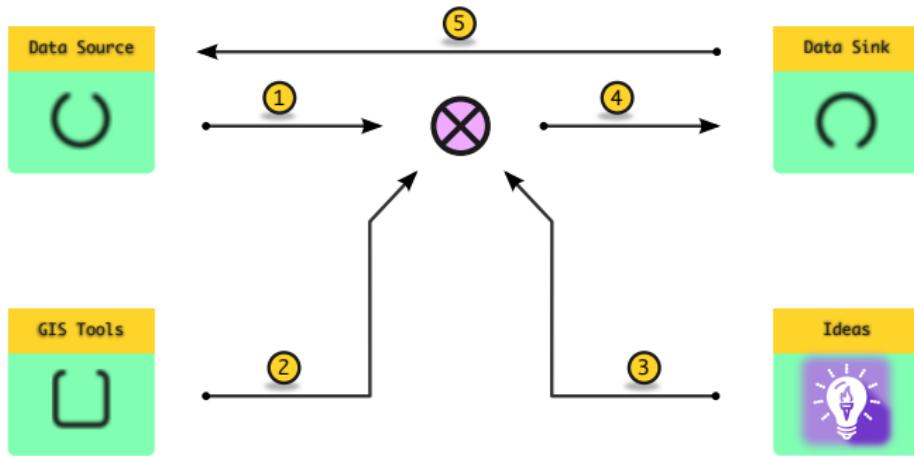
there's lot more
&
still innovating ... :)



Know the Organization - in general



Connections



Credits

This Document Contains contents, icons, taken from collaborative internet web sites which offer the content distributed under Public Domain or CC license.

Since every icons in each block diagram cannot be attributed separately
So i am providing the link where it can be from.



think !