1. Hello and good afternoon. Unfortunately, Chris could not come today so I am the sole voice of a much larger working group.
2. This work is based on the following premises: Unplanned urban development is a challenge to sustainable development.
3. And, world population trends show that more people live in cities. According to the UN this imbalance will continue to increase.
4. In this context I want to talk about urban participatory mapmaking in Las Flores of Barranquilla, Colombia. The purpose of this paper is to outline a framework for urban participatory mapping that includes Geography, Architecture, and Library and Information Science.

This is how the presentation will proceed.

1. Our work draws on several literatures that cross disciplinary boundaries.
2. Participatory mapping is largely based on work with first nations in Canada (Hugh Brody), Development work in Africa (Robert Chambers), and work in the Philippines (Harold Conklin). Property, territorial rights, self-determination, development.

There is also Jane Addams’ work in Chicago’s Hull House at the turn of the 19th century that some consider participatory. Perhaps even Bunge’s Detroit expeditions from the 1960s. These last two are great examples of early urban participatory mapping.

The PM approach is based on two assumptions: local knowledge is better for making maps, and the map making process is empowering for those that participate.

It is likely that the first statement is true, but the second is the subject of ongoing debate within the literature. As we know, maps and power are interrelated and this interrelation brings issues of knowledge and power, gender, who participates, who wins, who loses and most importantly who owns the map as an instrument of power.

1. In any case, in today’s technology context we also need to consider how participatory mapping and GIS come together: P/PGIS, online participation, vernacular mapping (open street map, etc). Is this a further turn to democratic mapping? In Latin America Social Cartography is becoming popular as a form of vernacular cartography: maps as performance in which non-cartographers are the principal actors.
2. Vernacular Architecture

The informal city can seem incomprehensible as it is largely a city perceived in motion- a three dimensional construct of incremental development.

1. They are compact with clearly delineated boundaries (either natural or manmade) and with very few points of entry.
2. The physical patterns are organic and irregular, adapting and developing over time as the needs and circumstances of the community change ...
3. Furthermore, while methods of construction are continuously evolving from less permanent materials ...
4. ... to more permanent materials, the urban pattern and the subdivision of land is remarkably resilient.

Indeed, theory indicates that the vernacular has much to offer in terms of sustainable development, appropriate use of materials, and so on. As Jackson tells, It is “identified with local custom, pragmatic adaptation to circumstances, and unpredictable mobility” (Jackson, 1984, p. xii).

Much of the literature on Vernacular Cartography values local knowledge: this resonates deeply with the first assumption found in participatory mapping.

1. Indigenous Data Governance

I have no images …. But ….

There is a rapidly growing literature on Indigenous Data Governance that is emerging from the CANZUS countries: Canada, Australia, New Zealand and the United States. It draws heavily from library and information science and focuses largely on health informatics and census data on First Nations people. Almost all of the work ties data governance to indigenous self-determination through the 2007 UN Declaration of the Rights of Indigenous Peoples (UNDRIP).

It raises the important questions – who should control information about indigenous groups and how is this control linked to self-determination?

There is a focus on Ownership, Control, Access and Possession (OCAP) of data, a term that emerged in the first decade of the present century.

As Raine notes: data on indigenous peoples is inconsistent, poor quality, irrelevant, produced and used in an environment of mistrust, and controlled by those who are not indigenous – this resonates deeply with indigenous mapping efforts.

In a similar vein, there are participation problems. Does participation empower or simply increase the digital divide? How can capacity be built to manage data from within indigenous organizations.

From information science, data governance includes the creation of a data repository. How is the data in a repository owned, licensed, shared, and accessed?

There is repeated emphasis on data sharing agreements between indigenous organizations and government offices – working collaboratively to develop information systems that allow for the management of OCAP.

In the context of academic research, most research institutions do not even have data policies and it is assumed that data is owned by the researcher, but this is not correct.

And finally, data is a valuable resource. It should come as no surprise that Elinor Ostrom writes of data as another common property resource … Again, there is resonance with common property and participatory mapping of indigenous rights.

1. Now we turn to some of the completed field work

The work is located Las Flores, an informal fishing settlement at the mouth of the Magdalena River on the Caribbean shore of Barranquilla, Colombia. Relationships within the community were developed through four years of architectural studios run by Adib Cure with support and collaboration of with a local business tecnoglass and its outreach organization la Fundacion Tecnoglass. Through this academic-private partnership stable relationships have been established with three local organizations: La Junta de Accion Comunal (JAC); La Associacion de Pescadors (Asopeflores); and El Frente Comun para el Desarrollo Social de Las Flores (FCLF).

1. Drone Surveys

Chris Mader uses an inexpensive quad-copter drone from 3drobotics equipped with a modified hero 4 gopro camera to conduct the aerial surveys (six in total so far).

1. 3D model

Amin Sarafraz used the open-source Visual Structure From Motion software (Visual SFM) to create two products from the aerial surveys. This technique utilizes photogrammetry to construct a three dimensional point cloud from collections of photographs. It recognizes similar pixels across many photos and uses the co-occurrences to construct the three dimensional model.

1. Once the model is created, further manipulation produces an orthographic image which can then be georeferenced using ground control points. This experimental methodology has produced stunning high resolution georeferenced images of the vernacular landscape in Las Flores.
2. Social Cartography

In February of 2017 Chris and I facilitated a community mapping workshop in Las Flores with participation from the leadership of the JAC, ASOPESFLORES, and the FCLF.

1. Over fifteen prioritized themes were identified and discussed. The discussion included privacy issues, limits of cartographic representational and storytelling, and an exploration of how mapping, property, and governance are related.
2. the community leaders choose eight of the identified themes and placed colored stickers on the aerial images based on their knowledge of Las Flores geography. The eight chosen themes were 1) security, 2) street lighting, 3) tourism locations, 4) schools, 5) health centers, 6) garbage problems, and 7) contamination.
3. After digitization the chosen themes showed emergent patterns on the map. The test was a success and a decision was made to move forward with more mapping work (none yet to date).
4. Students in the studio explore and experience Las Flores. Upon returning to the University of Miami they are required to do a project. What follows are some of the better examples.
5. This is a 3D model in wood of las flores – made by the group in one of Adib Cure’s studios – this could be used in the future as something reminiscent of P3DM – Giacomo Rambaldi’s participatory 3D modelling
6. Maps by undergraduate student Ana Luiza Leite showing various architecture themes: Building heights, road conditions …
7. Building material and land use
8. There are also student development projects informed by local experience
9. This student project informed by community input proposes a large communal hall as a shared space for a fish market, community meetings, and school gatherings.
10. Another student project proposes a public laundry space meant to serve community members with no running water.
11. This project plans for a communal fishery ...
12. So What? A framework to map the vernacular that draws on interdisciplinary experience.
    1. More Participatory mapping that draws from participatory mapping and vernacular architecture
       1. There is a planned survey in 2018-2019
       2. Themes will be identified and mapped by local leadership
       3. Building footprints, materials, construction, windows, services
       4. Property boundaries
       5. Pictures, videos and stories
       6. Always remember: who participates and how and who wins and who loses?
    2. Data governance board with the JAC, ASOPESFLORES, FCLF that draws from indigenous data governance and participatory mapping
       1. Membership will include, apart from local leadership, local business (TecnoGlass), and *Municipilidad de Barranquilla* (especially the GIS unit)
       2. Create data sharing agreements
       3. Create internal policies on data use
    3. P/PGIS as a repository with rights control and metadata policies implemented that draws on data governance and library and information science
       1. Multiple login levels depending on rights
       2. Process for data and metadata entry as data is captured through participatory process
       3. Process to approve data additions and assign levels of access
13. Conclusion
    1. There is much crossover between data governance, vernacular architecture, and participatory mapping efforts
       1. Local knowledge is better
       2. The ever elusive empowerment through participation
       3. Scott – seeing like a state (Scott 1988)
       4. Neoliberal conceptions of property
    2. There is a need to think about what happens after rights are gained
       1. Much participatory mapping focuses on rights as a product
       2. After rights comes governance: once property is defined, then what (Smith 2016)?
       3. Once it was who had control over the map – map or be mapped? Now it is who has the database, self-document or be documented (this includes geography).
14. There is an ever present danger when working with novel technologies. The technology is simply in search of a problem to solve (cd. Pickles 1995). At the same time, those who have access to and control over these technologies gain a position of power (hence empowerment through cartographic technology). This conclusion emerged from research on participatory mapping, critical GIS, and now it will likely emerge with continued research on novel GIS technologies, data governance, and information science. Those that have access to and control over the systems that feed internet based data portals and visualization tools will gain a positon of power. The academe, as part of the social system that drives the design and implementation of these digital systems in a so-called democratic society, has a responsibility to make these technologies as inclusive as possible.

Extra thoughts

* 1. Calls for more research
     1. Indigenous question – as migration increases, are the indigenous maps of the city? Think Raymond Williams (1973)
     2. What benefits to the local community from social cartography combined with a P/PGIS can be measured? (Corbett and Keller 2005)
     3. What novel storytelling mechanisms will emerge?
     4. Differences between mapping the vernacular and vernacular mapping (Gerlach 2014)?
     5. Links between c*artografia social* and property rights?