Identifying Elements at Risk from OpenStreetMap: The Case of Flooding

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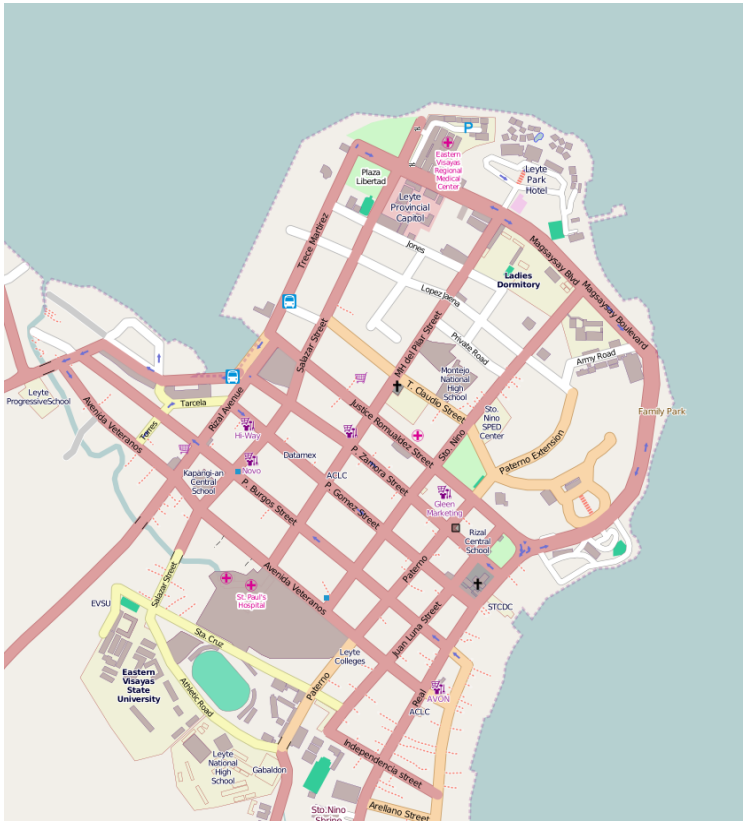
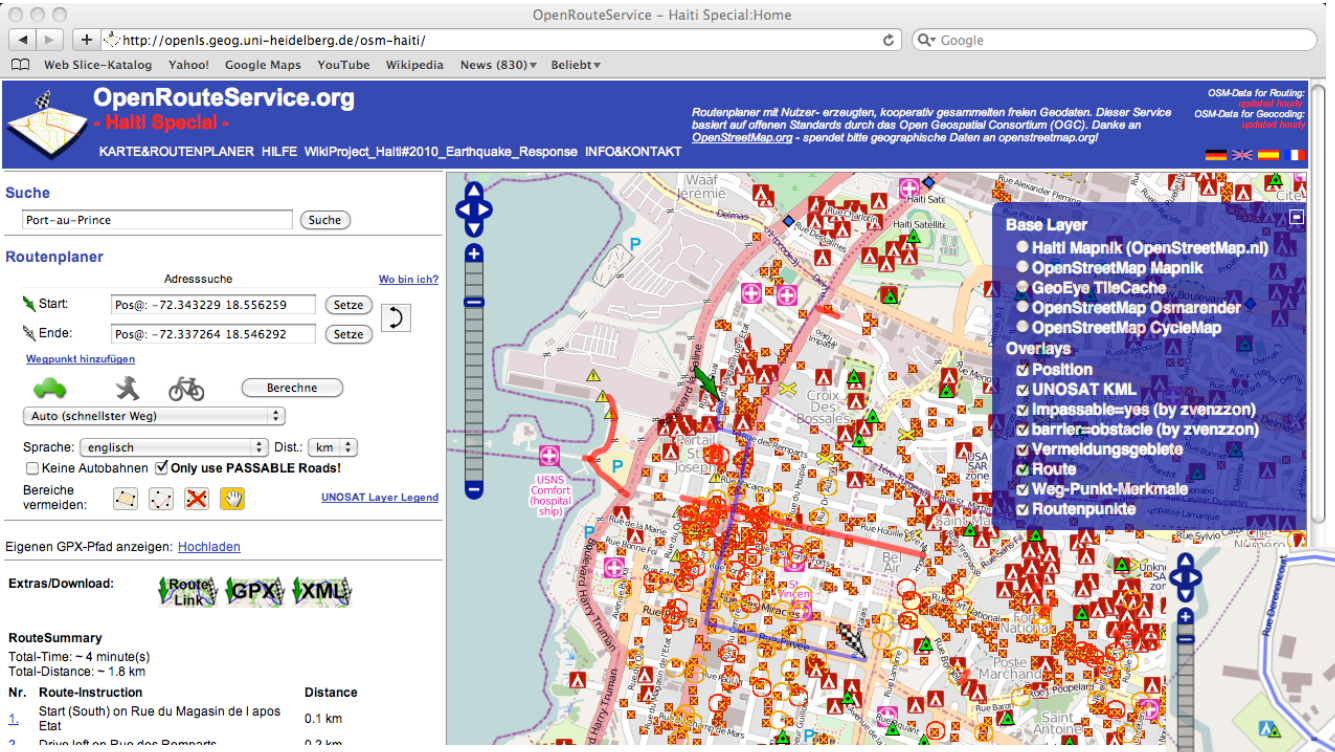
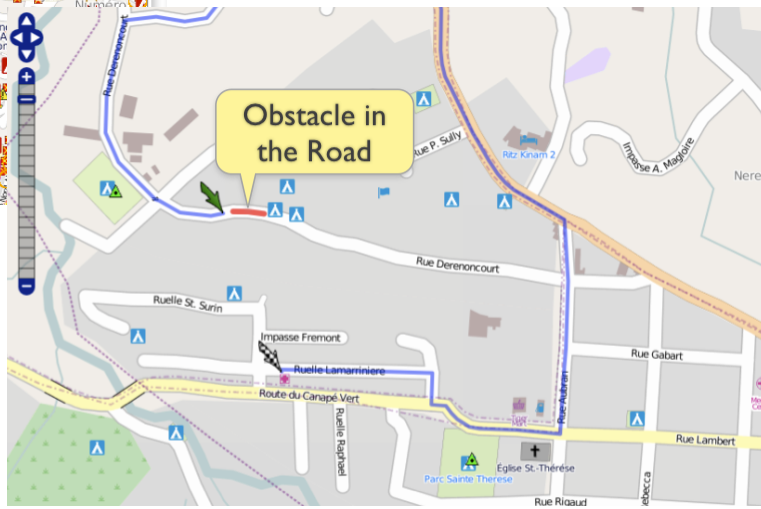
OSM in Disaster Management

OSM in the Philippines 2013



OSM-based emergency routing





Research Question

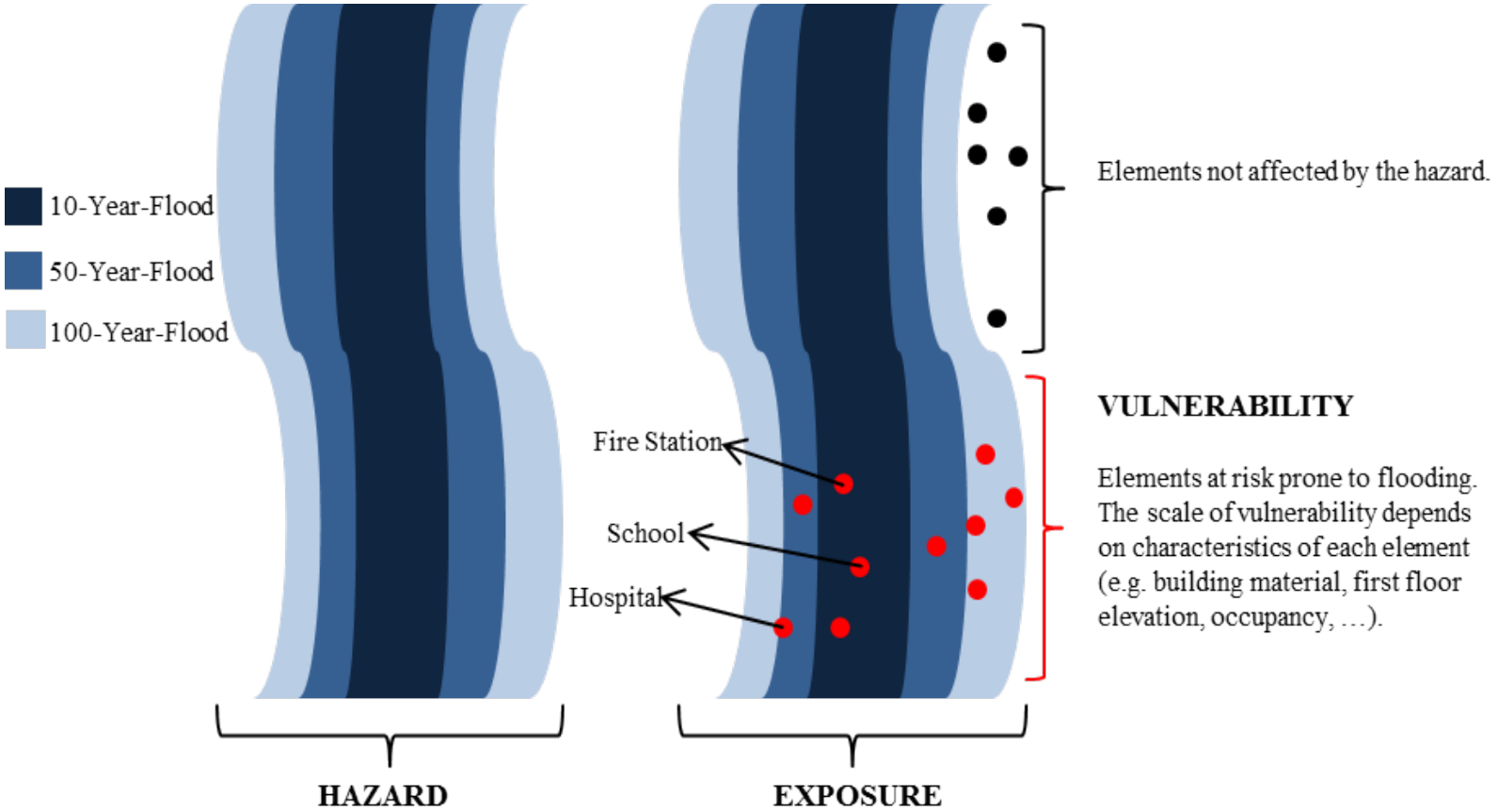
How can the potential of OSM be leveraged to support risk analysis and emergency planning?

Research Objectives

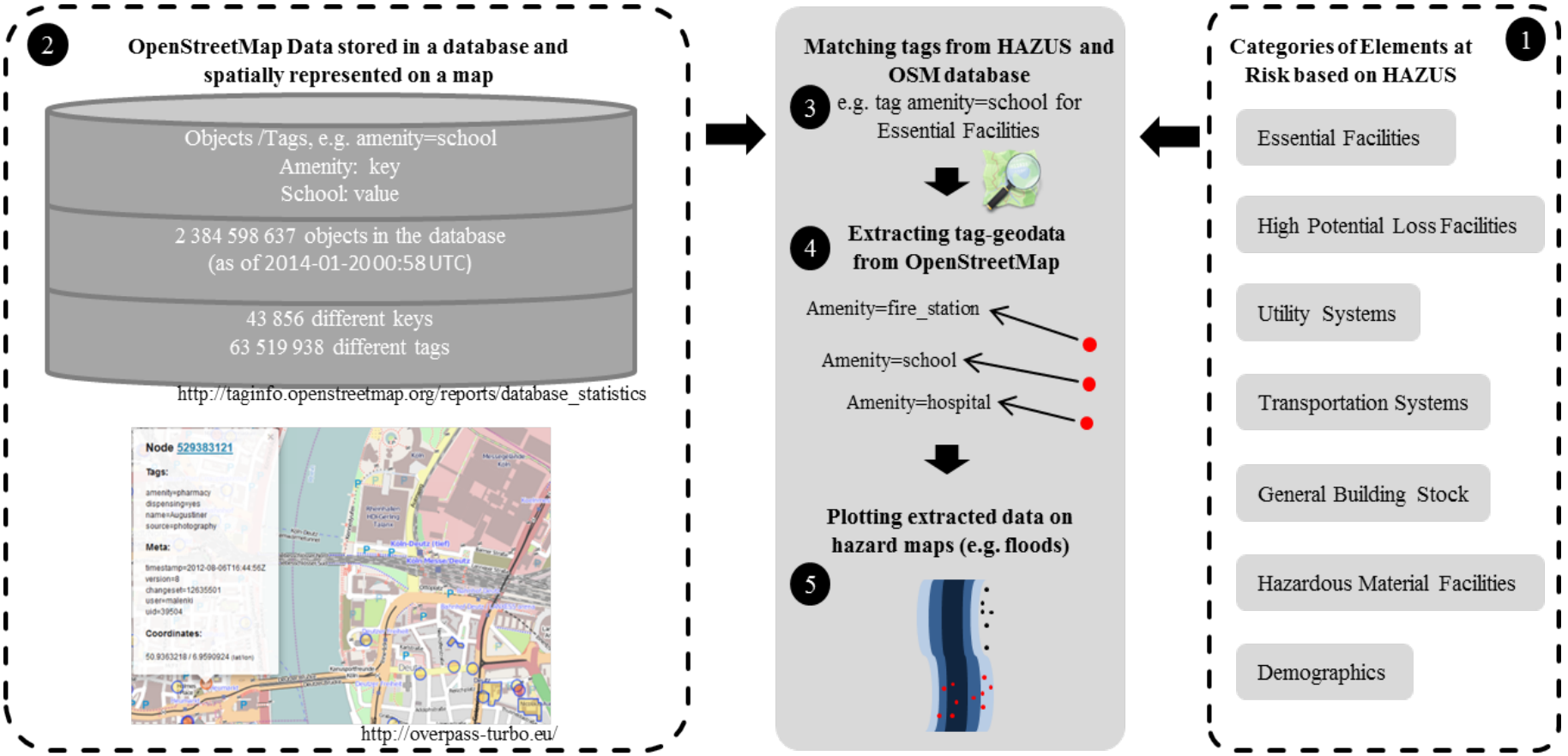
- **Goals:**
  - Development of an approach to identify Elements at Risk with Volunteered Geographic Information
  - Development of a software toolbox for the automated extration of elements at risk from OSM to subsidise emergency planning and risk analysis
  - Evaluate the quality of OSM for supporting risk analysis

Elements at Risk

- **Total Risk = (amount of elements at risk) x Hazard x Vulnerability**
  (Alexander, 2000)



Research Approach and Method

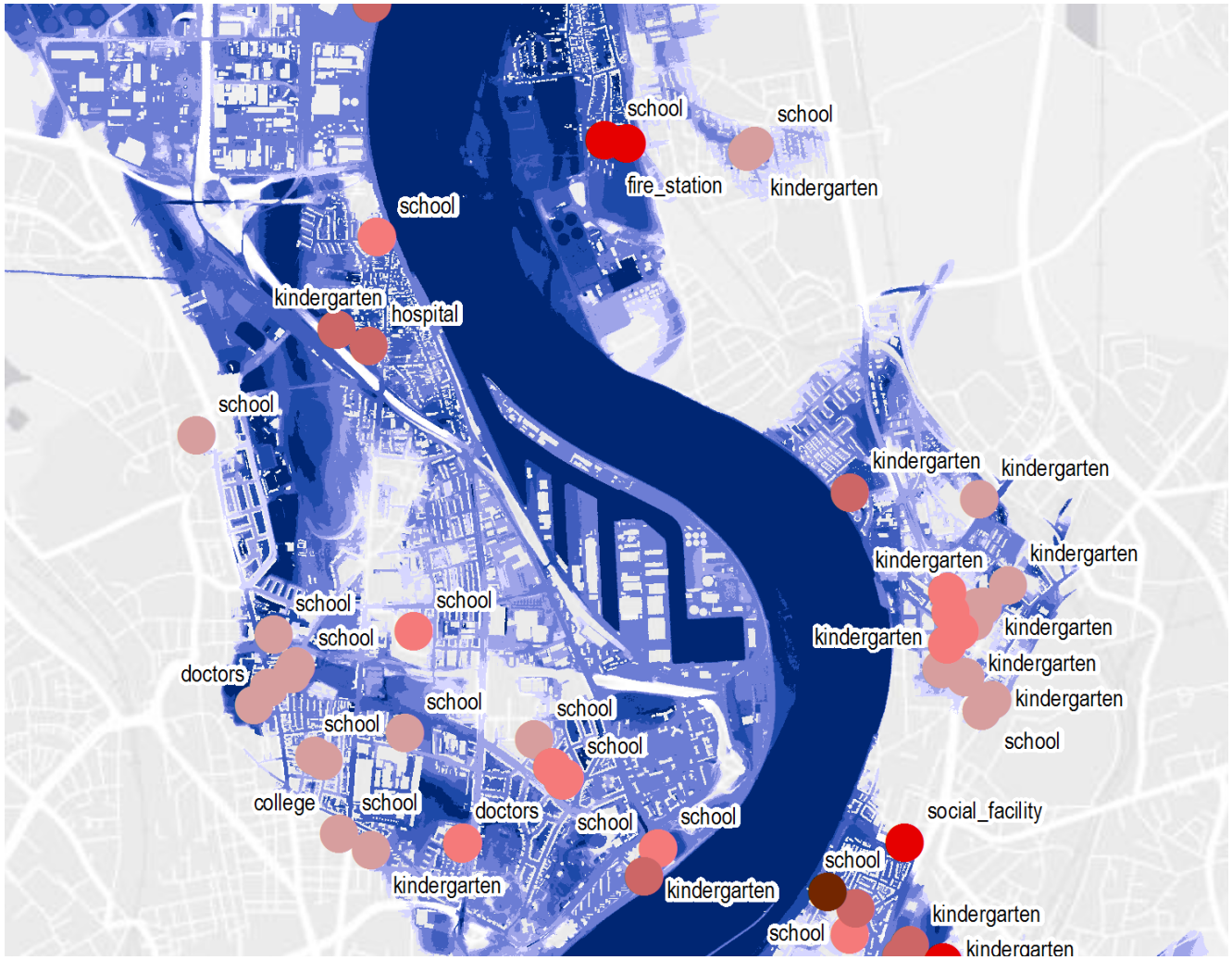


Data Model

- 25 OSM tags were identified for “Essential Facilities”

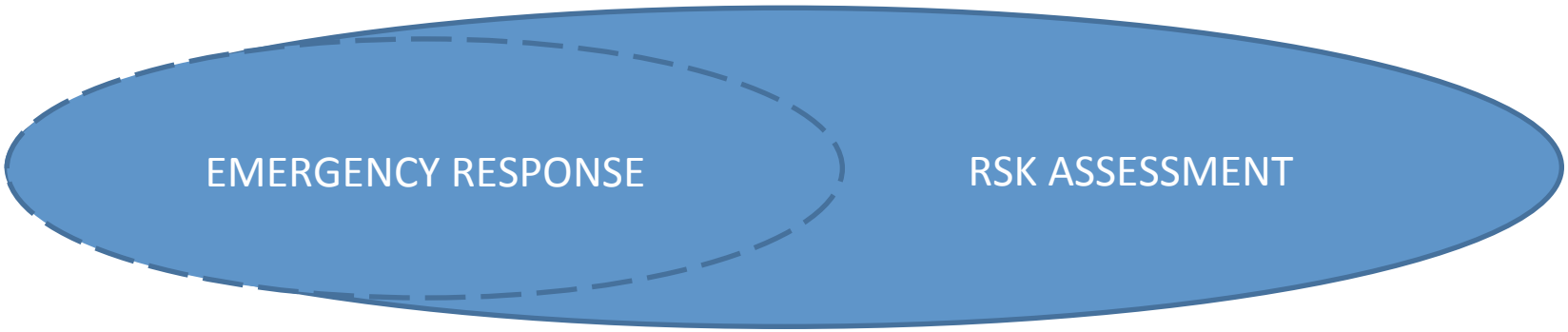
Essential Facilities							
OSM Key	**Amenity=**	**Building=**	**Landuse=**	**Historic=**	**Emergency=**	**Social Facility=**	**Aeroway=**
OSM Values	Police	Hospital	Retirement	Heritage	Ambulance Station	Shelter	Aerodrome
	Hospital	Fire Station			Fire Station		
	Doctors	Retirement Home					
	Clinic	School					
	Pharmacy	Kindergarten					
	Social Facility						
	Hospital						
	Fire Station						
	Retirement Home						
	Nursing Home						
	School						
	College						
	University						
	Kindergarten						

First Results: Pilot Application in Cologne



- 12 of the tags were used by mappers
- 168 objects identified in the category “Essential Facilities”

Future Work: Disaster Specific OSM Quality Evaluation



How to engage the Community?

- Qualify Objects for Risk Mapping through extended tagging
- Map your Environment through the lens of a Crisis Manager
- Build local OSM Risk Mapping Communities
- How to deal with privacy issues?

Conclusion and Future Work

- The approach is useful for providing a quick identification and assessment of critical objects in risk areas.
  - Further refinement of the data is needed
- The OSM data model already contains most of the important object types for emergency planning and risk analysis.
  - There is a lively community behind the data
- Future analyses should assess the quality (e.g. accuracy, completeness) of OSM data

Thank you

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