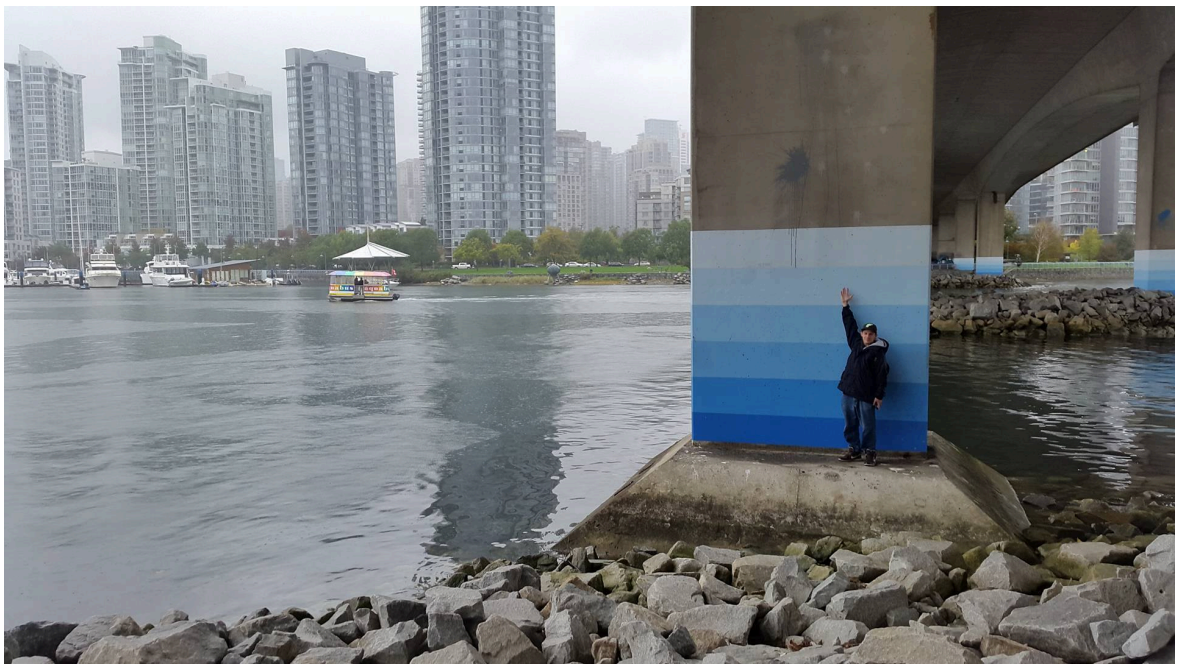
Conservation Sciences: 210



Assignment 2:
Climate Change Causes and Impacts in Your Neighbourhood

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Introduction:

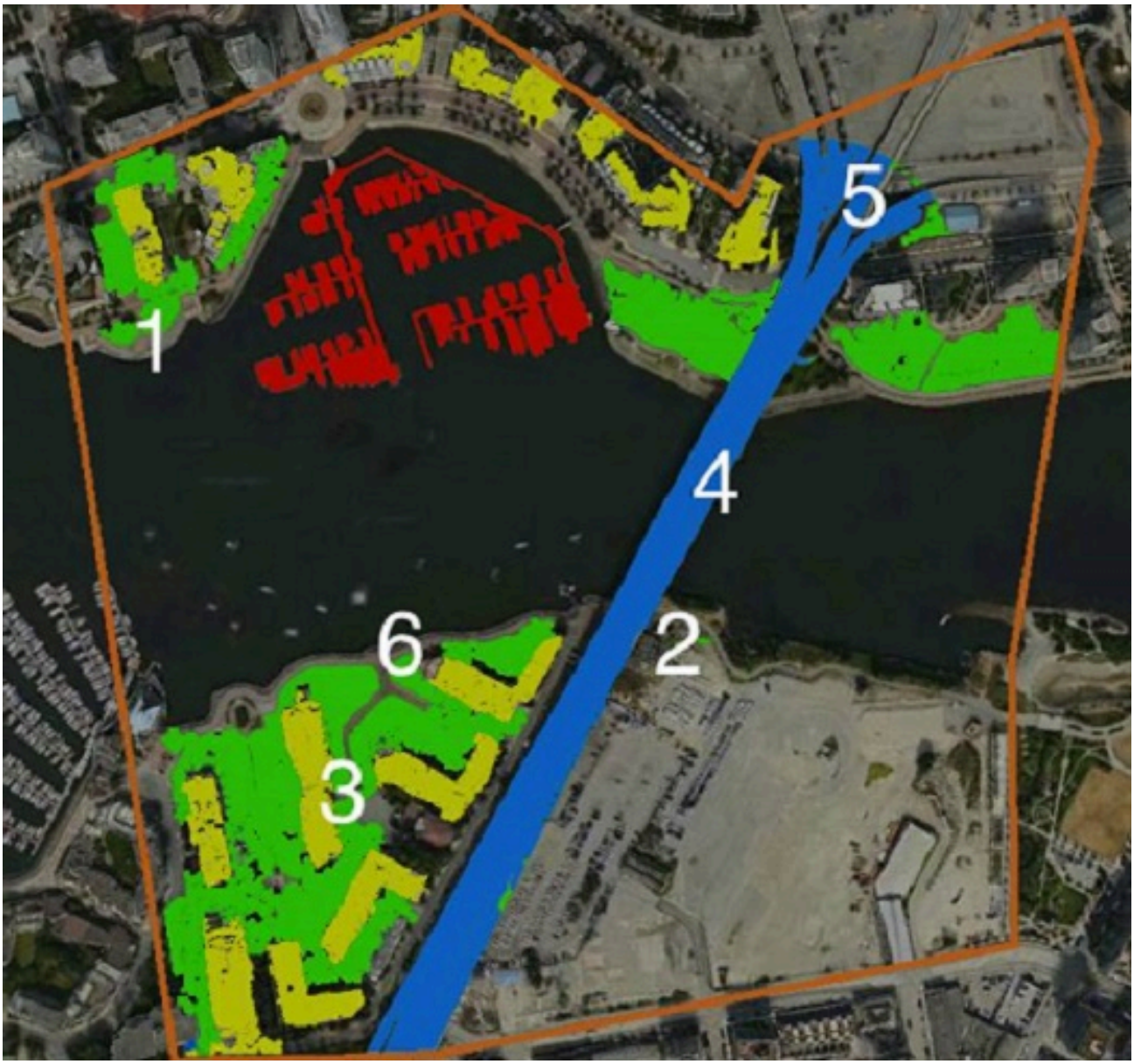
For our location of study we decided to focus on the area surrounding the Cambie Street Bridge in Vancouver's False Creek. Our site incorporates the characteristics of both the north and south sides of the creek. The area is characterized by having a mixture of high and low rise condominiums with open park spaces and greenways. The creek itself is part of the Pacific Ocean and is surrounded by a seawall shared by pedestrian and cyclists. On the northeast side of the bridge are new high rises condominiums under construction and on the southeast side an open gravel lot used as a parking lot and for the food cart festivals in the summer.

Although considered a scenic area of Vancouver, it is prone to localized flooding. During times of high tide and strong winds our area of study is vulnerable to the impacts of storm surges. Growing up in the area, I have witnessed a change for storm surge induced flooding. It has gone from a rare occurrence to a multi-annual event for the seawall and the areas surrounding it. As climate change continues to impact this area with sea level rise, major alterations of the seawall, residential units and other build systems will need to be considered. Because of this we have decided to focus on the impacts of storm surges in this area.

Brief History of the Area of Study:

This area has a rich history of industrial and residential development. From the 1885 to the 1950's False Creek was the heartland for Vancouver's industrial activities. A by-product of these activities is that it left False Creek heavily polluted with industrial runoff dumped into the creek laced with heavy metals (The Challenge Series, 2009). With the arrival of a socialist government in the 1960's, the south side of false creek was developed as social housing with a de-emphasis of car culture and a promotion of low carbon lifestyles. The north side of false creek is predominately high rise condominiums built after the 1986 World Exposition on Transportation and Communication; or better known as Expo 86. In 1988, Concord Pacific Developments lead by Hong Kong real estate developer Li Ka-Shing, bought 200 acres of land that had been used for Expo 86, along the north shore of False Creek.

Map of the Site of Study: The Area Below & Adjacent to the Cambie Street Bridge

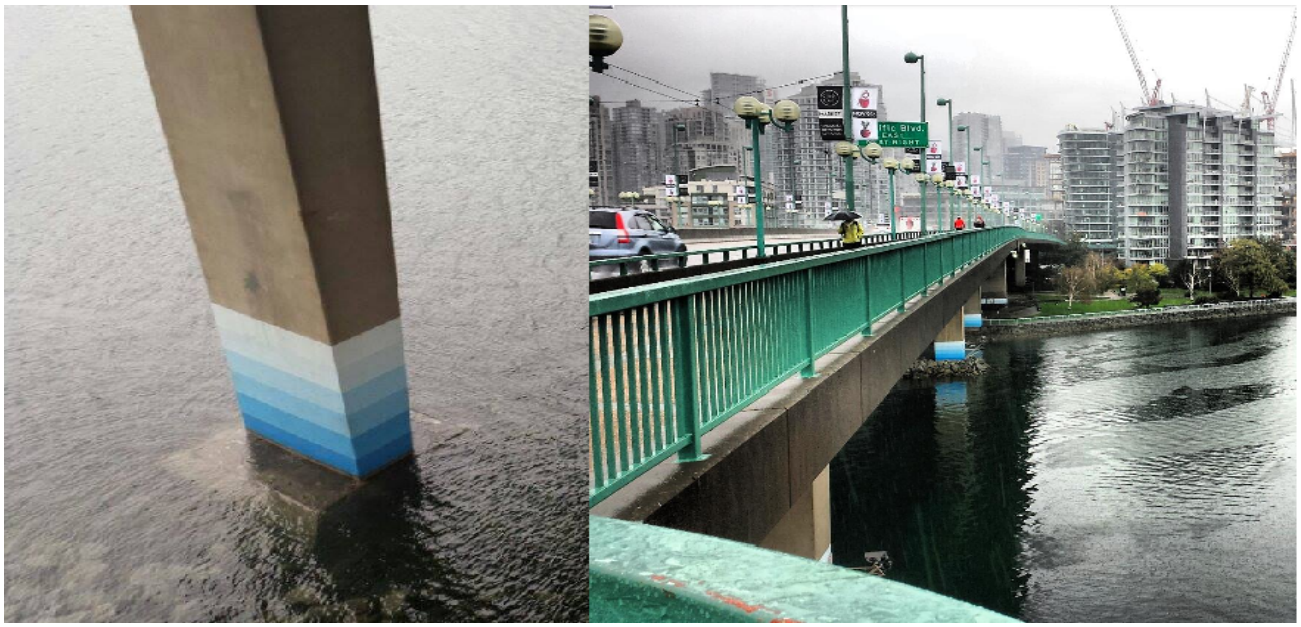


Local Climate Change Impacts & Vulnerabilities:

Area 1 On The Map

Annual flooding of the Yaletown seawall during the winter months is now a common sight. The increased frequency storm surges is making this area and the residences who live within it vulnerable to flooding.

Area 2



The "A False Creek" public art instalment are representative of the potential rise in sea level to five metres above 2006 mean levels as estimated by the IPCC (Artibise. 2012). As the sea level continues to rise it is probable that the seawall will have raised in order to reduce the impacts of storm surges on local residences

Area 3

Storm drains systems like this will likely need to be expanded to compensate for the increased water flow during future storm surge events or risk flooding local residencies, businesses and public areas.

Causes of Climate Change: Area 4

The Cambie Street Bridge with it's six lanes indirectly effects climate change. The bridge promotes the use of fossil fuel burning vehicles which does contributes directly to the release greenhouse gas emission and adds to the effect of climate change.

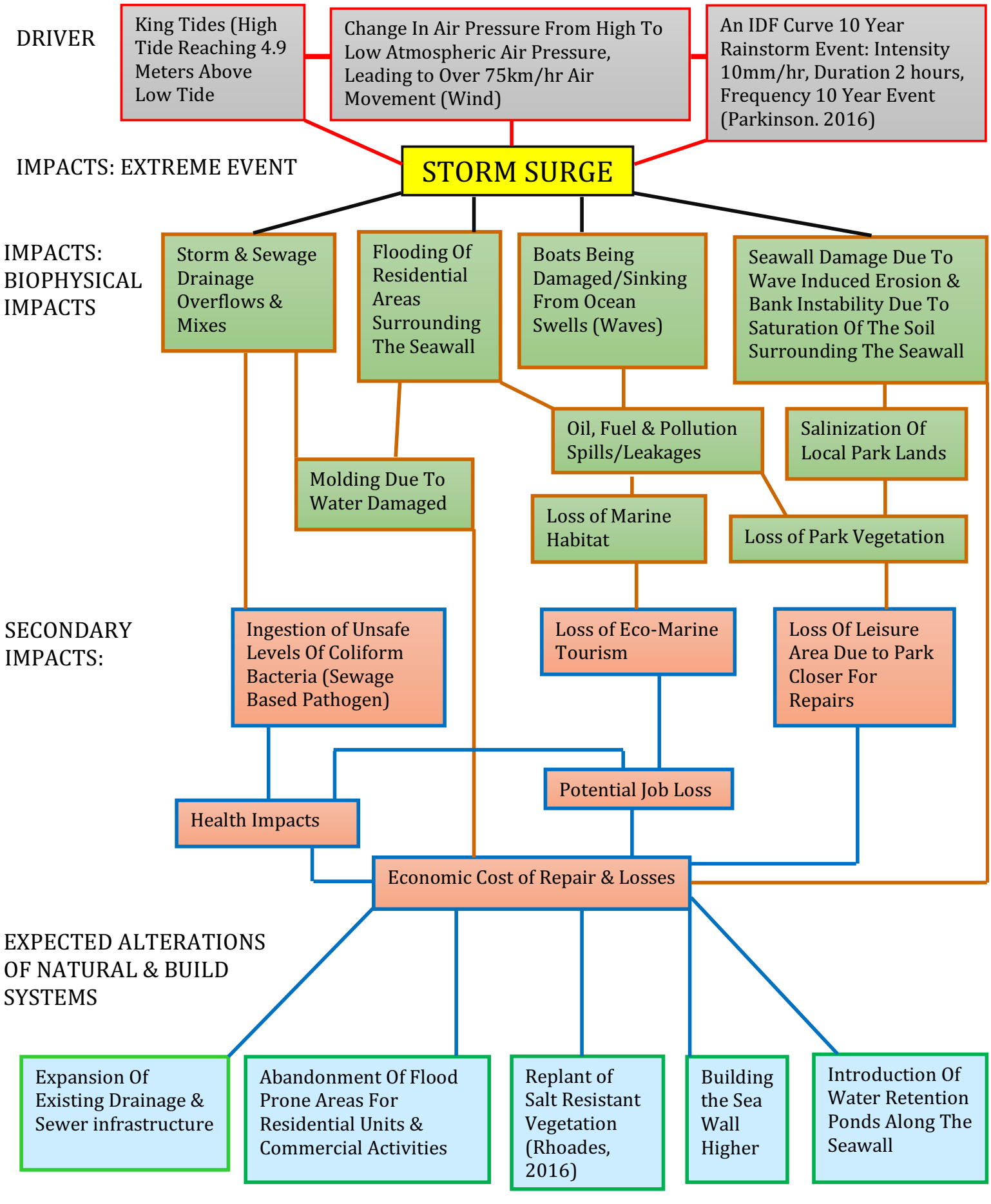
Area 5

The construction phase of these high rise buildings directly contribute to climate change. The carbon (energy) needed and released during: the transportation of building materials, the process of construction the buildings and the materials themselves all result in high carbon footprint activities.

Area 6

The large yacht of Yaletown are examples of high carbon activities that directly contribute to climate change. The fossil fuels needed to power these yachts directly releases exhaust emission into the atmosphere.

FALSE CREEK/CAMBIE STREET BRIDGE STUDY AREA FLOWCHART

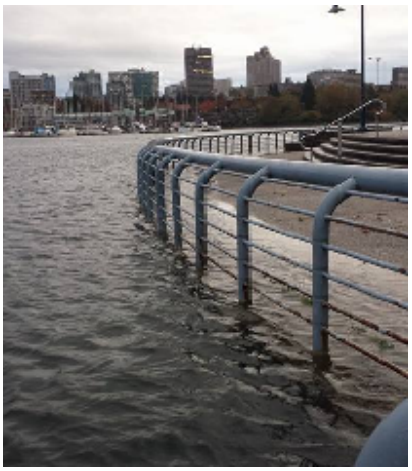


The drivers for our flowchart event are: an IDF 10 year rainstorm event (Parkinson. 2016), +75km air movements (wind), and the presence of a king tide in the area. The combination of these natural phenomena's leads to our extreme event: storm surges. Since our area of study is close to the oceans, these storm surges have biophysical impacts on the site. Water damage of residential housing and parkland areas due to storm surges induced flooding and overflowing of storm drains is likely to occur; this will lead to molding, structural damage of buildings and loss of park vegetation due to salinization of the soils. Wave induced erosion of the seawall and oversaturation of the soils surrounding the seawalls has the potential to cause structural damage to the seawall itself. These biophysical impact can lead to secondary impacts to humans. With the overflowing and mixture of storm water and sewage lines feeding into the creek, this has the potential to release unsafe levels of coliform bacteria; organisms associated with sewage contamination (Fraser Riverkeeper, 2016, para. 1). This can cause health problems and economic loss (due to death or missing work) for people who ingest water from the pathogen filled creek. Damage cause by the storm surges to the seawall, the surrounding building and moored boats will lead to high costs to repair and subsequent economic losses. The increase frequency of these extreme events and the effects of climate change will continue to persist and will likely need to some alterations of the built systems. With the increased water discharge during storm surge events, there will need to be an expansion of the drainage infrastructure to accommodate higher peak flows. Rebuilding of the seawall to an increased heights will be needed to done to combat sea level rise and to reduce the potential of future storm surge flooding; or local residence will have to abandon their homes in flood prone area which is characteristic of our site of study.

This is a fairly vulnerable neighbourhood, if the city does not consider making plans to raise the sea wall higher and to expand the current sewer and storm water drainage infrastructure in the near term, it susceptible to future flooding from storm surges events. An example of localized flooding occurred on December 17 2012, when a combination of high winds, high tides and storm surges caused flooding in the area (Walsch, 2014). In relative terms to an urban area, this location is a relatively low carbon neighbourhood. We attribute this to the high density of residential housing units with numerous skyscrapers on the north side, and multi-storey condominiums on the Southside of the creek. Residence are able to walk or bike to work, there are shopping and grocery stores within walking distance and outdoor recreational areas nearby for residential leisure. The close proximity of residential units to one another allows for the potential for units to share heating infrastructure. This reduces the demand for energy intensive sources like natural gas and helps to reduce the buildings overall carbon footprint.

The map to the right, shows the extent of the December 17, 2012 king tide induced flooding of the surrounding areas (Walsch, 2014. Pg. 66). Location 2 on the map is our research site for this project. The flooding of 2012, showcases the vulnerability of the area to climate change and sea level rise.

While revisited the site with two friends who grew up in the neighbourhood. Both wanted to witness the impacts of an incoming wind storm which contained the "energy remnants of Typhoon Songda" (Government of Canada 2016 para. 2). During our walk it became apparent that they were aware of some of the localized impacts and causes of climate change, but they were unable to recognize the implications of climate change on a global scale. They were shocked to learn that if global temperatures rise by 2^0C beyond pre-industrial levels that the effects of global warming will go beyond the tipping point leading to mass extinctions, crop failures, ocean acidification and increased number of climate refugees (Sheppard, 2012). It wasn't until they saw parts of the seawall under the water did it put it into prospective. After this point we felt they were able to put together what they already knew with what learned while on the walk, to gain recognition of the impacts of climate change in the local area. We were excited to see their community awareness expanded. To us, their dragons of inaction were limited cognition and sunk cost. Both knew the general message about climate change, but were unable to make the connection at the start of the walk. With one friend working in the food industry, he confessed that it would be for hard for him to give up eating meat every day. He explained that he worked with meat every day and it would be hard for him to break his eating habits. We saw this as the sunk cost dragon of inaction for him. He did suggest that he would try to cut down on his meat consumption as he expressed, "I'd rather see Vancouver above water than have a burger every day". To us this is his first steps to slaying his dragons of inaction.



October 15 2016, during a typhoon enhanced wind storm, parts of the seawall were under the water. This served as a recognition point for one of our friends who joined us on the site visit that day. This sight aided in increasing their community awareness with regards to the impact of climate change on the local enviroment.

In conclusion with our site being in close proximity to the ocean it is vulnerable to flooding due to storm surges and over capacitated drainage infrastructure. Our site includes high carbon landscapes with the presence of the Cambie Street Bridge. Our area of study is also home to high carbon activities characterised by the fossil fuel powered mega yachts of Yaletown. We can expect that as the sea level continues to rise, this area will require alterations to the build system; specifically the need to raising the seawall to a higher level. If the city does not consider making alteration to the build systems the residents who live within the area may face serious secondary human implications, as outlined in our flow chart. By including two friends in our second site visit we were able to assess their perceptions on climate change and have an open dialog on their social barriers to climate change mitigation. Walking away from this assignment we were able developed a deeper understanding of the impacts and sources of climate change on a local scale and make we were able to connect local issues with global challenges regarding climate change.

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