ABOUT ISOCARP

The International Society of City and Regional Planners (ISOCARP) is a global association of experienced professional planners. It was founded in 1965 in a bid to bring together recognized and highly-qualified planners in an international network. The ISOCARP network brings together individual and institutional members from more than 80 countries worldwide. As a non-governmental organisation ISOCARP is recognized by the UN, UNHCS and the Council of Europe. The Society also has a formal consultative status with UNESCO. The wealth and diversity of professional expertise, knowledge, and experience in the ISOCARP membership is unmatched in the planning field.

Although ISOCARP members work in many different fields they share a common interest in the spatial and environmental dimensions of urbanisation. They advise key decision-makers, proposing and supporting projects for intervention in a spatial context through general or specific actions.

The objectives of ISOCARP include the improvement of planning practice through the creation of a global and active network of practitioners. ISOCARP encourages the exchange of professional knowledge between planners, promotes the planning profession in all its forms, stimulates and improves planning research, training and education and enhances public awareness and understanding of major planning issues at a global level.

The association’s main event is the annual ISOCARP Congress, which focuses on a globally-significant planning theme and which takes place in a different country each year. Since 1965 ISOCARP congresses have taken place in all parts of the world on cutting edge topics and have always promoted knowledge creation and sharing in the planning profession.

Prior to the congress Young Planning Professional Workshops are organized. This YPP programme seeks to bring together emerging young planning professionals from all over the world to tackle ‘real-world’ planning projects.

All ISOCARP activities are covered in publications such as the ISOCARP Review, the International Manual of Planning Practice (IMPP), Congress proceedings, and special project reports.

ISOCARP recognises excellence through the Society’s Awards programme.

ISOCARP Urban Planning Advisory Teams (UPATs) assists international organizations by offering the extensive experience and expertise of ISOCARP members to work on important local or international planning projects, programs and policy initiatives.

In response to specific requests for ISOCARP assistance with research and consulting services, ISOCARP forms Technical Assistance Teams consisting of members who volunteer their expertise and experience. In 2016 ISOCARP officially established the Institute as a “Centre of Urban Excellence” and formal body for generating, documenting and disseminating knowledge for better cities.

The Institute’s core function is to design and deliver capacity building and continuing education programs, conduct research and promote knowledge transfer, as well as office short- and short-term consultancy services to government, non-government and international bodies worldwide.

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ISOCARP Head Office
International Society of City and Regional Planners
Gaby Kurrin, Programme Manager
Monica Ornek, Office Manager
Laan van Meerdervoort 70
2517 AN The Hague, The Netherlands
Phone: +31-70 346-2654
isocarp@isocarp.org
www.isocarp.org
COLLABORATIVE STUDENT AND COMMUNITY DESIGN IN A TIME OF CLIMATE CHANGE
PLANNING A FLOOD-RESILIENT WATERFRONT IN NEW ZEALAND

XINXIN WANG
MATTHEW BRADBURY
LUCIA CAMARGOS MELCHIORS
HUGH BYRD
The environmental effects of climate change pose numerous issues to urban development located along coastal areas. New Zealand, an island nation surrounded by the Pacific Ocean, is facing great challenges caused by sea-level rise and more frequent extreme storm events. Therefore, planning resilient waterfronts that adapt to the changing climate is vital to the creation of sustainable urban development in New Zealand coastal cities.

Although research on rising sea levels has led to several national guidelines and policies, plans and actions have not been adequately developed at the local government and community levels. To deliver a climate adaptation plan that could motivate the local communities requires innovative design solutions and close engagement with community members to ensure their real needs are met.

This article presents a case study in Whangarei, New Zealand that demonstrates how student-community engagement can shape a sustainable urban waterfront adapted to the changing climate. The Hīhīaua Peninsula project was initiated by Momentum North (MN), a community group founded in 2016 based on Northland Region, in collaboration with the Hīhīaua Community and Unitec Institute of Technology. Hīhīaua Peninsula was chosen as the first project because of its central location, its waterfront features, as its consistency with plans from the Whangarei District Council.

FIGURE 1: Hīhīaua Peninsula (left) and Whangarei city centre (right).
SOURCE: https://upload.wikimedia.org/wikipedia/commons/c/ca/Whangarei_panorama.jpg
BACKGROUND OF THE COLLABORATION

The Hīhīaua Peninsula, located in the central area of Whangarei District, has strong connections to early European and Māori settlements. More recently, from the 1920s until the early 1970s, the peninsula was expanded by a series of reclamations. Nowadays, it is mainly used for industrial use with a small proportion of residential and recreational functions along the riversides.

Within the peninsula is a 16.5 ha triangular site formed by the confluence of the Hatea River and the Raumanga Stream. At the apex of the triangle is a park, which is to be the site of a cultural centre. There are several problems associated with using this site. Because it is in the low land of two waterways catchments and close to the sea, it experiences flooding caused by high-tide and storm events. Since most of the site is the product of reclamation, the site has land stability issues. Finally, because of the peninsula’s industrial use, the site’s soil contains contamination and other environmental issues.
In 2015 the Whangarei District Council, the ruling body of the regional capital of Northland Region, proposed growth plans for the city centre of the District. The Hīhīaua Precinct Plan proposed a waterfront masterplan with an intensification of residential apartments and commercial buildings. As part of this plan, the Hīhīaua Peninsula was identified as a site for future waterfront development. However, this plan did not meet the desires of Hīhīaua community, including local business, property owners and stakeholders, due to the increasing social needs and the environmental problems of that area.

In response, Momentum North and Hīhīaua Community wished to develop a more nuanced master plan where working and living together formed a rounded community with an emphasis on the importance of cultural values and a sustainable environment. Together they proposed five themes for future development:

- **WORK**: The community wants to have more opportunity for employment in the area.
- **PLAY**: The group wants the Hīhīaua to be a destination for recreation for the citizens of Whangarei.
- **LIVE**: Not many people live in the CBD, yet Whangarei is growing rapidly. Development in Hīhīaua is a great opportunity for people to live in the centre of Whangarei.
- **LEARN**: The peninsula could become a cultural and educational hub for Whangarei with the assistance of the He Puna Marama Charitable Trust, the Pacific Indigenous and Local Knowledge Centre of Distinction (Pacific Centre), the Northland Youth Theatre and the proposed Hīhīaua Cultural Centre.
- **VISIT**: Hīhīaua has great potential as a tourist attraction.

**ORGANISATION OF THE STUDIO – MANDATE TO THE STUDENTS**

In response to this mandate, Unitec Institute of Technology developed a studio during the first semester of 2017 as a joint course integrating architecture and landscape architecture courses. This project was seen as an opportunity to investigate underlying environmental conditions in the development of an urban waterfront. It also was an opportunity for students to gain experience meeting the expectations of the community members. Twenty two students in the fourth year of the Bachelor in Landscape Architecture and 22 students in the first year of the Masters of Architecture Professional participated in the studio. Students worked in 10 groups, with each group having both architects and landscape architects. They work collaboratively, both interdisciplinary and with the community. The lecturers asked the students to privilege the environmental and cultural factors to ensure an ecologically and socially sustainable waterfront masterplan.
The first phase was an investigation of the site, its surroundings and the key concepts that would drive the design in the next phases. This phase included research, data collection, GIS mapping, literature review, site visits and meetings with community leaders to identify their main aspirations. In the first three weeks, each group completed this initial research period by compiling relevant data, publishing that information online, and demonstrating the social, cultural, physical and biological arrangement of the site.

Each team was then directed to design a masterplan for the site that incorporated the aspirations of the community group (WORK / PLAY / LIVE / LEARN/ VISIT) into a well-reasoned concept plan. We asked the students to show synthesis GIS analysis, document appropriate case study investigation, and demonstrate innovative solutions to accommodate the forecasted population increase. This concept plan should also show the provision for a community space, including a place for a building and a public space. Over another three weeks, each group created a proposition exploring urban typologies, climate change, flooding risk, sustainable and resilient strategies.

In last phase of the project, students designed a new building and landscape for the Pacific Indigenous & Local Knowledge Centre of Distinction. The methodology of this course was based on research by design, and was conducted using different techniques:
· Studio discussion;
· Lectures and informal talks with experts;
· Meeting with the community;
· Presentation to the community;
· Informal pin-ups;
· Critique sessions.
STUDENTS AND THE COMMUNITY ENGAGEMENT PROCESS

A key approach employed in this design studio involved community engagement. Communication with the various stakeholders was initiated early on and continued through all design phases. The project lasted three and a half months, during which there were four major meetings, including site investigation, master plan presentation, building/open space design presentation and final presentation.

At the beginning of the project, students were guided by the MN members and community representatives. During this phase the site was thoroughly investigated.

Students were then welcomed by a Powhiri – a traditional Maori ceremony – held in a local school. The community and students then sat down for a discussion around their concerned issues.
MASTERPLAN PRESENTATION

The masterplan presentation was held in Whangarei. Using design drawings, videos and models, students presented 10 scenarios to the community. Over 20 community members participated in the presentation and had an intensive discussion around each solution. Students then amended their masterplan according to community’s feedback and made detailed designs around a cultural centre and its open space. Tui Shortland was invited to come to Unitec for the building design critic. As Director of Te Kopu Pacific Indigenous & Local Knowledge Centre of Distinction, Tui played a critical role in the guidance, reinforcement and support for the design of the Maori and Pacifica Centre proposed for the site.

Informed by the community feedback and Tui’s comments on cultural centre design, students produced their final outcomes. In the final presentation, five members of the community group travelled to Auckland.

The following *Table 1* summarises the process of student-community engagement process. It shows the design phases and how the process and activities were developed.
STUDIO OUTCOMES

The studio produced a range of design ideas, from the radical idea dealing with massive tidal inundation, to more practical small-scale solutions. Key methods applied in the studio include GIS mapping, catchment analysis and sea-level rise data analysis. Based on extensive research and data analysis, students discovered a wide range of strategies to adapt to the changing climate. In the following section we present summaries of three of the student proposals for the project.

Table 1: Student-community engagement process

<table>
<thead>
<tr>
<th>Design Phase</th>
<th>Engagement</th>
<th>Time</th>
<th>Location</th>
<th>Attendees</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Research</td>
<td>Site investigation</td>
<td>March 9</td>
<td>Hihiaua</td>
<td>All students and lecturers MN, stakeholders and residents Local school students</td>
<td>MN guide students for site seeing Local school traditional welcome ceremony MN Introducing history, culture and expectation Discussion about problems and challenges</td>
</tr>
<tr>
<td>2- Design a masterplan</td>
<td>Masterplan presentation</td>
<td>April 4</td>
<td>Hihiaua</td>
<td>All students and lecturers MN and residents Mayor of Whangarei</td>
<td>Student present 10 design concepts Q+A section Community discussion and voting Community comments to each group</td>
</tr>
<tr>
<td>3 – Design a building or public space</td>
<td>Detailed design Crit</td>
<td>May 9</td>
<td>Unitec</td>
<td>All students and lecturers MN representatives Guest critics</td>
<td>Students present modified masterplan and how they transform masterplan concepts to detailed design Demonstrate solutions through design</td>
</tr>
<tr>
<td>Final presentation</td>
<td></td>
<td>June 8</td>
<td>Unitec</td>
<td>All students and lecturers MN representatives Guest critics</td>
<td>Students conclude their research and design, especially sea-level rise adaptation, stormwater treatment and cultural aspect</td>
</tr>
</tbody>
</table>

FIGURE 10 AND 11: Students presentation. SOURCE: Image credit to Xinxin Wang
SCENARIO 1

Scenario 1, produced by students Nick Slattery, Jingqian Sun, Losa Nimo, Benjamin Meredith, responds to climate change issues through the medium of landscape architecture. The GIS analysis of the site informed the design group that the surroundings of the site have serious risks of flooding in the future. Under the threat of a 3-metre sea-level rise in the next 300 years or so, the team envisioned that the Hīhīaua Peninsula becomes a learning island in the middle of the Whangarei lagoon. The human presence is limited on the island, while the natural and educational character is enhanced.

The Pacific Indigenous & Local Knowledge Centre explores the Samoan village as a key strategy to drive the design. The building has a strong connection to the landscape, to the cultural centre and the water. The landscape design explores a thoughtful use of Te Aranga principles ¹ in the design of the planting.

The exploration of cultural aspects to drive the design was appreciated by some members of the community group. Tui Shortland commented: “I love how the spatial arrangement of the Pacific Indigenous & Local Knowledge Centre is oriented to the Samoan Village.”

This scenario also showed the community group what can happen in the area as a result of future climate change. This element was uncomfortable, but it also was extremely relevant and provoked the discussion about the subject and showed the necessity to act to address the issue. As commented by one of the community members: “I liked the concept of ‘body, spirit, creativity and mind’ and the layout and Pacifica atlas theme worked well for me. I will be castigated, but I did feel slightly uncomfortable with the high degree of sensitivity to climate change in this one. I am an optimist that thinks humankind can and will do better than we currently are and in time to make a difference of some magnitude. I also believe that there will be technologies developed to mitigate some of the worst effects of what will obviously be an unstoppable amount of global warming. Let’s hope I am justified.” – Peter Ogle, Momentum North
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FIGURE 12: Perspective of Hīhīaua in 2300 (Scenario 1).
SOURCE: designed by Nick Slattery, Jingqian Sun, Losa Nimo, Benjamin Meredith

FIGURE 13: Site plan of Hīhīaua Cultural Centre (Scenario 1).
SOURCE: designed by Nick Slattery, Jingqian Sun, Losa Nimo, Benjamin Meredith
Organic and landscape features of the site provide an intersection between human and natural relationships. This aims to enhance and restore vegetation growth which is also part of intersection and discovery of the landscape.

SCENARIO 2
The Scenario 2 masterplan was prepared by Wesley Twiss, Yamen Jawish, Jill Koh, Sarah Mosley and Yujie Zou. It reflected the strong interest in water-sensitive landscapes. The flooding analysis and the wetland research informed important components of the masterplan, through an understanding of how the site responds to flooding. The northern edge of the site is designed as a soft and green area, enhancing connections with the river, and helping to purify the water. The southern edge has the major part of the construction. Between these two parts is the residential area, integrated with the landscape. The use of water inside the area attempts to restore the original river course, as it was before the land reclamation.

In the design phase, the concept is that of a village integrated the landscape and architecture. The Pacific Indigenous & Local Knowledge Centre surrounded by landscape, was designed as a group of buildings with a modest scale and quiet practically to be constructed in phases. The complex explores a sophisticated response to the brief, offering several different kinds of spaces for the users.

“The design of multiple buildings for the Pacific Indigenous & Local Knowledge Centre gives the impression that the centre is a complex itself. The round space for ‘meeting in the streets in the Village’ encourages integration” – Tui Shortland, Momentum North
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FIGURE 15: ← Site plan for the village (Scenario 2).
SOURCE: Designed by Wesley Twiss, Yamen Jawish, Jill Koh, Sarah Mosley and Yujie Zou

FIGURE 16: ↓ Cross-section of the village (Scenario 2).
SOURCE: Designed by Wesley Twiss, Yamen Jawish, Jill Koh, Sarah Mosley and Yujie Zou
SCENARIO 3

Sharon Eccleshall, Sianne Smith, Vignesh Krishnamoorthy, Aleesha Kumar and Shibing Li produced Scenario 3 which explores some key principles in the masterplan phase: re-use of existing buildings, tactical urbanism and a clear strategy to embrace the flooding. The majority of existing buildings are preserved, with some adaptations such as green roofs and internal elevations to deal with flooding. The new buildings explore the shape of the existing industrial constructions. View shafts are created to enhance the connections with the surrounding mountains and rivers. An elevated path helps navigation of the site. The landscape uses the green stormwater infrastructure to help to reduce the effects of flooding by using green roofs, wetlands and vegetated retention ponds.

In the design phase, the plan develops a strong connection with the Pacific Indigenous & Local Knowledge Centre, folding the surroundings into the central public space, retaining, and emphasising the central ‘street’ at two levels. Three options were designed for this building, following the same core concepts. The public space is the result of an in-depth investigation of how a public space can be both a piece of green stormwater infrastructure and have civic qualities. The landscape proposes the use of indigenous vegetation to share Māori knowledge and Mauri Tu to clean contaminated stormwater.

The preservation of the buildings and the exploration of tactical urbanism were appreciated by the community as important aspects of this proposition: “This project probably best met our original brief. It was clever in so many aspects. Firstly, it used a space that meant few would be disenfranchised by the new build. It had a central theme linked by the walkway but still managed to keep all options open. It meant that existing buildings or areas could be modified/replaced over time without compromising others, while still staying true to the spirit. ‘Power to the people’ involved community groups in the build.” – Peter Ogle, Momentum North.
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FIGURE 18: Masterplan for Hīhīaua Peninsula (Scenario 3).
SOURCE: Designed by Sharon Eccleshall, Sianne Smith, Vignesh Krishnamoorthy, Aleesha Kumar and Shbing Li

FIGURE 19: Site plan for public open space (Scenario 3).
SOURCE: Designed by Sharon Eccleshall, Sianne Smith, Vignesh Krishnamoorthy, Aleesha Kumar and Shbing Li

INCREASE PERMEABLE
| CREATE PLACE |
| REUSE EXISTING BUILDINGS |


THE LANDSCAPE HAS VARIOUS FUNCTIONS TO ACCOMMODATE THE SURROUNDING BUSINESSES AND RESIDENTS. THE SITE IS SET UP TO ASSIST IN RESOURCE MANAGEMENT WITH WATER AS ONE OF THE MAIN DRIVERS.

THE INCREASE OF PERMEABLE SURFACE ALLOWS THE SITE TO CATCH/HOLD & FILTER RAINWATER AND THE WETLANDS CREATES RETENTION OF EXCESS WATER TO ALLEVIATE THE STORMWATER NETWORK.

SCALE 1:2500
FINDINGS OF DEALING WITH CLIMATE CHANGE

Critical questions about the development of the contemporary waterfront in the age of climate change resulted in a series of strategies. This was particularly the case in dealing with sea-level rise where students produced strategies to embrace it, protect against it, or mitigate the flooding.

EMBRACING THE FLOODING

By adopting a resilient strategy that accepted flooding in some areas, the flooding problem could be accommodated. One of the techniques used by students was to raise the building footprint above the anticipated future sea level and to dig lakes/ rivers/streams to embrace water. Through close analysis of sea-level rise...
rise and a careful grading plan, the water-courses can not only ameliorate flooding, but also provide ecological benefits, recreational functions and add value to the site.

The Scenario 1 masterplan embraces the flood by accepting the anticipated sea level rise and creating a culture island to respond to this challenge. It proposed that all buildings be located in the middle of this new lagoon, creating a Noah’s Ark solution to commemorate the existence of the city. Other groups designed gated water-ways to connect the hinterland with the coasts. The controlled water gates can balance the water level through letting tidal water in, or releasing stormwater runoff.

**PROTECTING AGAINST THE FLOODING**

To create mechanisms of flood protection, soft and hard solutions were used in some designs. These included solutions like elevating the terrain, creating barriers to the sea, and increasing the amount of pervious surface. Because the site is in the lowland of two wider catchments, flood protection is needed against both sea-level rise and stormwater runoff. Strategies used in these studies include concrete banks and tidal barriers along the coastal edge.

Using GIS analysis, water-sensitive design solutions to reduce flood risk were explored by most groups. By running a hydrological programme in GIS, overland flow paths were identified, and sub-catchments were generated. Through buffering the flow-path system to either side, a green space network was created. This strategies to protect the site from flooding created more space to filter stormwater and increased the ratio of pervious to impervious surface.

**MITIGATING THE FLOODING**

Different strategies and techniques were designed to mitigate the flood effects in the urban area: the use of vegetation, green infrastructure and stormwater management.

Native trees and shrubs were proposed to filter and mitigate stormwater pollution. Strategies used in students’ designs included: green roofs, rain gardens, swales, wetlands and retention ponds. Through the combination of these devices, a stormwater treatment train was formed to mitigate flood-water.
CONCLUSION

The collaboration of community and students gave students opportunities to learn, discover, discuss, and identify critical issues that mattered to the community needs. The communication process also broadened the community’s views of development and provided the community with many provoking options that exceeded their expectations. While the effect of climate change on the site wasn’t at the forefront of the community concerns at the beginning of the project, the student’s detailed investigation alerted the community to the impacts of sea-level rise and flooding risk.

Climate change is a long-term issue that needs serious attention and continuous actions. This studio project produced ten flood-resilient solutions for the waterfront development in a New Zealand coastal city, each one deeply informed by the community perspective and needs. This project not only provided valuable experience for the students, it also received serious attention from the local authorities (Whangarei District Council) and has the potential to shape future council plan for the site.

The design outcomes were deeply associated with the community collaborative process and inspired diverse innovative solutions. The collaboration process raised awareness of the impacts of climate change and provided multiple benefits to students, community, and the local council. As a case study of a waterfront area in New Zealand, this project not only provided valuable insights into flood-resilience in the local context, but also contributed to a broader vision of cool planning in a time of climate change.

This project showcases the value of student-community collaborative design that has the potential to deliver real planning benefits in a time of climate change. As the Hīhīaua Peninsula masterplan is the first project selected by Momentum North, the success of this project will help the MN support other communities in Northland region and benefit local and national governments. As Peter Ogle summarised at the end of the project, “The goal has been to stimulate Northland’s economy by developing strategies and then to provide our local and national Governments with the backing and support of community members to turn those aspirations into reality. This has been the first small step and it has turned into a leap.”

Finally, the student efforts were well received. Ben Tomason, a leading member of the MN, comments “After several site visits, meetings, workshops, blood, sweat, passion and reviews in Whangarei and Auckland, the Unitec Students have presented a truly masterful piece of work that far exceeded any of our expectations”. Another stakeholder said, “You have done a wonderful service to
our city and provided us with so many thought provoking options. When we first conceived the idea, I think most of that loose group of people known as Momentum North had a very different strategy for development of the area than we do now, after having had the benefit of your thinking. That is a wonderful success for all stakeholders.”

ENDNOTES

1 The Te Aranga Māori Design Principles are a set of outcome-based principles founded on intrinsic Māori cultural values and designed to provide practical guidance for enhancing outcomes for the design environment. (Auckland Design Manual, 2018)
PEOPLE, PLACE, PARTNERSHIPS, SUSTAINABILITY AND RESILIENCE

DOUG FOTHERINGHAM