

# Sustainable Cities and Communities in a Changing Climate: Lessons from New York

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## Abstract

The Resilient Coastal Communities Project (RCCP) is a partnership between Columbia Climate School and the New York City Environmental Justice Alliance which collaborates with communities and agencies to develop and apply actionable, fundable, and equitable solutions to flood risks that also deliver complementary benefits such as habitat restoration and greater community cohesion. This paper presents a research project which investigates the ways in which the RCCP team support sustainable development by working towards SDG 11, Sustainable Cities and Communities, targets 11.3 and 11.5; SDG 13, Climate Action, targets 13.1 and 13.3; and SDG 14, Life Below Water, targets 14.1 and 14.2. Results indicate that the team have achieved some successes in their work toward SDG 11, SDG 13, and SDG 14. Challenges in implementation of resilience measures and in the inclusion of environmental justice communities within resilience planning remain.

Key words: *resilience; sustainable; coastal; climate; cities; communities; participatory; co-production*

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## Introduction

As climate change accelerates, sea levels rise, and severe weather events become more frequent, coastal cities and communities urgently require climate adaptation toward a sustainable future. The 2015 United Nations Sustainable Development Goals (SDGs) call for the creation of inclusive, safe, resilient, and sustainable cities and communities, with improved capacity for climate change mitigation and adaptation, and for a greater focus on environmental protection (UN General Assembly, 2015). Cities and communities around the world are working with government agencies, non-government agencies, and academia to address these issues, a task which can be challenging, as different stakeholders may hold incompatible perspectives on the actions which should be taken (Ellis, 2021; Holland, 2017; Klenk et al., 2017). In New York City, climate adaptation actions toward increased resilience for coastal communities often fail to provide equitable benefits for all sectors of society (DuPuis & Greenberg, 2019; Checker, 2020). Consequently, communities seek more environmentally just approaches within resilience planning to enable inclusive and equitable community contribution (Gallay et al., 2022b; DuPuis & Greenberg, 2019; Routledge et al., 2018).

### International Contexts for Environmental Justice

Environmental justice and climate justice issues have gained recognition in recent years, as it becomes apparent that climate change and rising sea levels will disproportionately impact socially and economically disadvantaged communities (IPCC, 2018). The terms “environmental justice” and “climate justice” refer to the need to remedy the inequitable distribution of risks created by climate change and environmental degradation, as the most severe impacts strike communities and countries already facing inequities (Gallay et al., 2022b; Stuart, 2018; Routledge et al., 2018). A new universal human right regarding access to a clean and healthy environment has recently been adopted (United Nations, 2022).

### Environmental Justice Contexts within the New York Metropolitan Area

New York City is located across several heavily urbanised islands, highly vulnerable to rising sea levels and severe weather events such as Superstorm Sandy in 2012 and Hurricane Ida in 2021, which caused fatalities and widespread devastation (Molino et al., 2020; Bautista et al., 2015). New York City’s public housing residents and less affluent communities reside largely within coastal flood zones, where contamination from polluted brownfields is dispersed during floods (Rudge, 2021; Foster et al., 2019).

The United States Army Corps of Engineers (USACE) conducted a New York-New Jersey Harbour and Tributaries Coastal Storm Risk Management Study (NYNJHATS) in

response to Superstorm Sandy (USACE, 2022). The study boundaries include New York City and the six largest cities within New Jersey, collectively, the New York metropolitan area (USACE, 2019). The study proposes a coastal storm protection infrastructure project featuring a combination of storm surge barriers and shoreline-based measures within the Hudson-Raritan estuary (USACE, 2022).

Criticism for the NYNJHATS argues that the focus on storm surge flooding neglects to consider both inland flooding, which occurs due to heavy rain overwhelming stormwater systems, producing combined sewer overflows, and blue-sky flooding, which is created by rising sea levels in the absence of severe rain (USACE, 2022; Molino et al., 2020). The combination of heavy rain, rising seas and storm surge will likely be implicated in the most severe coastal floods of the future; therefore, it is essential to address these combined risks holistically (Gori et al., 2022).

Coastal flood risk within the New York metropolitan area predominantly impacts coastal neighbourhoods and industries populated by black, indigenous and people of colour (BIPOC) communities, including public housing residents (Checker, 2020; Bautista et al., 2015). “Environmental justice communities” have been defined by the USACE as communities with a disproportionately high percentage minority or low-income population (USACE, 2019). Federal policy requires that the USACE assess environmental justice impacts when proposing flood protection projects (USACE, 2019).

There are six significant maritime industrial areas (SMIA) within New York City, all defined as environmental justice communities by the USACE (USACE, 2019; Bautista et al., 2015). Critical race theory argues that the presence of BIPOC communities within highly polluted industrial areas is a legacy of structural racism in land use planning (Bullard, 1993). Environmental justice communities often experience inequitable opportunities to engage in planning processes and influence adaptation actions within their neighbourhoods (Rudge, 2021; Klenk et al., 2017; Holland, 2017).

## [The Resilient Coastal Communities Project](#)

The Resilient Coastal Communities Project (RCCP) is based at Columbia Climate School as a partnership between Columbia University and the New York City Environmental Justice Alliance (NYC-EJA) and collaborates with communities and agencies toward solutions to coastal flood risks (Gallay et al., 2022b; Columbia Climate School, 2022). The RCCP fosters collaborations between practitioners, researchers, and communities, as envisioned in

Columbia University's Task Force Report on Directed Action, to develop actionable, fundable, and equitable solutions to flood risks that also deliver complementary benefits, like habitat restoration and greater community cohesion (Columbia University, 2022; Columbia Climate School, 2022). The RCCP was established by Columbia Climate School's Center for Sustainable Urban Development in response to New York City Panel on Climate Change predictions for the New York harbour (Columbia Climate School, 2022; Foster et al., 2019).

RCCP researchers aim to build on the momentum created by recent legislative and policy commitments around equity in climate resilience. These include the federal Justice40 Initiative (The White House, 2022), and New York State legislation such as the Climate Leadership and Community Protection Act (2019) and the Cumulative Impacts Act (2022). The Justice40 Initiative commits 40 percent of federal investments in climate resilience to disadvantaged communities, defined as those communities which have historically received less investment through government agencies (The White House, 2022).

The New York City Environmental Justice Alliance (NYC-EJA), a citywide advocacy network striving for environmental and climate justice for BIPOC communities and those living in low-income neighbourhoods, is integral to the RCCP (Gallay et al., 2022b; Columbia Climate School, 2022; Bautista et al., 2015). The project team, including NYC-EJA members alongside academics, partners with environmental justice communities to build community capacity and foster community empowerment to address coastal flood risks (Gallay et al., 2022b). These risks include fatalities during flood events and ongoing risks to human health through toxic contamination, mould, and pollution (Checker, 2020; Graham et al., 2016; Bautista et al., 2015).

The RCCP targets solutions to flood risks which also deliver environmental benefits through green infrastructure and nature-based solutions, such as living shorelines, reinforced dunes, restored wetlands, aquatic vegetation, and oyster reefs (Gallay et al., 2022a; Molino et al., 2020). The NYC Comprehensive Waterfront Plan includes various recommendations to protect the coastal environment and improve water quality within riverine and marine environments (New York Department of State, 2021). Non-government organisations advocating for the health of these environments, such as Riverkeeper and the Waterfront Alliance, are partners in the RCCP (Columbia Climate School, 2022).

## Aim and Objectives

This paper presents a research project which investigates the contribution made by the Resilient Coastal Communities Project team toward the United Nations Sustainable

Development Goals, specifically SDG 11, SDG 13, and SDG 14 (Columbia Climate School, 2022; UN General Assembly, 2015).

To achieve this aim, the objectives of this research are:

- to explore the ways in which the RCCP team's work supports progress toward SDGs 11, 13 and 14;
- to analyse successes and challenges for the RCCP team.

The subsequent sections of this paper review relevant literature which illuminates the relationships between the three selected SDGs and the RCCP, outline research methods, and present and discuss research findings.

## Literature Review

Within the New York metropolitan area, historical development decisions have created environmental contamination and ecosystem degradation, leaving communities vulnerable to climate change impacts. The 2030 Agenda for Sustainable Development pledges that no one will be left behind, which has relevance for environmental justice communities within the New York metropolitan area (UN General Assembly, 2015). This review examines academic research, community plans and government literature which relate to SDG 11, Sustainable Cities and Communities, SDG 13, Climate Action, and SDG 14, Life Below Water.

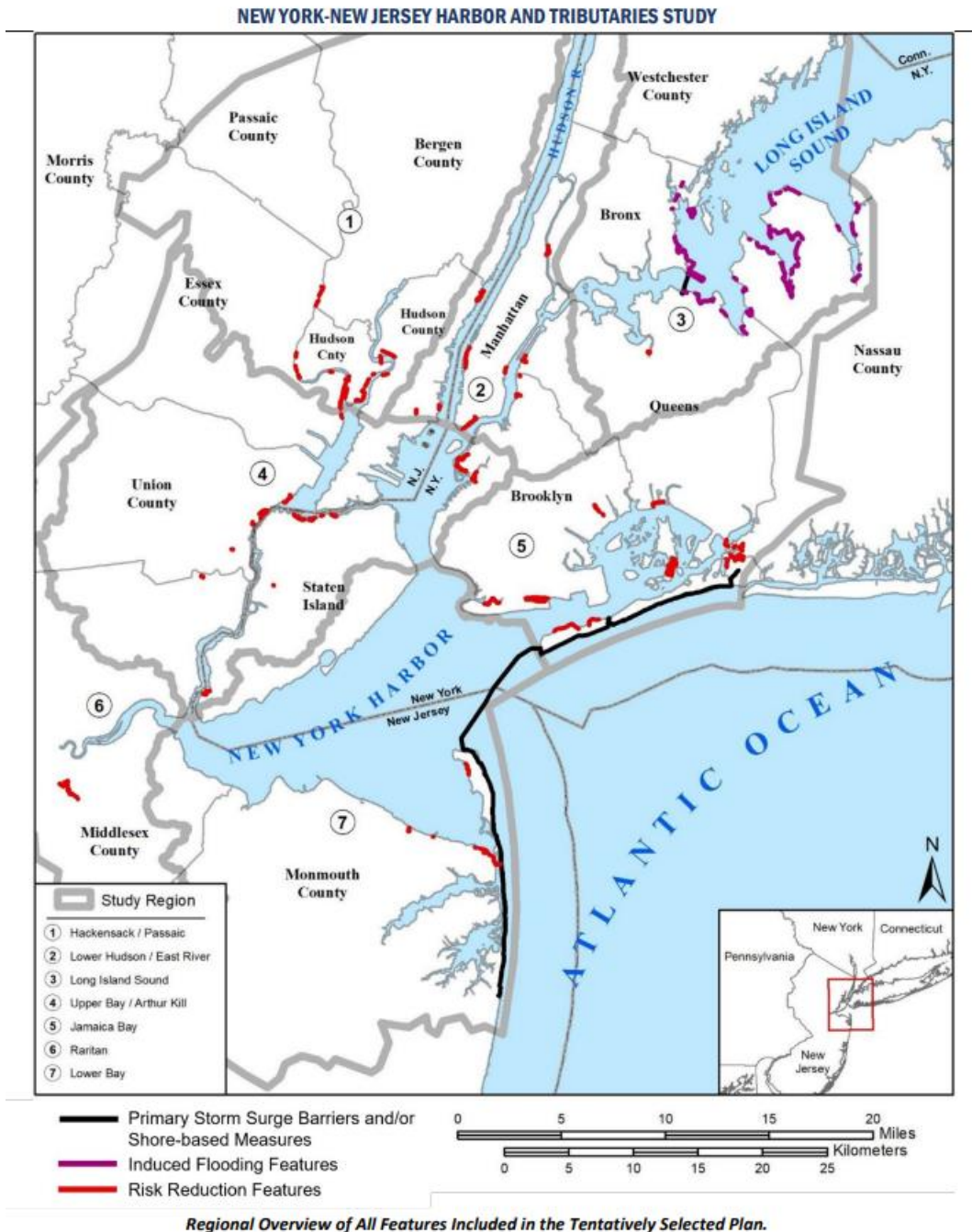


Figure 1. New York Metropolitan Area. (USACE, 2022).

### SDG 13 Climate Action

Climate change threatens the New York metropolitan area due to the density of urban settlement within a flood-vulnerable coastal region, as indicated in Figure 1. As sea levels rise and sea temperatures warm, intersecting risks emerge from the greater frequency of severe storms combined with higher sea levels; storm surge causes coastal flooding, while heavy rains flood inland, riverine, estuarine, and coastal areas (Gori et al., 2022; IPCC, 2018). In

addition to higher average sea temperatures, average air temperatures are increasing, creating urban heat island effects which contribute to elevated death rates during the summer months within the New York metropolitan area (Bock et al., 2021).

Communities require education, awareness-raising, and capacity-building to support climate change mitigation, adaptation, and impact reduction (Rudge, 2021; Foster et al., 2019; UN General Assembly, 2015). A more inclusive and equitable model of participatory planning to enable collaboration between citizens and the state might produce better outcomes (Gallay et al., 2022b; Berry et al., 2019; Routledge et al., 2018). Community involvement offers important benefits through the synergies that can occur between experts and laypersons working collaboratively (Morello-Frosch et al., 2011; Ziervogel et al., 2021).

Government agencies often plan in isolation and lack detailed local data, leading to ill-informed risk assessment and inadequate consideration toward mitigation measures (Satorras et al., 2020). For instance, a focus on grey infrastructure may prevail over alternative approaches such as green infrastructure or pre-emptive managed retreat (Lawrence et al., 2020; Valente & Veloso-Gomes, 2020). Further, government agencies may suffer institutional compartmentalisation, neglecting holistic consideration toward social, environmental, and public health contexts essential for community resilience (Ellis, 2021; Satorras et al., 2020; Bautista et al., 2015).

Efforts toward more inclusive resilience planning have begun. The New York City Panel on Climate Change (NPCC) seeks to incorporate equity into adaptation planning (Foster et al., 2019). The New York City Mayor's Office of Climate and Environmental Justice delivered a series of stakeholder workshops to collate climate knowledge from various sources (City of New York, 2022). These initiatives have potential to build community and institutional capacity within climate adaptation responses, strengthening social capital and community resilience (Kim et al., 2018). Planners may make better decisions, based on more dynamic and adaptive models of pathway planning for a range of possible scenarios, as co-produced knowledge from multiple sources begins to coalesce (Chambers et al., 2021; Norstrom et al., 2020; Lawrence et al., 2019).

## SDG 14 Life Below Water

Historical development within the New York metropolitan area has been unsustainable, with wetlands destroyed, waterways filled in, and housing constructed on landfilled waterfront areas (Checker, 2020; Rudge, 2021). Lands and waterways are contaminated with toxic and

hazardous substances such as lead, arsenic, radioactive waste, and residues from factories which formerly manufactured Agent Orange (USACE, 2022; Checker, 2020). Many brownfields are “Superfund” sites, under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) fund which provides for their remediation (USACE, 2022). Superfund sites and brownfields are largely located within floodplains, spreading contamination throughout the New York-New Jersey harbour, estuaries, and tributaries (USACE, 2022; Molino et al., 2020). Discharge of untreated and partially treated wastewater from combined sewers, where stormwater shares sewers with wastewater, is common during flooding, as excessive stormwater generated by the city’s impermeable surfaces overwhelms sewers (USACE, 2022; Molino et al., 2020).

Marine pollution impacts ecosystems and biodiversity, and for species such as fish, marine mammals, waterfowl, and submerged aquatic vegetation, outcomes have included population decline, extinction, and high rates of toxic contamination among surviving species (USACE, 2022). Nutrient pollution and sedimentation create eutrophication and algal blooms, leading to localised die-outs of aquatic flora and fauna (USACE, 2022).

Contamination of marine and freshwater environments within the New York metropolitan area has catastrophic impacts for biodiversity, which will likely worsen as climate change continues. Endangered aquatic species present include sturgeon, turtles, and whales, and the rivers of the region form migration routes for fish and eels (USACE, 2022). For waterfowl and seabirds, the region forms a significant stretch of the Atlantic Flyway, an important migration route (USACE, 2022). Over 40 species of birds considered to be at risk of extinction are found within the area, all threatened with the impacts of habitat destruction (USACE, 2022; Molino et al., 2020).

Green infrastructure and nature-based solutions can reduce the impacts of climate change upon communities while also delivering environmental benefits (USACE, 2022; Meerow, 2020; Checker, 2020). Natural or nature-based features, sometimes termed natural infrastructure, such as wetlands, oyster reefs, dunes, and beaches, can shield human settlements from storm surge, and filter land-based pollutants before and after stormwater enters the marine environment (USACE, 2022; Molino et al., 2020; Meerow, 2020). Green infrastructure, such as parks, greenways, rain gardens, or green roofs, which provide permeable surfaces within the urban environment, can capture stormwater, replenish groundwater, filter pollutants, alleviate urban heat island effects, sequester carbon, and provide habitat (Meerow, 2020; Molino et al., 2020).

## SDG 11 Sustainable Cities and Communities

Inclusive and equitable planning practices are needed to enable the fullest achievement of SDG 11 within the New York metropolitan area, where present inequalities reflect neoliberal values rather than the concept of a just transition toward climate adaptation (Ellis, 2021; Fainstein, 2018; Routledge et al., 2018; UN General Assembly, 2015). For example, BIPOC neighbourhoods such as the Bronx have fewer green spaces, a phenomenon dubbed park poverty (Meerow, 2020). Meanwhile, increased green infrastructure can bring green gentrification, which occurs when increased green amenities make an area more desirable, promoting wealthier settlement within coastal areas at risk from flooding (DuPuis & Greenberg, 2019; Checker, 2020). Post-Sandy resilience responses have produced green gentrification, displaced less affluent communities, and impacted social cohesion, reducing community resilience (DuPuis & Greenberg, 2019; Fainstein, 2018; Graham et al., 2016).

Intersectionality and critical race theory have informed the development of social vulnerability indices utilized by agencies with responsibilities in resilience planning (Foster et al., 2019); however, critics argue that these problematic models of social vulnerability assessment reduce the complexities within communities to an index score, while a more nuanced model which offers greater recognition of heterogeneity and intersectionality within communities is required (Tuccillo & Spielman, 2022). Community assets and capabilities are as relevant as vulnerabilities, and communities themselves often prefer to focus on community strengths (Nel, 2018; Holland, 2017).

A movement from tokenistic, top-down engagement processes, toward integrated, holistic, and participatory planning practices which offer inclusive opportunities for citizens and decision makers to collaborate toward co-production of resilience initiatives, may reduce the impact of disasters on the poor and vulnerable (Ellis, 2021; Routledge et al., 2018; Holland, 2017). Within the New York metropolitan area, urban planners risk institutional compartmentalisation, as the harbour and tributaries lie within the jurisdictions of different cities and states, while responsibility for various elements of resilience sits with disparate agencies (USACE, 2022; Checker, 2020; Satorras et al., 2020; Foster et al., 2019).

Integration of local knowledge through participatory planning processes might assist to remedy knowledge gaps which occur due to fragmentation across government agencies, as well as building better relationships between citizens and the state (Ziervogel et al., 2021; Routledge et al., 2018). Public participation occurs either within invited spaces, where the state or city invites citizens to engage in participatory democracy, or within created spaces,

where civil society groups mobilize independently to influence plans, for instance through demonstrations, petitions, or public forums (Berry et al., 2019). Either type of spaces holds potential for the co-production of knowledge around resilience and sustainability, although it has been argued that locally produced knowledge is inextricable from local contexts and not necessarily scalable to contribute to global solutions (Klenk et al., 2017).

Norstrom and colleagues (2020) propose four principles for co-production of sustainability knowledge, suggesting processes must be context-based, pluralistic, goal-oriented, and interactive. Context-based approaches are embedded within social, ecological, and economic contexts. Pluralistic principles require explicit recognition of diverse ways of knowing and doing and concede that all knowledge is situated. Where traditional, local, indigenous, or experiential knowledge is valued alongside official or academic knowledge, and opportunities exist to adapt or indigenize frameworks, enriched understanding results (Norstrom et al., 2020; Schramm et al., 2020).

As climate change brings increasing risks (Gori et al., 2022; Foster et al., 2019), which are inequitably distributed across communities (Checker, 2020; Bautista et al., 2015), it becomes critical to plan and implement resilience responses in an inclusive manner (Rudge, 2021; USACE, 2022). To minimise negative impacts on biodiversity through resilience responses, green infrastructure and nature-based solutions offer options with potential to benefit communities (USACE, 2022; Meerow, 2020; Molino et al., 2020). However, care must be taken to avoid unintentional impacts on disadvantaged communities, such as green gentrification (DuPuis & Greenberg, 2019), or the perpetuation of prejudices (Tuccillo & Spielman, 2022). Communities have demonstrated that they can contribute toward the development of integrated resilience responses with potential to address both sociocultural and environmental issues in sustainability (City of New York, 2022). Effective engagement with communities toward the co-production of sustainability knowledge and climate adaptation plans is critically important if a just transition toward climate adaptation is to occur, delivering successful progress toward SDGs 11, 13 and 14 (UN General Assembly, 2015).

# Research Methods

## Research Design

This research practicum was conducted through the Massey University Masters in Sustainable Development Goals. Participatory action research, involving a placement within an organisation, was the primary method used for data collection, alongside interviews and a literature review.

Through selection as a 2022 Fulbright New Zealand Science and Innovation Graduate Awardee, I was granted a scholarship to Columbia University as a visiting student researcher. I contacted Columbia Climate School to seek a research placement focused on participatory and community-led approaches to the sustainable management of freshwater and the marine environment. The Director of the Columbia Water Center referred me to the Resilient Coastal Communities Project.

## Research Context

The research practicum was conducted over a six-month period of full-time engagement as a member of the Resilient Coastal Communities Project team, from 1 August 2022 until 31 January 2023. The team works within the Center for Sustainable Urban Development, within Columbia Climate School at Columbia University, a private Ivy League research university in New York City. The broader location for the research was the New York metropolitan area, which includes urban areas within the neighbouring state of New Jersey.

The RCCP team includes representation from the Center for Sustainable Urban Development, Columbia School of International and Public Affairs, Columbia Climate School, Columbia World Projects, and the New York City Environmental Justice Alliance. Engagement with a broader group of stakeholders from coastal communities, government agencies, non-government organisations, and academia also formed part of the research project.

## Data collection

Data collection activities involved participation as a project team member, as well as literature review and analysis. The office-based work included data analysis and literature review comprising academic journal articles, books, community planning documents, government plans, legislation, maps, documentaries, videos, news articles and websites. A comprehensive analysis on the NYNJHATS draft environmental impact statement enabled preparation of a public comment for submission, and a guide to the plan's contents to assist community members and community organisations in preparing submissions. Additionally, an

academic journal article was drafted to share the findings of a series of community interviews on the topic of coastal resilience.

The placement included two coastal resilience conferences, *Sandy+10* and *At the Water's Edge*, which I attended and supported as a team member. I also participated in community engagement activities, such as delivering environmental justice workshops, attending public meetings, speaking at Council hearings, organising stakeholder meetings, delivering presentations to audiences of academics and professionals, attending community site visits, conferences, lectures, workshops, and networking.

Collectively, these activities generated data such as meeting minutes, presentation slides, conference notes, Zoom meeting transcripts, photographs and videos. Materials such as books, academic journal articles, news stories, community-led plans, government publications, planning documents, maps, documentaries, videos, and websites also formed part of the data collected and analysed.

### Ethical considerations

A pre-requisite for engagement in research with human subjects was the completion of a short course on research ethics mandated by Columbia University. This was a Human Subjects Protection course provided by CITI Program, which covered informed consent, research ethics and the Institutional Review Board process required to gain ethical approval prior to undertaking research with human subjects.

Collection of interview data was preceded by an informed consent procedure which involved reading a consent statement to interviewees and requesting their consent. The procedure was recorded along with the interviews via Zoom video conferencing technology and met the requirements for ethical approval granted through the Institutional Review Board.

## Findings

This research practicum explored the ways in which the RCCP works toward the achievement of SDG 11, Sustainable Cities and Communities, SDG 13, Climate Action, and SDG 14, Life Below Water, analysing the successes gained and the challenges faced by the team during this work (UN General Assembly, 2015). This section will discuss the team's work

toward each of these three goals, and toward specific targets under each goal, namely 11.3 and 11.5; 13.1 and 13.3; and 14.1 and 14.2.

### Findings: SDG 13 Climate Action

SDG 13, target 13.1, seeks to strengthen resilience and adaptive capacity to climate-related hazards and natural disasters (UN General Assembly, 2015). The RCCP seeks to build community capacity to address flood risk and extreme heat through engagement with communities directly affected by these hazards. Local knowledge gathered supports advocacy within the political sphere, ensuring that decision makers are actively lobbied toward inclusive planning practices. The RCCP participates in a community coalition, *Rise to Resilience*, alongside representatives of community groups, government organisations, non-government organisations and academia.

The NYNJHATS project is the largest coastal resilience and adaptation plan ever produced for the New York metropolitan area (USACE, 2022). When the NYNJHATS Draft Integrated Feasibility Report and Tier 1 Environmental Impact Statement was publicly released, the RCCP director was interviewed on television by Fox News (USACE, 2022; Formoso, 2022). The RCCP director and I spoke at a New York City Council Committee hearing on *Resiliency of the City's Beaches and Waterfronts*, providing written testimony to advocate for the New York City Council to equitably support the NYNJHATS project. The Council has since supported these recommendations through a formal submission to the USACE.

SDG 13, target 13.3, focuses on improving education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, and impact reduction (UN General Assembly, 2015). RCCP professors teach within the Masters in Climate and Society (Columbia Climate School, 2022). The team delivers capacity-building workshops to community groups; for example, I attended two youth environmental justice workshops during the summer, one focused on extreme heat and the other on flood risk. The RCCP team also supported Climate Knowledge Exchange workshops led by the New York City Mayor's Office of Climate and Environmental Justice (City of New York, 2022).

RCCP members share climate expertise by organising or speaking at conferences such as the *Rethinking Water* conference held during NYC Climate Week, *Sandy+10*, which focused on coastal resilience lessons learnt in the ten years since Superstorm Sandy, and *At the Water's Edge*, which focused on coastal resilience internationally. The RCCP produces academic publications which are published open access where possible. The team also produces content targeted to the broader community, such as blogs, community newsletters,

podcasts, radio and television interviews, opinion editorials and media releases to inform news articles, which are widely distributed. These diverse media aim to inform, educate, and support capacity-building, both at the community level and the institutional level.

#### Findings: SDG 14 Life Below Water

SDG 14, target 14.1 seeks to prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities, including marine debris and nutrient pollution (UN General Assembly, 2015). During the process of selection between five potential NYNJHATS resilience plan options (USACE, 2019), the RCCP advocated against Option 2, a huge storm surge barrier across the mouth of the New York harbour, and lobbied for options which included more shore-based features, entailing less catastrophic effects on the marine environment. Option 3B, which features several smaller storm surge barriers, has since been identified as the tentatively selected plan (USACE, 2022).

In 2022, the RCCP conducted a series of interviews with ten community-based organisations which has yielded a short-form working paper (Gallay et al., 2022b) and an academic journal article submitted for publication early in 2023. Marine pollution from combined sewer overflows and flood inundated brownfields was a significant topic within these community interviews, which featured three environmental protection and restoration organisations.

The RCCP advocates for increased green infrastructure such as green spaces, permeable paving, and stormwater retention areas to alleviate excessive stormwater in areas with impermeable surfaces, which add to inland flood risk. At a New York City Council Committee hearing in October 2022, the RCCP director provided testimony around combined sewer overflows and green infrastructure.

SDG 14, target 14.2, seeks to sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and to act for environmental restoration (UN General Assembly, 2022). The NYNJHATS project has adverse implications for aquatic wildlife if the proposed storm surge barriers are installed, altering tidal flows, affecting salinity, turbidity, and dissolved oxygen levels, and allowing greater concentrations of pollutants to accumulate (Ralston, 2022; USACE, 2022). The RCCP advocates for the use of green infrastructure and natural and nature-based features in reducing flood risk, such as oyster reefs, dunes, and wetlands for coastal areas, and green infrastructure such as planted areas and permeable paving for inland areas.

## Findings: SDG 11 Sustainable Cities and Communities

SDG 11, target 11.3 aims to enhance inclusive and sustainable urbanisation and capacity for participatory, integrated, and sustainable urban planning (UN General Assembly, 2015). Two RCCP members and several advisory board members have urban planning backgrounds (Columbia Climate School, 2022). The team's research project features community interviews around participatory planning processes, and the subsequent working paper and draft journal article are closely focused on recommendations for inclusive participatory planning processes (Gallay et al., 2022b).

Fragmentation in planning processes is an issue within the New York metropolitan area, and the RCCP seeks to promote greater integration. There is no regional government within the New York metropolitan area, which is served by the state governments of New York and New Jersey, as well as the New York City Council, therefore a non-government organisation, the Regional Planning Association (RPA), attempts to bridge these gaps between governments (RPA, 2022). Community-led planning initiatives shared by the RCCP's partners were published via an NYC Climate Resiliency Mapper tool, which utilises GIS technology to provide a searchable map linking community plans (RPA, 2022).

SDG 11, target 11.5 aims to reduce the impacts of disasters, including water-related disasters, with a focus on protection for the poor and for vulnerable communities (UN General Assembly, 2015). The team has an environmental justice focus, as demonstrated through partnership with NYC-EJA, and community organisations interviewed for the participatory planning research project work primarily within the environmental justice space. The RCCP actively advocates for greater recognition of the needs of the poor and vulnerable communities within urban planning, particularly regarding flood protection.

Through advocacy on the NYNJHATS project, the team seeks to strengthen the focus on environmental justice communities within the project, highlighting the consequences of proposed storm surge barriers which risk induced flooding by deflecting waves onto adjacent communities not sheltered by the barriers, as well as trapping inland floodwaters inside the barriers (USACE, 2022). The Sandy+10 Conference, which involved participation from RCCP team members, advisory board members and community interviewees as panellists, moderators, and key organisers, highlighted the voices of environmental justice communities within coastal resilience planning.

## Discussion

Climate adaptation requires urgent action, and participation processes tend to be captured by people of power and privilege (Satorras et al., 2020); therefore, the RCCP use their positions within academia to advocate for the inclusion of marginalised communities holding important local perspectives in climate resilience planning (Chu et al., 2018). The inclusion of these voices within participatory resilience planning, in alignment with SDG targets 11.3 and 11.5 (UN General Assembly, 2015), may assist to address power imbalances and support a just transition within climate adaptation (Rudge, 2021; Routledge et al., 2018). However, risks remain that despite the investment of significant time by communities within these processes, their proposals may not be implemented (Chu et al., 2018), as occurred with the East Side Coastal Resiliency Project (Checker, 2020).

Institutional compartmentalisation within the New York metropolitan context presents challenges for climate adaptation (Satorras et al., 2020; Chu et al., 2018), impeding progress toward SDG targets 13.1 and 13.3 (UN General Assembly, 2015). The New York City Council professes support for the role of localised climate knowledge (City of New York, 2022), yet this attitude may not extend to their partners in cross-agency climate adaptation projects such as the NYNJHATS. The RCCP recognises the value in collaboration toward integrated localised information, such as the NYC Climate Resilience Plan Mapper, which seeks to address the knowledge gaps created by fragmentation of resilience responses across agencies (RPA, 2022; Valente & Veloso-Gomes, 2020).

The achievement of environmental outcomes around water quality, as outlined within SDG 14 (UN General Assembly, 2015), also face challenges of institutional compartmentalisation (Satorras et al., 2020). Many New York Superfund sites remain unremediated due to lack of clarity around parties responsible for the costs of cleaning up (USACE, 2022; Checker, 2020; Bautista et al., 2015). Meanwhile, budgets are not strategically aligned across agencies toward green infrastructure initiatives to capture stormwater (Molino et al., 2020); for example, the Department of Transportation is not resourced for this work within transport corridors (Bock et al., 2021; Checker, 2020). The New York City Green Infrastructure Program, managed by the Department of Environmental Protection, primarily supports initiatives within parks, critics arguing that the neighbourhoods most in need have not been the ones to benefit (Meerow, 2020). The RCCP collaborates across communities and government agencies, advocating for community voices and community plans which address these issues (RPA, 2022).

## Conclusion

The Resilient Coastal Communities Project works toward resilient coastal communities and sustainable cities within the New York metropolitan area, their actions supporting SDGs 11, 13, and 14 (UN General Assembly, 2015). The RCCP seeks to build capacity for participatory, integrated, and sustainable urban planning, as outlined in SDG target 11.3, with a particular focus on flood protection for vulnerable environmental justice communities as outlined in SDG target 11.5 (UN General Assembly, 2015). Positive engagement with the USACE on the NYNJHATS project offers one example, although resilience planning continues to favour economic benefits above social or environmental benefits.

SDG targets 13.1 and 13.3 seek to strengthen resilience and adaptive capacity while improving education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, and impact reduction (UN General Assembly, 2015). The RCCP collaborates with community partners across New York and New Jersey to support community capacity building, knowledge sharing and networking. Additionally, the RCCP supports agencies in developing their engagement capacity. Nevertheless, physical resilience resources such as green infrastructure, grey infrastructure and nature-based solutions have yet to eventuate at the levels necessary to protect the New York metropolitan area from future climate risk.

SDG targets 14.1 and 14.2 focus on the reduction of marine pollution and the protection and restoration of marine and coastal ecosystems (UN General Assembly, 2015). RCCP advocacy for green infrastructure and nature-based solutions to flood issues, if successful, will benefit to the marine environment. For example, reduced stormwater pollution from sewers, and habitat restoration for wetlands and oyster reefs which can act as storm surge buffers for urban areas, support SDG 14. However, while green infrastructure is on the rise within the New York metropolitan area, much historical damage remains to be remediated, such as brownfields within floodplains.

To improve action toward the achievement of SDGs 11, 13 and 14 within the New York metropolitan area, inclusive participatory urban planning processes which explicitly engage environmental justice communities is needed. Decision makers should recognise existing community plans, rather than conducting community engagement that fails to build on previous planning processes and may induce a sense of consultation fatigue. Effective engagement requires partnerships with trusted community organisations. Community needs should be considered, and resources allocated to addressing barriers to engagement.

For future research in participatory planning to support resilience within coastal communities, it would be advantageous to engage with a broader range of communities, to seek a greater breadth of community co-produced knowledge. Interviews with indigenous communities, presently underrepresented in sustainability research within the USA context, might offer further insights. Additionally, understanding might be enriched through interviews with planners and decision makers from government agencies, examining their perspectives, needs, and the barriers that they face in implementing participatory planning processes to support community climate adaptation.

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# Appendix 1: Human Research Ethics Approval: Human Subjects Protection Certification



Completion Date 10-Aug-2022  
Expiration Date 09-Aug-2025  
Record ID 50505107

This is to certify that:

**Aya Morris**

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

**Human Research**  
(Curriculum Group)  
**Human Subjects Protection SBR**  
(Course Learner Group)  
**1 - Basic Course**  
(Stage)

Under requirements set by:

**Columbia University**



Verify at [www.citiprogram.org/verify/?w1aa958f6-b061-4136-8928-f018a083b247-50505107](http://www.citiprogram.org/verify/?w1aa958f6-b061-4136-8928-f018a083b247-50505107)

## Appendix 2: Notes on the Author

Aya Morris is a Master's candidate in Sustainable Development Goals at Massey University in New Zealand. During 2022-2023 Aya worked with the Columbia Climate School as a Visiting Student Researcher for the Resilient Coastal Communities Project through a Fulbright New Zealand Science and Innovation Award.

Aya received her B.A. in Psychology, with a minor in English, and her graduate diploma in Educational Psychology, from Massey University. She also holds a Diploma in Te Aupikitanga ki te Reo Kairangi from Te Wānanga o Aotearoa.

Aya has worked in a variety of fields including sustainable development, community development, youth development, education, mental health, health and safety, and emergency management.

Aya has focused her graduate work exploring themes of community participation in environmental sustainability, biodiversity, and freshwater management initiatives alongside her coastal resiliency research.

