

USE OF WATERSHED PLANS TO SUPPORT ENGAGEMENT FOR NPS-FM IMPLEMENTATION

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ABSTRACT

Auckland Council is implementing an integrated watershed planning process (integrated catchment management) in order to follow international best practice in water management, and to meet requirements under the National Policy Statement for Freshwater Management 2017 (NPS-FM).

Successful watershed management relies on agreeing desired water outcomes and actions with the many stakeholders interested in water management. In Auckland, some challenges for this process include:

- Auckland's size and the number of stakeholders with an interest in water;
- Competing stakeholder interests and priorities and how to represent them all fairly;
- Uncertainty about the future, including possible changes in climate, city growth, city finances, land use, community expectations and legal requirements.

Robust, considered engagement with stakeholders is vital for addressing these challenges. However, it is difficult to manage the size and complexity of engagement on water management without a common frame of reference.

To address this, Auckland Council is developing GIS-based integrated watershed plans. This paper describes how watershed plans support stakeholder engagement for NPS-FM implementation.

KEYWORDS

Water quality, freshwater, integrated catchment management, watershed, National Policy Statement for Freshwater Management 2017, engagement, stakeholder

PRESENTER PROFILE

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1 INTRODUCTION

1.1 NPS-FM REQUIREMENTS AND IMPLICATIONS FOR AUCKLAND COUNCIL

The National Policy Statement for Freshwater Management 2014 (updated 2017) (NPS-FM) requires Auckland Council to set freshwater objectives and quality and quantity limits or targets within the Auckland Unitary Plan (Operative in Part) (AUP-OP).

As a unitary authority, Auckland Council is responsible for both implementing the planning aspects of NPS-FM, and for stormwater infrastructure delivery. Auckland Council's role in infrastructure provision is an extra driver to ensure that changes to the AUP-OP are practical to implement. For example, if Auckland Council introduces a reduced contaminant load target in a catchment through a plan change, it needs to ensure that existing or future stormwater infrastructure can contribute to the load reduction within a realistic budget.

Like other regional authorities, Auckland Council is also required to either enforce NPS-FM driven plan changes through consenting or bylaws, or carry out ratepayer-funded initiatives aimed at improving the quality of discharges into a catchment.

1.2 NPS-FM IMPLEMENTATION THROUGH INTEGRATED WATERSHED PLANNING

Auckland Council is carrying out "integrated management of fresh water and the use and development of land in whole catchments" as described in Objective C1 of the NPS-FM (NZ Government, 2017) as part of the objective, target and limit-setting process described in the previous section.

A key point of difference in Auckland Council's approach compared to other councils is the use of large scale watersheds rather than river catchments for planning, as described later in this paper.

1.3 THE ROLE OF ENGAGEMENT IN INTEGRATED WATERSHED PLANNING

Engagement with stakeholders and mana whenua is a critical part of integrated watershed planning.

The use of feedback received from engagement ensures that watershed plans reflect what stakeholders want for their waterways, and the ability of those stakeholders to achieve the desired watershed outcomes. The United States Environmental Protection Agency emphasises the importance of stakeholder involvement, as "implementation of the plan usually rests with the community, and if they are involved up front and see that their concerns are being addressed, they will be more likely to participate in developing management options and supporting plan implementation" (USEPA, 2008).

Engagement is required for different purposes in each of the three stages of Auckland Council's integrated watershed planning process, as discussed in later sections.

1.4 THE NEED FOR TOOLS FOR ENGAGEMENT

Given the size and diversity of Auckland's watersheds, engagement is challenging without tools to assist the process. Auckland Council has developed integrated watershed plans using ESRI Story Maps as the main tool to support engagement.

1.5 STRUCTURE OF THIS PAPER

This paper discusses:

- An overview of Auckland Council's integrated watershed planning process
- An overview of Auckland Council's approach to engagement and the engagement activities being undertaken in each stage of integrated watershed planning
- The challenges for engagement in integrated watershed planning
- How creating GIS-based, interactive watershed plans using ESRI Story Maps has assisted Auckland Council with engagement
- Conclusions, feedback and lessons learnt from the development of watershed plans using Story Maps.

2 INTEGRATED WATERSHED PLANNING

A watershed is the area of land which contributes all of the natural run-off to a particular waterbody, such as a lake, river, estuary or harbour or coastline. Auckland Council has defined ten watersheds that drain to Auckland's harbours or major coastal waters (Figure 1). Although the NPS-FM mainly guides the management of freshwater, Auckland's harbours and coastal environments have been chosen as a high-level planning unit due to Auckland's lack of large rivers, and the significance of Auckland's coastal environments to Aucklanders. However, when necessary to achieve particular freshwater outcomes, these watersheds can be broken down into smaller scale catchments in order to apply more targeted management interventions.

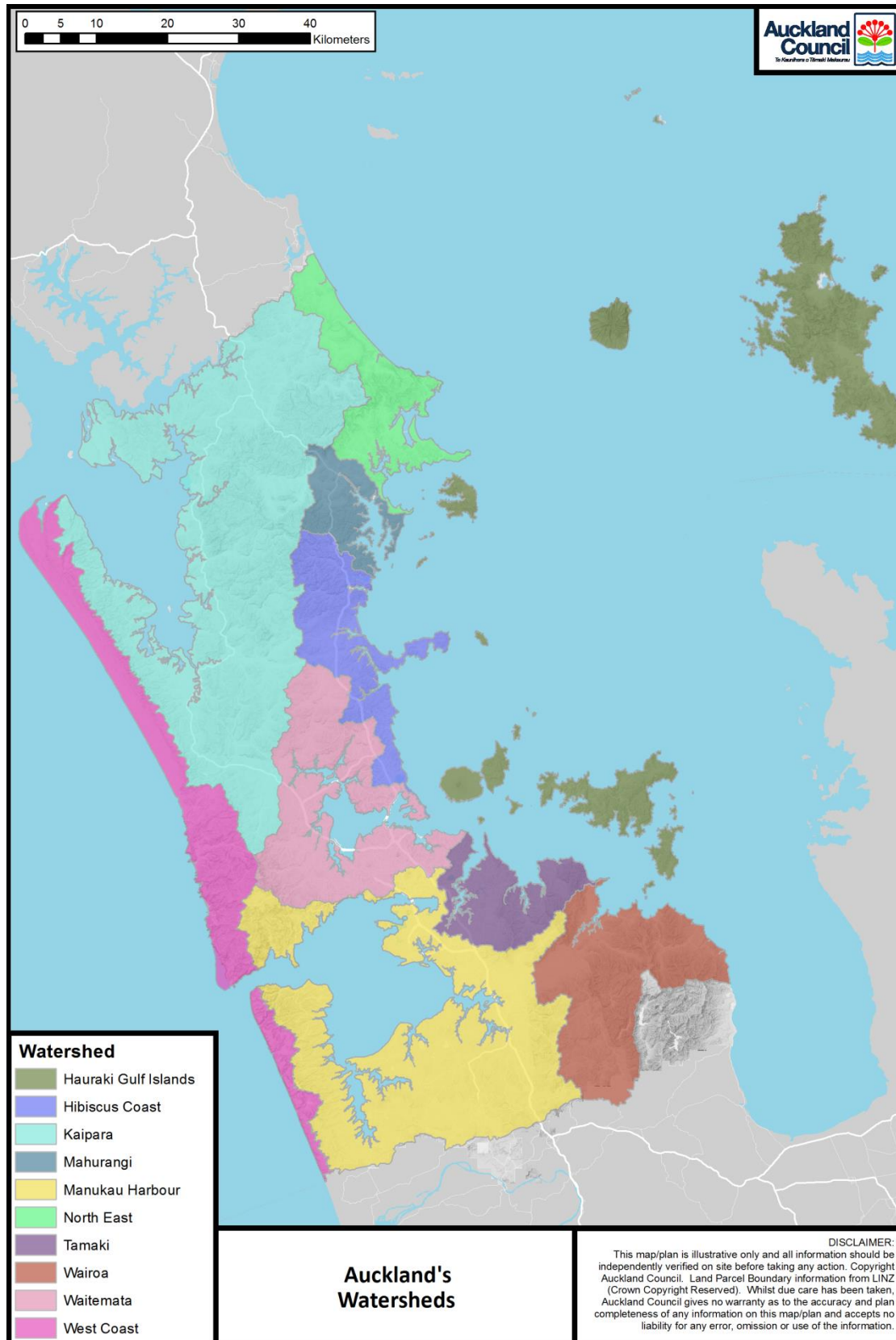


Figure 1: Auckland's Watersheds

Integrated watershed planning is a shared planning effort to manage land and water for improved water outcomes at a watershed level. The need to consider the environment in its entirety is captured by a concept referred to by Maori as "ki uta ki tai", meaning "from the mountains to the sea". It considers all components of the water cycle, both surface and ground waters, and the interactions between them. Integrated watershed plans

consider stakeholders' values for water within the watershed and the issues that need to be managed to meet these values. They include a plan for improving water and land management to meet desired water outcomes.

Auckland's watershed plans are being developed in three stages.

1. *Current State*. The Current State section of the watershed plans will represent the current state of freshwater, groundwater, estuaries and coastal water in Auckland.
2. *Options Analysis*. This stage will present draft objectives for water and a set of options for managing water to reach these objectives.
3. *Watershed Action Plans*. The action plans will set out the actions to be undertaken to meet the objectives that were agreed in *Stage 2 – Options Analysis*. The actions are likely to contain a mix of regulatory changes, infrastructure projects, community projects and behavior change projects (such as incentives and education).

3 OVERVIEW OF ENGAGEMENT IN INTEGRATED WATERSHED PLANNING

3.1 AUCKLAND COUNCIL'S APPROACH TO ENGAGEMENT IN NPS-FM IMPLEMENTATION

Auckland Council is using enhanced engagement through integrated watershed planning to support standard consultation during plan changes to implement the NPS-FM.

The standard consultation process can be effectively strengthened with enhanced engagement. This may involve working with stakeholders to make sure that their concerns are reflected in decisions; or the development of a draft plan released for an informal feedback stage prior to the notification of the plan. Enhanced engagement enables Auckland Council to hear from stakeholders who would otherwise not be able to or want to engage in a statutory process, and was the process followed to develop the AUP-OP in 2012 and 2013.

Enhanced engagement through integrated watershed planning is appropriate for addressing complex issues such as obtaining feedback about a draft plan or canvassing a range of views early in a longer planning process. Through this engagement the identification of potential issues needing to be considered in the next stages of planning can occur.

In the context of implementing the National Policy Statement for Freshwater Management, the engagement process will identify options for objectives and limits for water quantity and quality to be incorporated into the AUP-OP. This will be achieved through the development of integrated watershed plans, with input from stakeholders, and through making these publically available at intervals throughout the process (Mcilroy & Benge, 2018).

Engagement is being undertaken to support the three stages of integrated watershed plan development as described in the previous section.

3.2 THE ROLE OF KEY STAKEHOLDERS IN ENGAGEMENT

A key stakeholder is any person or group who has a high degree of interest and influence over the NPS-FM implementation programme. As part of its enhanced engagement approach to support NPS-FM implementation, Auckland Council is engaging with key stakeholders by setting up stakeholder interest groups to reflect common interests within that group.

These stakeholder interest groups are being involved at all stages of the watershed planning process, as described in the sections below.

3.3 ENGAGEMENT IN STAGE 1 – CURRENT STATE

In Stage 1 of the watershed planning process, Auckland Council's initial engagement was focused on identifying the key stakeholders in NPS-FM implementation.

Auckland Council then drew on feedback received during previous public consultation to develop a draft set of values for water, which has been confirmed with key stakeholders and mana whenua. Ongoing engagement will prioritise values and identify where in a watershed they apply.

To obtain input into other aspects of current state, Auckland Council has engaged with key stakeholders to discuss water management issues, and attributes that could be used to measure water values and water management issues.

Stage 1 – Current State engagement is nearly complete.

3.4 ENGAGEMENT IN STAGE 2 – OPTIONS ANALYSIS

Auckland Council will be engaging with key stakeholders to inform the development of a range of draft water management scenarios, and draft water objectives, limits and/or targets.

Engagement for Stage 2 – Options Analysis will be starting in the second half of 2018.

3.5 ENGAGEMENT IN STAGE 3 – ACTION PLANS

In 2020, consultation will be undertaken as part of future changes to the AUP-OP to implement freshwater objectives and limits. This will give all Aucklanders the opportunity to provide feedback on the proposed plan changes.

4 CHALLENGES FOR ENGAGEMENT IN INTEGRATED WATERSHED PLANNING

4.1 THE NUMBER OF STAKEHOLDERS WITH AN INTEREST IN WATER

Auckland has 19 mana whenua groups, diverse land uses and activities, and the largest constituent population of any local government body in Australasia. Auckland is also one of the most culturally diverse cities in the world, containing more than 220 separate ethnic groups (Statistics NZ, 2016). Engaging with Auckland's mana whenua and stakeholders requires substantial resourcing for outreach and to manage and incorporate potentially high volumes of feedback.

4.2 COMPETING STAKEHOLDER PRIORITIES AND HOW TO REPRESENT THEM ALL FAIRLY

Where there are conflicts between priorities for water management between different stakeholders, there is potential for watershed planning to develop outcomes that preserve the status quo in order to avoid conflict and litigation (Sabatier et al, 2005). Challenges to engaging effectively for good water outcomes where these conflicts arise include:

- Ensuring that both stakeholders and Auckland Council staff are sufficiently informed about water values and water management issues to engage in a meaningful way
- Representing alternative views within one plan
- Resolving competition between different values for a watershed
- Mediating between different expectations around the minimum standards that should be met.

4.3 UNCERTAINTY ABOUT THE FUTURE

Long term planning of any kind is challenging in Auckland. Auckland's high growth rate prompts frequent changes to projected funding and areas of infrastructure investment. Changes in Auckland's climate, land uses, and stakeholder expectations are also a given, although the nature and degree of these changes is largely unknown.

In addition, recent government communication has indicated that there are likely to be future changes to the NPS-FM, which will change the legal context for planning and engagement.

It is difficult to have meaningful ongoing conversations with stakeholders when the context for these conversations has not been formalised and may change. There is a risk that stakeholders will lose trust when they discover that a conversation that was correct a month ago is no longer correct today.

Also, since Auckland Council's future constraints on delivering outcomes are to some extent unknown, engagement activities need to account for this uncertainty in order to manage stakeholder expectations.

5 USING INTERACTIVE WATERSHED PLANS TO SUPPORT ENGAGEMENT

Using an interactive watershed planning interface can help to address some of the engagement risks identified in the previous section.

Auckland Council has developed a draft watershed planning interface using ESRI Story Maps. Story Maps allow Auckland Council to deliver a live, public interface for viewing watershed plan content that can keep a large number of stakeholders informed at once. After initial engagement has been carried out, stakeholders can be directed to the watershed plans for further information, and to provide feedback. Feedback through the watershed planning website can be automatically filed, saving administrative time for Auckland Council representatives.

An interactive format can allow for presenting multiple viewpoints on an issue within the same plan. Although Auckland Council has not yet used Story Maps for this purpose, it envisages that there will be some occasions where different map overlays or tabbed pages could be used to explore different stakeholder's viewpoints. This avoids the need to present only one viewpoint, and allow planners to move forward with stakeholders without needing to resolve irreconcilable differences in opinion.

A Story Map also provides a readily available resource for communicating conflicting management priorities clearly to stakeholders and decision-makers, if and when a final decision needs to be made.

Story Maps can reduce the complexity of face to face interaction, by providing a tool to support discussions. Many stakeholders will also explore the plans independently, and come to meetings better informed.

The ability to easily update the watershed plans with new information gives Auckland Council the ability to be transparent around incorporating and communicating any changes as they occur. Provided that stakeholders understand that the watershed plans will continue to change over time, the plans can serve as a trusted source of current information.

6 OVERVIEW OF WATERSHED PLAN STORY MAPS

Story Maps are online, interactive documents that combine maps with text, images and multimedia to tell a story. They are relatively straightforward to create by a developer with intermediate GIS skills, as they are developed from a pick list of templates with preset options and do not require any web coding ability. Their ability to update GIS data in real time can reduce the risk of information becoming out of date, and reduce the time involved in carrying out revisions.

Auckland Council has developed draft content for Stage 1 – Current State. The Current State Story Maps present customised maps alongside text and images to explain Auckland's freshwater values, water management issues and current water interventions. The website-like format of the Story Maps means that viewers can intuitively navigate through different tabs and explore content by clicking on locations within maps. Viewers can drill down from a high level overview of a value or water management issue, into the details of how it applies at a site or subcatchment level.

The plans interpret information for all stakeholders to build a common understanding that will support the process of negotiating and agreeing on desired water outcomes.

The value of ecosystem health, and how it is affected by sediment in waterways, is presented below as an example.

Figure 2 shows the use of text and map data within the Story Map page to discuss the freshwater ecosystems within Waitemata watershed. Viewers can click on features within the map to find more information, such as that shown for the highlighted river example.

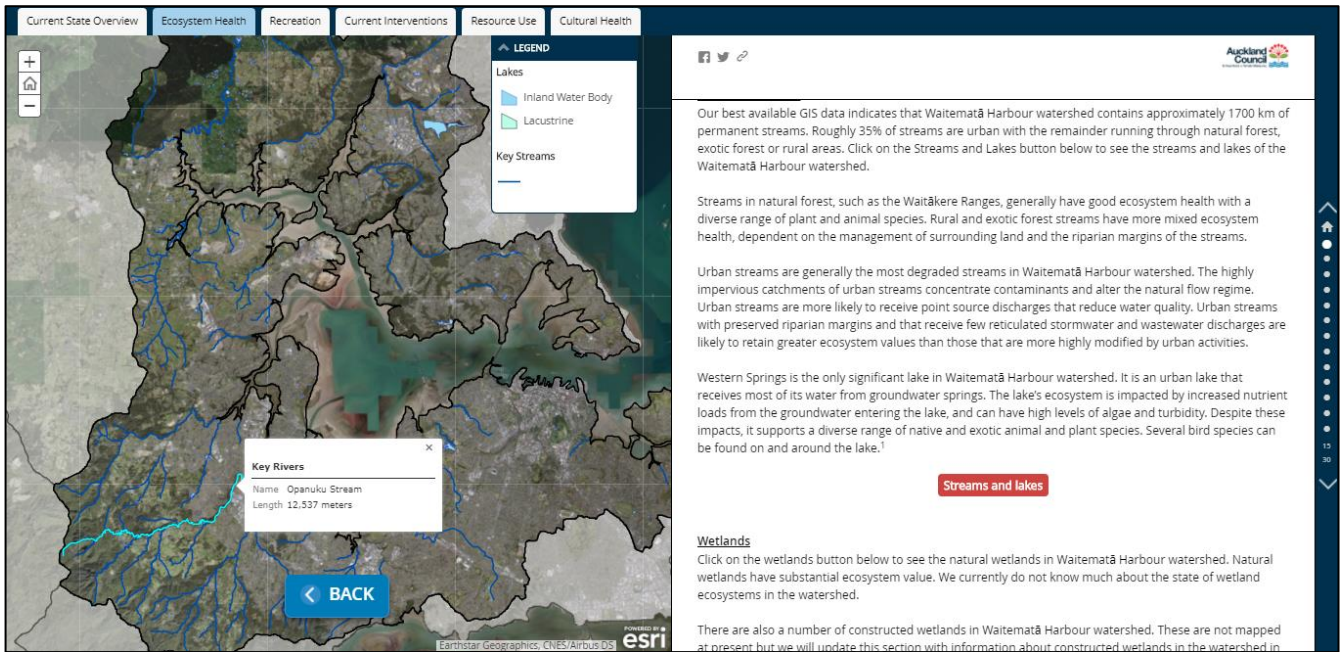


Figure 2: Overview of Stream and Lake Ecosystems in Waitemata Watershed

Figure 3 gives a brief overview of the effects of sediment on watershed ecosystems.

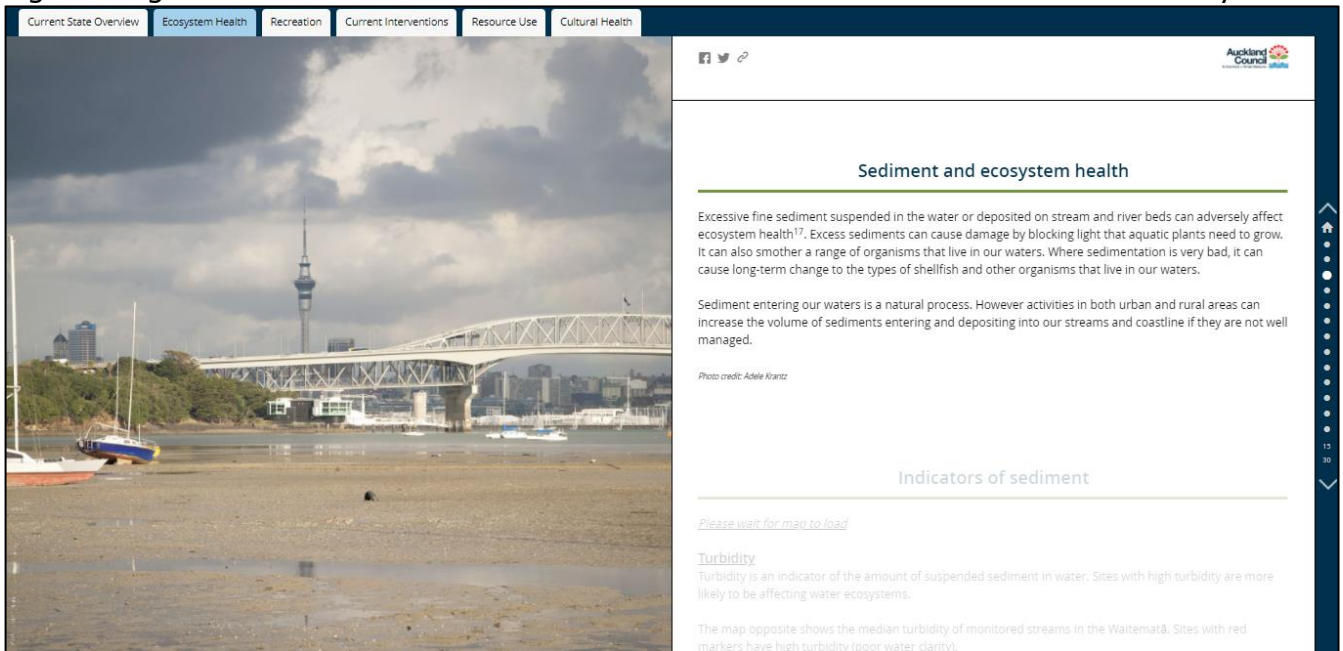


Figure 3: Overview of the Effects of Sediment on Ecosystems in Waitemata Watershed

Figure 4 gives an analysis of monitoring data that show the watershed’s sediment issues. Sites are ranked as to whether or not they are failing the best available environmental guidelines for ecosystem protection. Since the NPS-FM does not currently include any sediment quality criteria, the Australia and New Zealand Guidelines for Fresh and Marine Water Quality (2000) have been used in this case. However, Auckland Council has used the NPS-FM “attribute states” to identify the degree of degradation for attributes that are included in the NPS-FM, such as nitrogen and E. coli.

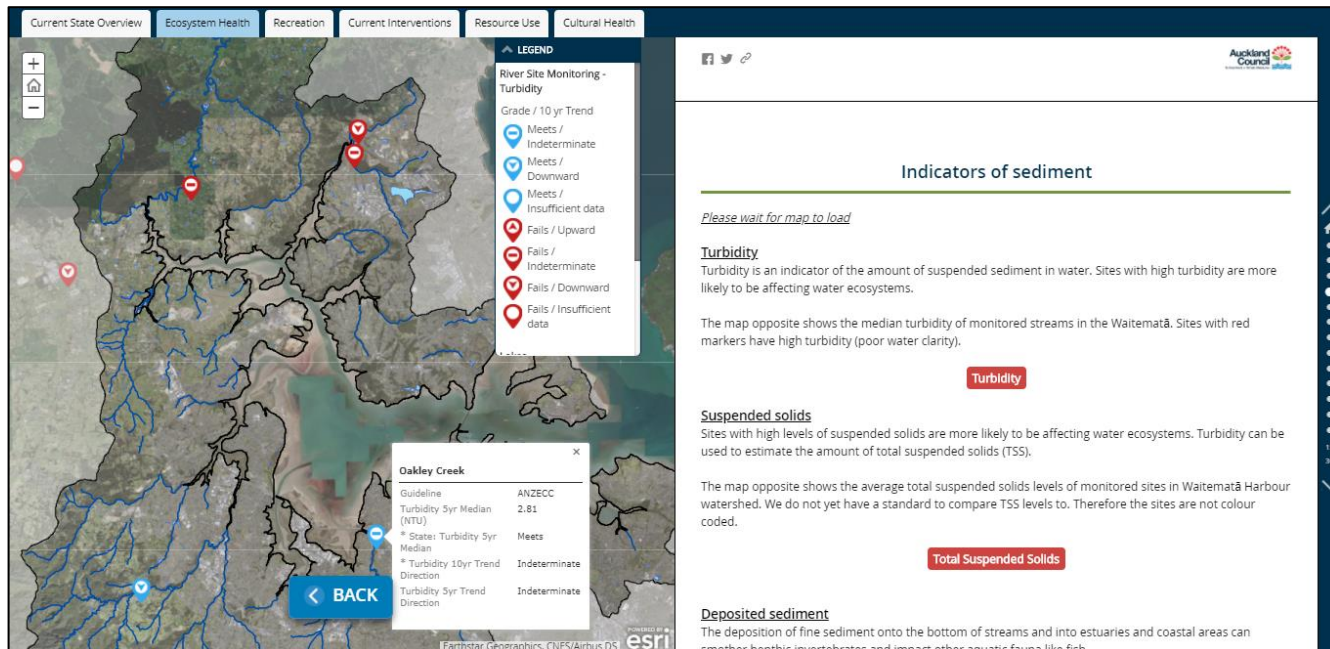


Figure 4: Turbidity Data for Monitoring Sites in Waitemata Watershed

Figure 5 is an example of how the issue of sediment contamination has been explored within the watershed plan. The land disturbances arising from urban growth have been identified as a contributor to sediment loads within Auckland’s urban watersheds. Earthworks consents data has been used here as a proxy for the amount of development occurring within a catchment, to give an indication of which catchments are at higher risk of increased sediment loads, should earthworks activity be poorly managed.

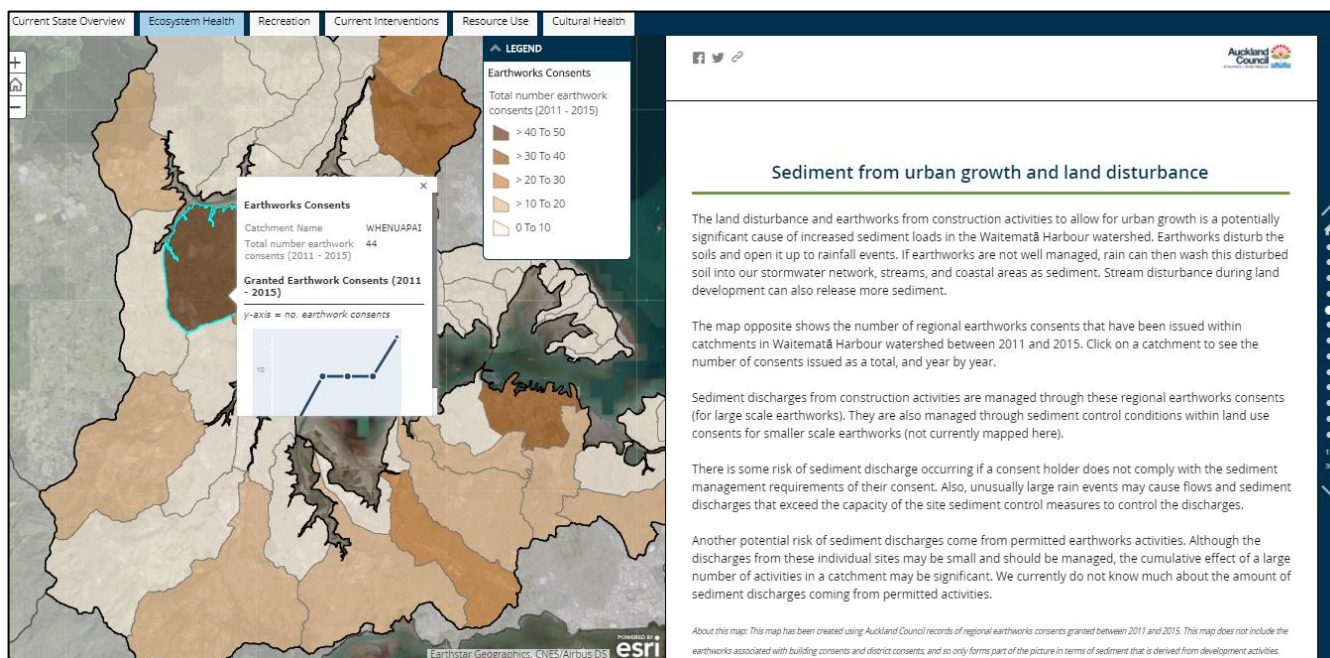


Figure 5: Sediment Loads from Urban Growth in Waitemata Watershed

Figure 6 illustrates another issue affecting sediment contamination – rural land management practices. The catchment loads here were obtained from the Catchment Land Use for Sustainability (CLUES) model.

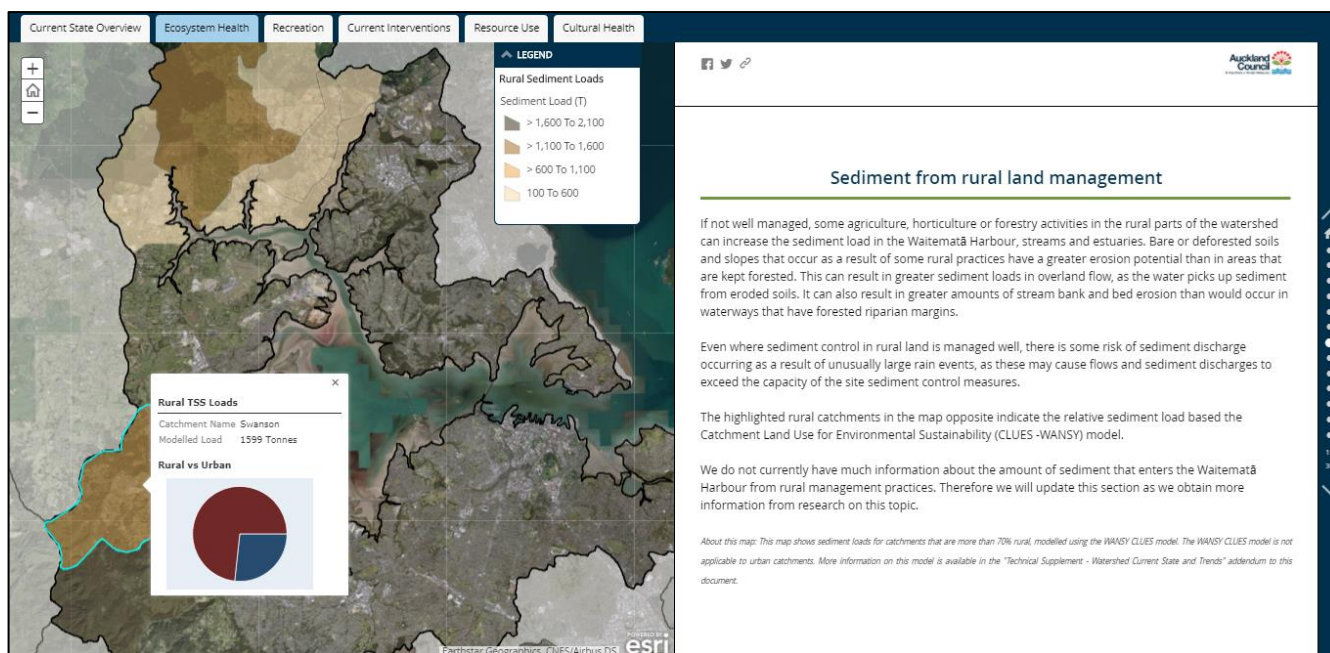


Figure 6: Sediment Loads from Rural Land Management in Waitemata Watershed

Auckland’s 10 draft watershed plans, released in November 2017, can be found at <https://aucklandcouncil.maps.arcgis.com/apps/MapJournal/index.html?appid=13c6b96541884d8099da216a2206a2d0>.

Auckland Council is currently refining the Current State and developing content for Stage 2 – Options Analysis.

7 CONCLUSIONS

7.1 BENEFITS OF USING AN ON-LINE GIS WATERSHED PLANNING TOOL

ESRI Story Maps are a useful tool to support engagement in watershed planning and implementation of the NPS-FM. The main types of benefits of using a live, public, GIS-based interface of this kind instead of a static watershed planning document are:

- Better information accessibility
- Improved stakeholder interest and understanding
- Reduced need to resolve conflicts in viewpoints
- Ability to respond quickly to change
- Ability to communicate change transparently
- Ability to integrate large volumes of information in one place.

7.2 FEEDBACK ON THE WATERSHED PLANNING TOOL

A first draft of the watershed planning tool was tested with Auckland Council and Council Controlled Organisations staff, and mana whenua representatives in July 2017. Feedback was generally positive and constructive.

Most users found the Story Maps easy to use, intuitive, and well presented. The structure made it easy to understand a large volume of data about water management issues. Less text and more photos and diagrams could potentially communicate the issues more clearly. More functionality to overlay maps could give a user more integrated view of issues.

Some users suggested that they could be a powerful tool to support behaviour change by highlighting the cumulative impacts of activities on water. More information and focus on the key challenges and how they were being addressed would be useful.

The feedback indicated that there is a need for more accessible information and that Story Maps can meet most users' expectations for exploring information to understand water management issues in a number of different contexts.

7.3 LESSONS LEARNT

The main lessons learnt are summarised in the points below.

- Establish the main project drivers. Once the engagement needs for NPS-FM implementation emerged as the main driver for the Story Map development, extra content that was intended to serve other business needs could be removed, and the structure could be simplified.
- Identify the project team at the start of development and consistently involve them through all stages of design and building of the Story Maps.
- Scope the watershed plans as much as possible on paper before building within Story Maps. Iterative review can be carried out more quickly on paper than if it were done while building within Story Maps.

- Be aware of Story Map limitations and potential technical difficulties. Check that the appropriate technical support is available for development, and that the functionality and formatting of Story Maps will meet business needs.
- Make use of the interactive and multimedia functionality of Story Maps. They are powerful ways to add to your messaging.
- Make a paper version as well. Content review is best carried out on a paper version as there is no review functionality within the Story Maps.

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