

# RURAL WATER QUALITY STRATEGY 2011

A new approach to water contamination  
from runoff, drains, and leaching



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## INTRODUCTION

The impacts of water contaminants in runoff, drainage, and leaching (known as non-point source pollution) present one of the most serious freshwater management challenges in New Zealand.

Water quality deterioration can significantly affect community welfare and undermine future community development. Good water quality is essential to everyone's prosperity.

Previous council and industry responses to polluted runoff, mostly through input controls, have not been sufficient to respond effectively to the deterioration of water quality in some Otago rivers from non-point sources (runoff, leaching, and farm drains).

Generally in New Zealand, non-point source discharges are managed by controlling how land is used, such as separating farming activity from watercourses, limiting stock rates, or restricting the amount of fertiliser or effluent applied to land. Despite this management, some water quality continues to be compromised, particularly in areas where land use has intensified significantly.

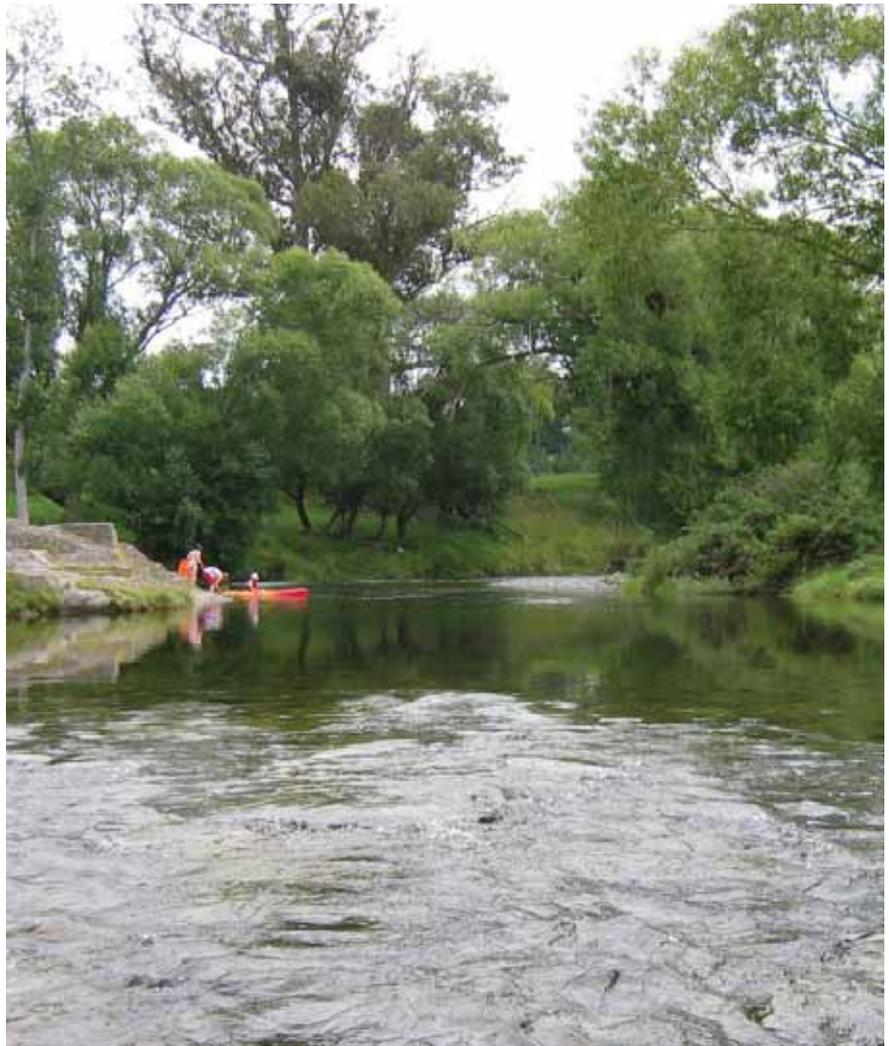
The management of non-point source pollution has complex components in which many parties are involved. To meet this challenge, ORC proposes innovative responses focused on effects-based management. In partnership with land users, ORC will focus on managing diffuse contaminants through conditioned permitted activities.

This brochure backgrounds the non-point source water contamination issue and introduces the proposed effects-based management of polluted runoff. It explains how farmer stewardship can bring about good farming solutions to dealing with polluted runoff, and how local knowledge and farming industry actions can make a difference to freshwater quality in Otago.

I hope the strategy in this brochure will stimulate feedback. Your knowledge will help to further shape council's approach to improving water quality in Otago.

A handwritten signature in black ink that reads "S Woodhead". The signature is written in a cursive, flowing style.

**Stephen Woodhead**  
Chairman  
Otago Regional Council



## VISION FOR WATER QUALITY

*'Otago will enjoy safe and healthy water resources which everyone can use and appreciate'.*

## KEY OBJECTIVES

- ▶ The quality of Otago's freshwater resource will be such that people can safely swim in it.
- ▶ Water quality will be maintained in waterways where it is still good, and significant improvements should be made where water quality has deteriorated.
- ▶ Economic use of productive land will continue, benefiting both farmers and the regional community.

## RURAL WATER QUALITY IN OTAGO

The quality of Otago's freshwater resources is generally very good. A high standard of water quality is a valued feature of Otago's rivers and lakes.

Good water quality supports a wide range of uses, such as irrigation, recreation, industry, energy production, domestic and public water supply, and tourism. It is essential for sustaining healthy waterways which support a wide range of flora and fauna.

However, water quality in some parts of Otago has deteriorated due to intensification of farming. More intensive farming means that pollution from non-point sources is increasingly being identified in Otago's rivers and lakes.

### How does drainage, runoff, or leaching from agricultural land become pollution?

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Contaminated or polluted runoff (often known as diffuse or non-point source pollution) results from land runoff, drainage, and seepage, which in turn emanates from irrigation of saturated soils, rainfall, flooding, or modification to waterways.

In farming areas these activities can carry contaminants such as sediment, microbes, nitrogen, and phosphorous into lakes, rivers, wetlands, and groundwater.

Nutrients can promote algal growth and create health concerns if swallowed. Microbes create similar health concerns, while sediment discolours water and buries river bed habitats.

### How are point source and non-point source contamination different?

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Point source contamination comes from identified sources, such as the pipes discharging from factories and wastewater treatment plants.

Non-point source pollution comes from a variety of less obvious sources such as uncontrolled surface runoff, groundwater seepage, or sub-surface drains.

The most significant difference between non-point source and point source contamination is that the aggregate of many minor non-point source discharge contaminants can have cumulative effects greater than those of the point sources.



## Non-point source pollutants that can come from urban and rural activities include:

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- ▶ Fertilisers and other nutrients, herbicides, and insecticides
- ▶ Oil, grease, and other toxic chemicals
- ▶ Sediment
- ▶ Bacteria and viruses
- ▶ Organic matter
- ▶ Heavy metals

## What has been done so far to deal with poor water quality?

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Good progress has been made in improving discharge quality from point sources. Some Otago city and district councils have made major investments to improve their water discharges. Many of Otago's major industries have also made substantial investments in water treatment facilities, ensuring that the water discharged can safely be used for recreation.

## Why is polluted runoff a problem in Otago?

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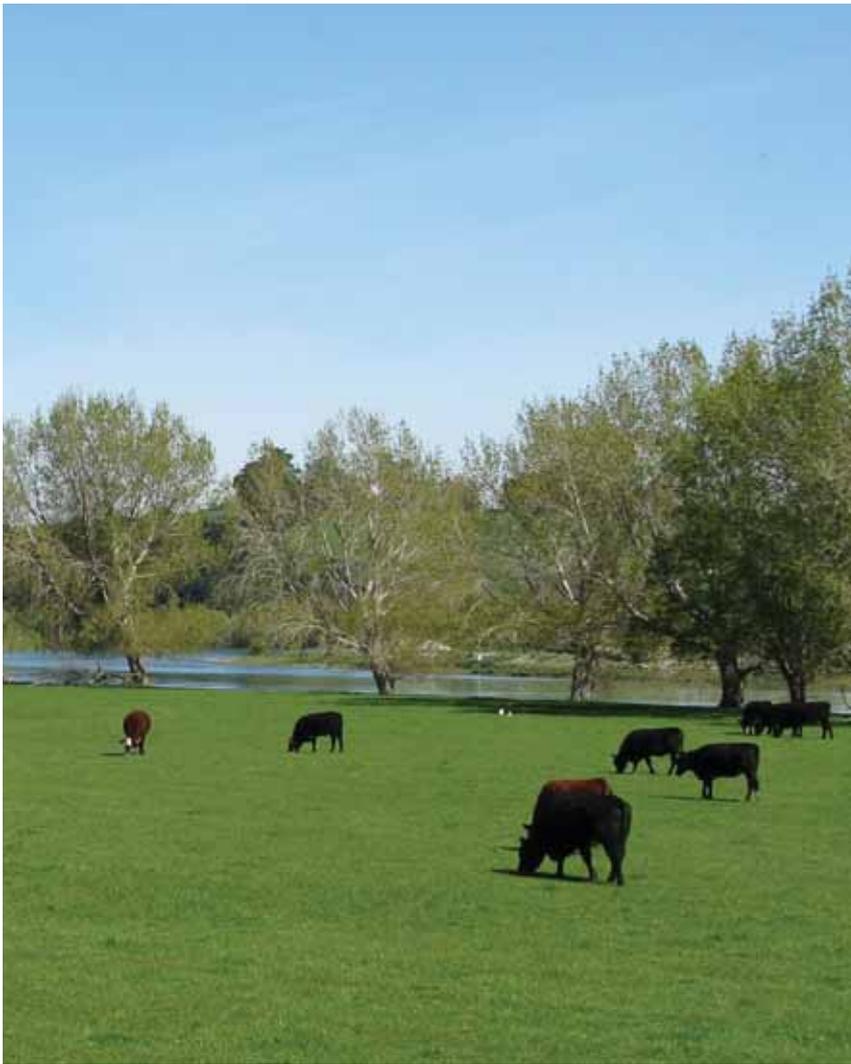
The quality of Otago's freshwater is generally very good in major rivers, such as the Clutha/Mata-Au.

However, as land use intensifies in parts of Otago, the amount of contaminants available to travel into waterways grows.

In some areas, the local water quality has become degraded, and may no longer meet community or ecological expectations. Maintenance of water quality is crucial for Otago's prosperity.

Polluted runoff has a range of effects depending on the specific water body. The most significant impacts are:

- ▶ Transmission of bugs into drinking and recreation water
- ▶ Serious risk to human health as a result of using polluted water
- ▶ Contaminated fisheries and wildlife
- ▶ Pollution of downstream water through contaminant accumulation.



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Non-point source pollution presents a real management challenge due to its diffuse nature and chronic impact.

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## MANAGING NON-POINT SOURCE POLLUTION

Non-point source pollution presents a real management challenge due to its diffuse nature and chronic impact.

Generally in New Zealand, non-point source discharges are managed by controlling how land is used - separating farming activity from watercourses, limiting stock rates, or restricting the amount of fertiliser or effluent applied to land.

However, water continues to be polluted by non-point source contaminants where farming is significantly intensified.

The movement and dynamics of non-point source pollutants are recognisable but complex to treat. Avoiding contaminated runoff is challenging for everyone involved in land management.

A different focus is needed to successfully embrace our current water quality problems, as well as future land-use challenges.

## A NEW EFFECTS-BASED DIRECTION FOR ACHIEVING WATER QUALITY IN OTAGO

The council's goal is to control the level of contaminants in discharges from rural land, while at the same time providing for agricultural uses, and flexibility in achieving those limits.

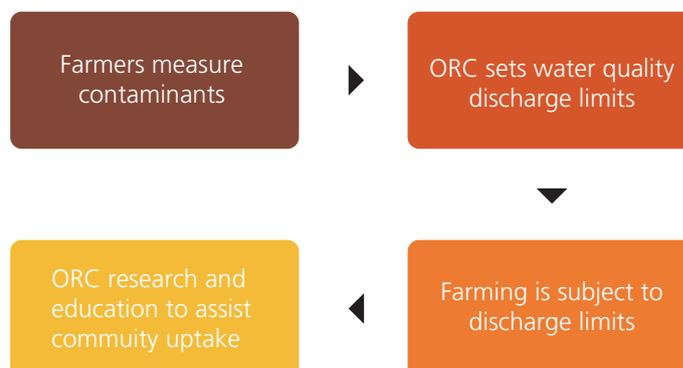
The proposed new direction for water quality is based upon a system of self-management by farmers, allowing them flexibility, and encouraging them to manage their discharges in innovative ways.

The strategy is mainly concerned with directly managing land use discharge quality, rather than controlling farming activities. This is how it works:

- ▶ Community consultation defines water quality values
- ▶ Contaminant limits relating to water quality will be set for discharges from land (including surface runoff, groundwater seepage, or discharge from drains) based on the identified values.
- ▶ Farmers will choose for themselves which land use actions are necessary to meet the required limits.
- ▶ External advice and guidance will be available for those who have difficulty in achieving the limits.
- ▶ A transitional period and easy methods of measuring the quality of discharges from land will be crucial to achieve the limits.
- ▶ Measure water discharge quality from land so that farmers find out when, where, and how non-point source discharges from their land may exceed the limits so that they can adjust their farming methods.

This approach (illustrated below) aims to allow farmers flexibility, and encourages them to take on-farm actions to manage water discharge limits.

The strategy provides a long-term solution, balancing acceptable water quality with community expectations and aspirations.



## WATER QUALITY PRINCIPLES

### Encourage farmer stewardship

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A key aim of this strategy is to enable Otago's farmers to manage what happens on their land and enable agricultural land use, whilst addressing water quality effects of rural land use.

ORC is aware that Otago farmers have a strong sense of stewardship about how they manage their land, and that they regularly develop quality solutions to the on-farm issues they face.

The council's effects-based approach acknowledges rural realities in Otago and creates room for farmers' innovative thinking to implement what is their best way to avoid polluted runoff.

### Utilise local knowledge

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Many farmers have considerable knowledge of how their activities interact with the natural environment.

Farmers and their advisers will be able to build upon this knowledge, about how their operations influence the level of contaminants in discharge from their land, and implement the ways that best suit their farm to deal with:

- ▶ major sources of contaminants
- ▶ understanding how contaminant levels in discharge vary in relation to different stocking levels, management techniques, and weather patterns
- ▶ where (and how much) discharge is entering waterways
- ▶ implementing quality land use practice such as fencing streams, reducing nitrogen applications, leaving uncultivated riparian strips, and investing in modern effluent collection, storage and irrigation plant.

### Individual responsibility for discharges

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Knowledge gained from measuring contaminants will allow better understanding of the link between farming practices and water quality.

This knowledge and the water limits set for streams and rivers will require that each farmer becomes responsible and accountable for any excess pollution caused by their land use. The council plans to put appropriate mechanisms in place to ensure this change can happen fairly and reasonably.



## On-farm flexibility

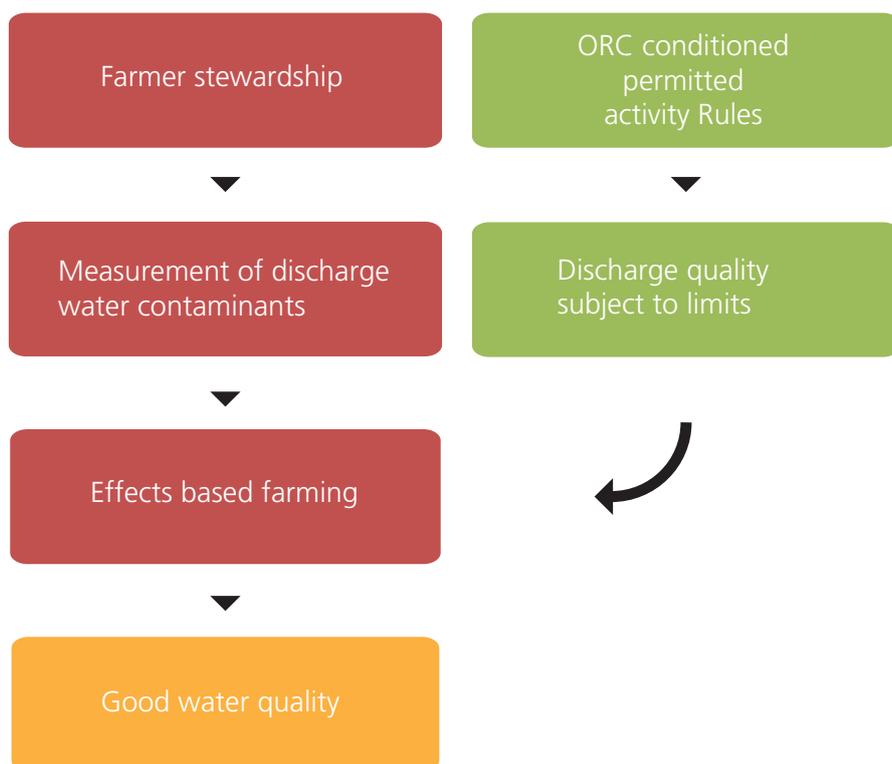
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Farmers are free to choose their own quality solutions for reducing contaminants in discharges to water, based on their own knowledge and preferences.

These solutions may be simple, (e.g., reducing nutrient inputs to the land, leaving uncultivated riparian strips and fencing waterways), or more high-tech measures to cope with intensive land use (e.g. using effluent collection, treatment and distribution systems and preventing effluent from entering waterways).

The type of response chosen will be up to the individual – however the preferred method will need to ensure that contaminant levels do not exceed the limits set for their particular area.

## PROCESSES TO MANAGE WATER QUALITY



### How will the proposed approach achieve good water quality?

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- ▶ It will set limits for discharge contaminants, including phosphorous, microbes, nitrogen, and sediment;
- ▶ Allow flexibility for the development of quality farming practices to meet the limits;
- ▶ Guide farmers, rather than regulate them, as to how they manage runoff, drainage or leachate;
- ▶ Involve Otago communities in the setting of water quality standards.

### Measuring contaminants

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Measuring the quality of contaminants will allow a better understanding of the link between farming practices and water quality. As farmers increasingly self-manage contaminants, and build their understanding of catchment processes, they will be able to comply with discharge quality limits

## WHAT NEEDS TO BE DONE NOW?

While the Regional Water Plan includes discharge activity rules, changes are needed to better address non-point source pollution.

Making this improvement will involve collaboration and consultation involving a range of interested parties, and a re-appraisal of water quality provisions in the Regional Water Plan

Farmers' willingness to adopt and test new tools and, where appropriate, adapt quality farming practices, is a crucial part of the process.

This proposed rural water quality strategy is built on the following steps for implementation.

## IMPLEMENTATION

### Incorporating science

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- ▶ Catchment-specific studies show the effects of land use on water quality. This information will support the regulatory framework by determining the way contaminants are managed.
- ▶ Collecting initial information about nutrient, microbe and sediment levels in discharges from land (including surface runoff, drains, and groundwater leachate).
- ▶ Ongoing council monitoring will identify water quality trends and problematic areas.

### Tackling the environment along with stakeholders

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- ▶ ORC will work with key parties (such as farmers, industry and iwi) to ensure the approach is practical and fits comfortably with their expectations. This will include a series of forums for key parties.
- ▶ ORC will demonstrate to farming groups the means of measuring contaminant levels in discharge from land.
- ▶ Policy development will draw together and recognise the social, economic, environmental and cultural values that people place on our waterways.
- ▶ Public feedback will help further develop the necessary tools, and refine the overall concept.

## WHAT HAPPENS NEXT?



- ▶ ORC runs pilot programmes on a selection of Otago farms to develop measuring practices
- ▶ Further field days and meetings to promote community understanding
- ▶ Use this strategy to alter the Water Plan

ORC will progress work in the following key areas:

### **Assessing discharge quality**

Collecting information about the quality of discharge from land and developing appropriate devices to measure nutrient, microbe, and sediment levels. Determining when, where and how these devices should be used will be as important as encouraging farmers to use them.

### **Understanding catchment processes**

Understanding the movement of non-point discharges under different geographical and land use conditions will improve the accuracy of models used to help make farm management decisions for various contaminants in discharge. This will achieve good water quality and protect defined values.

### **Consultation**

Council will continue discussions and receiving feedback from the community.

### **Defining discharge quality limits**

Limits will be established for contaminants in discharges from land. Contaminants to be managed are likely to include sediment, microbes, phosphorous, and nitrogen. The appropriate limits for contaminants will be determined using monitoring results, catchment modelling, and input from the community.

The limits must reflect the community's expectations for in-stream water quality (such as water is swimmable), while still allowing for reasonable use of land.

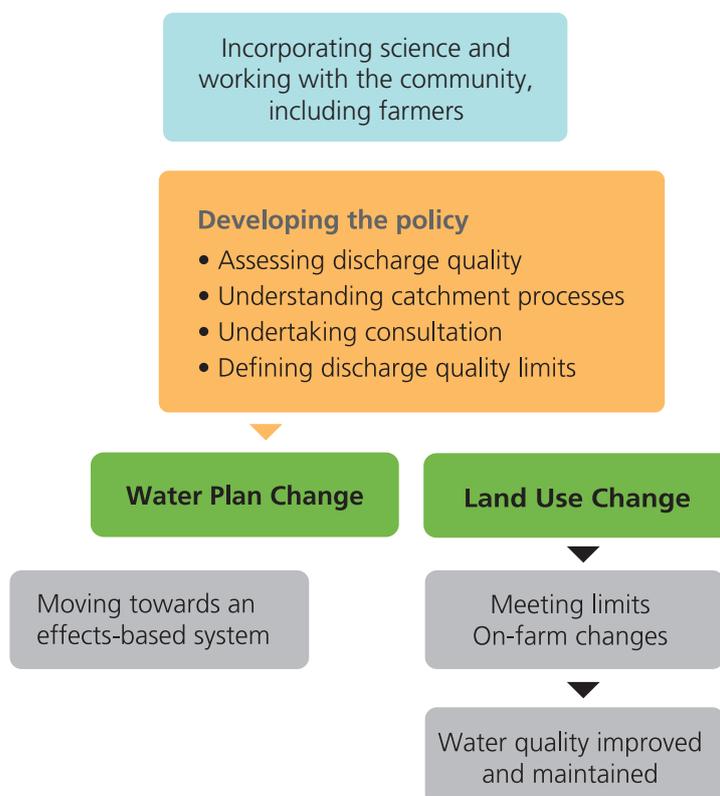
## KEY PARTIES

The success of this strategy, which is unique in New Zealand, is dependent on a number of groups and individuals playing collaborative parts. They include:

Farmers and other primary producers	Sectoral organisations	Otago Regional Council
Making land use and farm management decisions to work towards reducing contaminants in discharge	Includes Federated Farmers, Fonterra, fertiliser suppliers, and farm consultants supporting farmers as they make any necessary changes	Research, ongoing monitoring, education, setting limits and enforcement of the limits
Communities and other interest groups (including iwi)	Research & development organisations	Central government
Communicating what defines good water quality	Developing, fine-tuning and improving scientific solutions and devices for practical contaminant measurement and other technology to assist farm management	Creating opportunities for behavioural motivators Assisting local government implementation with complementary tools

## CHANGES TO THE REGIONAL PLAN: WATER

Changes will need to be made to the Regional Plan: Water to enable the strategy to be implemented. The proposed plan change will set limits for discharging contaminants, such as microbes, phosphorous, nitrogen, and sediment.





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