

PWS-001

WATER

THE MOST OVERLOOKED NUTRIENT IN EVERY INDUSTRY

One drop of knowledge creates expanding understanding.

WATER IS LIFE

KNOWLEDGE CREATES VALUE

AGRICULTURE
HEALTHIER CROPS.
BETTER YIELDS.

AQUACULTURE
HEALTHIER FISH.
STRONGER PRODUCTION.

INDUSTRY
GREATER EFFICIENCY.
LOWER COSTS.

MUNICIPALITIES
CLEANER WATER.
SUSTAINABLE FUTURES.

WATER PROFESSIONALS
BETTER DECISIONS.
BETTER OUTCOMES.

COMMUNITIES
STRONGER TOGETHER.
BETTER TOMORROW.

UNDERSTAND
EVALUATE
DECIDE
IMPROVE
SUSTAIN

PUROXI
PURE WATER GLOBAL INC.

THE PUROXI WATER SERIES
Understanding Water. Improving Outcomes.

KNOWLEDGE EXPANDS
IMPACT MULTIPLIES

WATER IS LIFE | KNOWLEDGE CREATES VALUE | SCIENCE GUIDES US | COLLABORATION STRENGTHENS US | SUSTAINABILITY SECURES OUR FUTURE

THE PUROXI WATER SERIES

PWS-004

Understanding Dissolved Oxygen

Category: Water Science

First Edition | July 2026

Published by Puroxi Pure Water Global Inc.

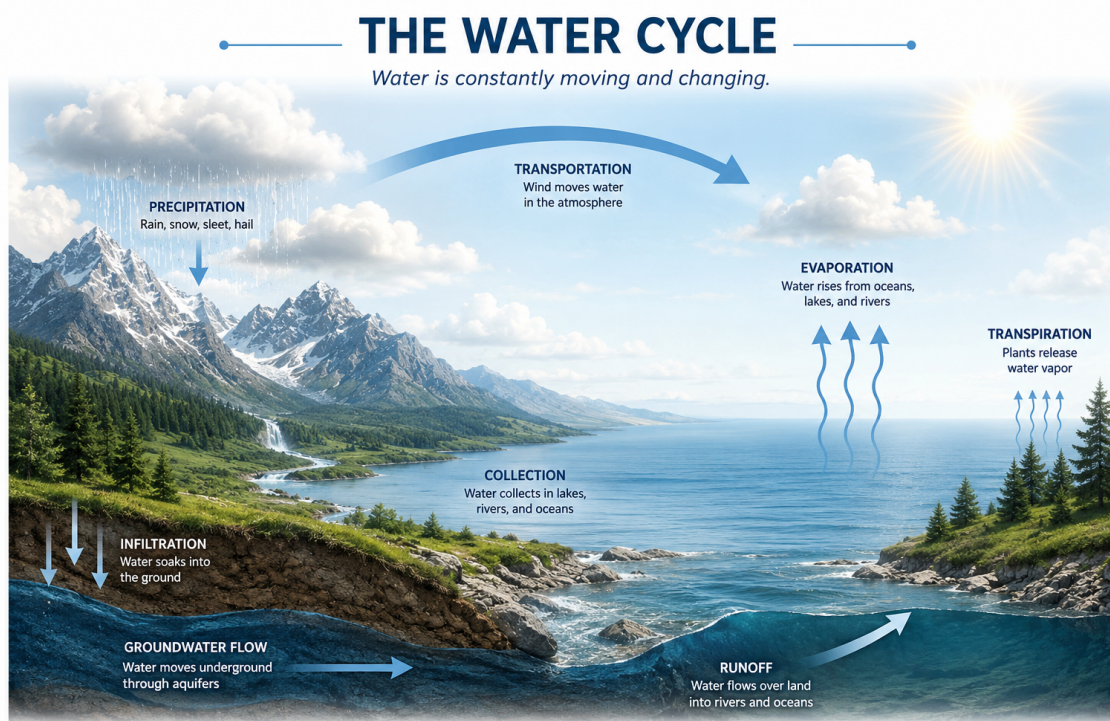
Water Is Life**Knowledge Creates Value**

About the Puroxi Water Series

The Puroxi Water Series (PWS) is an educational publication designed to improve understanding of water through science, practical experience and thoughtful discussion.

AT A GLANCE

- Estimated Reading Time: 15–20 minutes
- Audience: Agriculture • Aquaculture • Municipalities • Industry • Consultants • Students
- Understand what dissolved oxygen really is.
- Learn why dissolved oxygen is essential for healthy water and aquatic life.
- Discover how temperature, biological activity, and dissolved oxygen work together.
- Separate common myths about dissolved oxygen from water science.
- Learn practical strategies for improving and maintaining dissolved oxygen levels.
- Understand the Puroxi philosophy: Understanding Always Comes Before Recommendation.



Why This Publication Matters

Without water, there would be no life. Every person, every animal, every crop, every fish, every forest, and every ecosystem depends upon it. Water is the foundation upon which life itself depends.

Around the world, investment in water treatment, water reuse, and environmental protection continues to grow. Yet one question remains:

Do we truly understand the water we depend upon every day?

One of the most important indicators of water quality is **dissolved oxygen**. Although invisible, it is essential for aquatic life, beneficial microorganisms, natural biological processes, and many of the treatment technologies used to improve water quality.

Dissolved oxygen is often described as the **breath of healthy water** because nearly every living organism in an aquatic environment depends upon it. Fish require it to survive. Beneficial bacteria need it to break down organic matter. Many chemical reactions rely on it to occur efficiently. Without adequate dissolved oxygen, even the clearest water can quickly become unhealthy.

Unlike many water quality parameters, dissolved oxygen is constantly changing. It rises and falls throughout the day, changes with the seasons, responds to temperature, biological activity, water movement, and weather conditions. Understanding these natural changes is essential for anyone responsible for managing water.

This publication has been written to explain dissolved oxygen in clear, practical language. Whether you work in agriculture, aquaculture, municipal water, wastewater treatment, industry, or environmental management, understanding dissolved oxygen is fundamental to understanding healthy water.

At Puroxi, we believe that education is the foundation of good decision-making. Before recommending any treatment technology or solution, we believe it is essential to first understand the science behind the water itself.

Understanding Always Comes Before Recommendation.

About This Publication

Dissolved oxygen is often referred to as the "breath of healthy water," yet it is one of the most misunderstood water quality parameters. Although invisible, dissolved oxygen influences almost every biological and chemical process occurring in water. It supports aquatic life, drives beneficial biological activity, affects chemical reactions, and plays a vital role in drinking water, wastewater, agriculture, aquaculture, industrial processes, and environmental management.

This publication has been developed to provide a practical understanding of dissolved oxygen without unnecessary technical complexity. Whether you are a student learning about water science, a consultant designing treatment systems, a municipal operator managing public infrastructure, or a farmer or aquaculture producer responsible for water quality, the principles explained in this publication apply across a wide range of industries and applications.

Rather than focusing on equipment or products, this publication explains the science behind dissolved oxygen—what it is, how it enters and leaves water, why it changes, how it is measured, and why it is one of the most important indicators of water health.

Throughout this publication, you'll discover that dissolved oxygen should never be considered in isolation. It is closely connected to temperature, biological activity, pH, water movement, and many other factors that influence the health and performance of aquatic systems.

As with every publication in the **Puroxi Water Series**, our objective is simple: to help readers better understand the water they work with every day.

Because at Puroxi, we believe that **understanding always comes before recommendation.**

Table of Contents

Contents

At a Glance 2

About This Publication 2-3

Why This Publication Matters 3-4

Table of Contents 4-5

Chapter 1

What Is Dissolved Oxygen? 5-8

Chapter 2

Why Dissolved Oxygen Matters 8-10

Chapter 3

Where Does Dissolved Oxygen Come From?10-12

Chapter 4

Where Does Dissolved Oxygen Go?13-15

Chapter 5

Temperature and Dissolved Oxygen15-17

Chapter 6

Dissolved Oxygen Across Different Industries17-19

Chapter 7

Measuring Dissolved Oxygen 20-22

Chapter 8

Common Myths About Dissolved Oxygen 22-24

Chapter 9

Improving Dissolved Oxygen 24-26

Chapter 10

What Is Your Water Trying to Tell You? 27-28

Continue the Conversation 29

About Puroxi29- 30

Publication Information30-31

Chapter 1

What Is Dissolved Oxygen?

Water is often described as the universal solvent because it dissolves more substances than any other naturally occurring liquid. Among the most important of these dissolved substances is oxygen.

Dissolved oxygen (DO) refers to the amount of oxygen gas that has dissolved into water and is available for use by aquatic organisms and natural biological processes. Unlike the oxygen we breathe from the atmosphere, dissolved oxygen exists as individual oxygen molecules dispersed throughout the water, making it accessible to fish, aquatic plants, beneficial bacteria, and countless microscopic organisms.

Although oxygen makes up approximately **21% of the Earth's atmosphere**, only a relatively small amount dissolves naturally into water. The amount that does dissolve is influenced by many factors, including temperature, atmospheric pressure, water movement, salinity, biological activity, and photosynthesis.

Because dissolved oxygen cannot be seen, many people overlook its importance. Yet it is one of the most critical indicators of water quality. Healthy dissolved oxygen levels support aquatic life, encourage

beneficial biological activity, and help maintain balanced aquatic ecosystems. When dissolved oxygen levels decline, water quality often declines as well.

One of the most important concepts to understand is that dissolved oxygen is **dynamic**. Unlike many water quality parameters that change slowly, dissolved oxygen can fluctuate significantly throughout the day. Sunrise, sunset, cloudy weather, rainfall, biological activity, temperature changes, and even wind conditions can all influence dissolved oxygen concentrations.

For this reason, dissolved oxygen should never be viewed as a single measurement taken at one point in time. Instead, it should be understood as part of a continuously changing water system where physical, chemical, and biological processes interact with one another.

Understanding dissolved oxygen is one of the first steps toward understanding the overall health of a water body.

Founder's Notebook

One of the first questions people often ask is, "What dissolved oxygen level should my water have?"

The answer is almost always, **"It depends."**

There is no single dissolved oxygen concentration that is ideal for every application. Fish species have different oxygen requirements. Wastewater treatment processes operate within different dissolved oxygen ranges than drinking water systems. Agricultural irrigation ponds behave differently than cold mountain streams.

Rather than searching for one "perfect" dissolved oxygen number, it is far more important to understand **why** the oxygen level is changing and what the water is trying to tell you.

Puroxi Insight

Dissolved oxygen is one of the few water quality parameters that responds almost immediately to changes in the environment. A sudden drop in dissolved oxygen may indicate increased biological activity, excessive organic loading, poor circulation, thermal stratification, or equipment failure. Learning to recognize these changes early can prevent much larger water quality problems from developing.

Did You Know?

Although Earth's atmosphere contains approximately **21% oxygen**, water can only dissolve a relatively small fraction of that oxygen under natural conditions. This is why maintaining healthy dissolved oxygen levels can be challenging, particularly in warm, stagnant, or heavily loaded water bodies.

Practical Tip

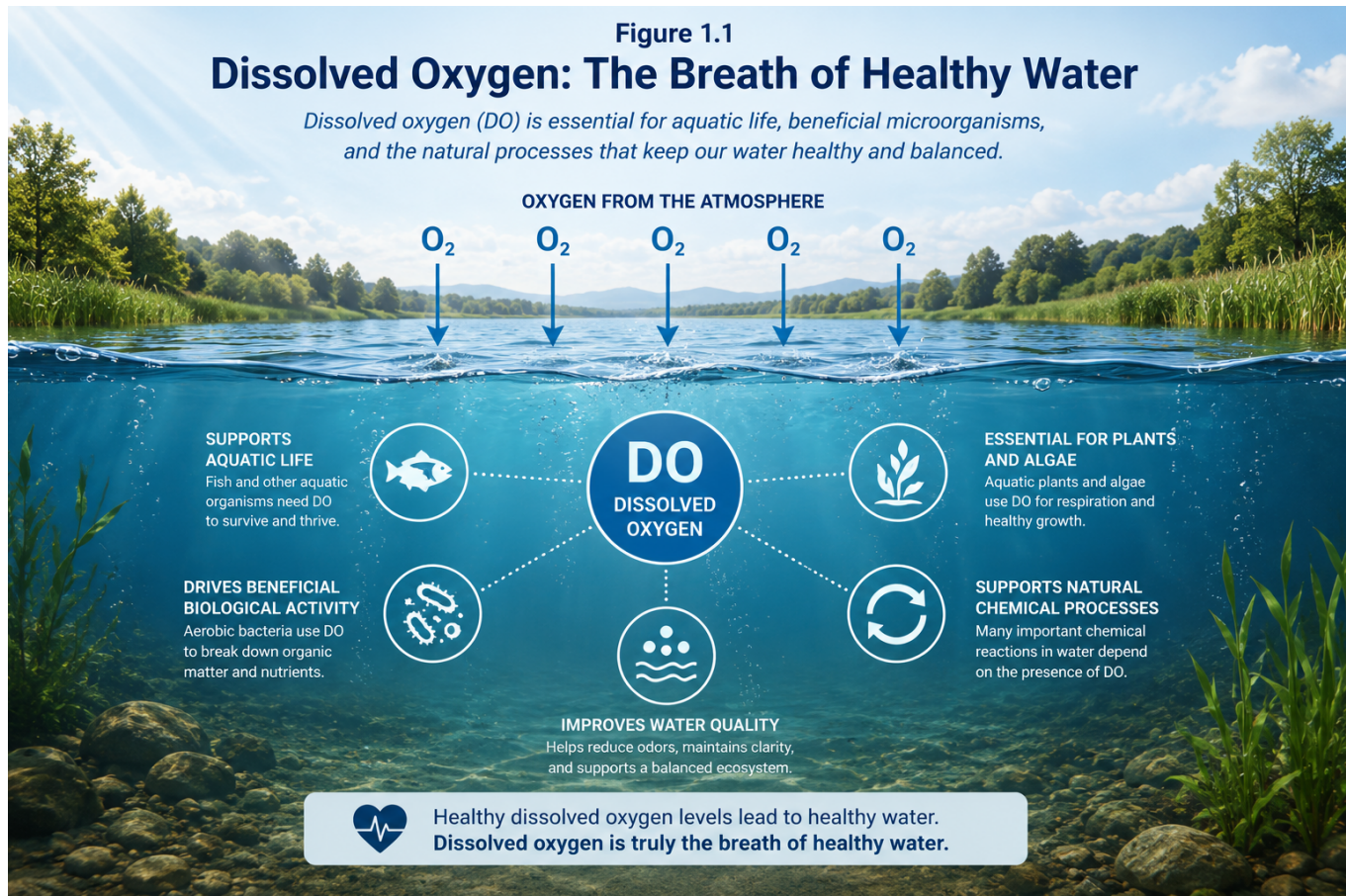
When measuring dissolved oxygen, avoid relying on a single reading. Measuring at different times of the day—particularly just before sunrise and again during the late afternoon—provides a much better understanding of how dissolved oxygen changes over a normal daily cycle.

Pull Quote

"Dissolved oxygen cannot be seen, but its influence can be observed in every healthy aquatic ecosystem."

Key Takeaway

Dissolved oxygen is much more than simply oxygen dissolved in water. It is one of the most important indicators of water health, continuously responding to changes in temperature, biological activity, water movement, and environmental conditions. Understanding dissolved oxygen provides the foundation for understanding many other aspects of water quality.



Chapter 2

Why Dissolved Oxygen Matters

If water could breathe, dissolved oxygen would be its breath.

Although invisible, dissolved oxygen supports many of the biological and chemical processes that keep water healthy. Fish, beneficial bacteria, aquatic insects, and countless microscopic organisms all depend on it to survive. Without adequate dissolved oxygen, even clear water can become stressed and unhealthy.

Healthy dissolved oxygen levels are essential for more than aquatic life. They also help beneficial bacteria break down organic matter, reduce unpleasant odours, support natural nutrient cycling, and improve overall water quality. When oxygen levels decline, these natural processes slow, allowing water quality problems to develop more quickly.

Dissolved oxygen also provides valuable insight into the condition of a water body. Low oxygen levels may indicate excessive organic loading, poor circulation, thermal stratification, high biological demand, or other underlying problems. Rather than treating dissolved oxygen as the problem itself, it is often more useful to view it as an early warning indicator that something within the water system has changed.

Whether managing a wastewater treatment plant, an aquaculture pond, an irrigation reservoir, or a natural lake, maintaining appropriate dissolved oxygen levels is one of the most effective ways to support healthy, balanced water.

Founder's Notebook

One of the biggest mistakes I see is people trying to increase dissolved oxygen without first understanding **why** it is low.

Low dissolved oxygen is often a symptom rather than the root cause. Improving circulation, reducing organic loading, or addressing excessive algae growth may provide a more effective long-term solution than simply adding more oxygen.

Puroxi Insight

Healthy dissolved oxygen levels don't just support life—they help maintain the natural biological balance that keeps water functioning as a healthy ecosystem.

Did You Know?

Many fish species begin to experience stress when dissolved oxygen levels remain below approximately **5 mg/L**, although oxygen requirements vary considerably between species, water temperature, and life stage.

Practical Tip

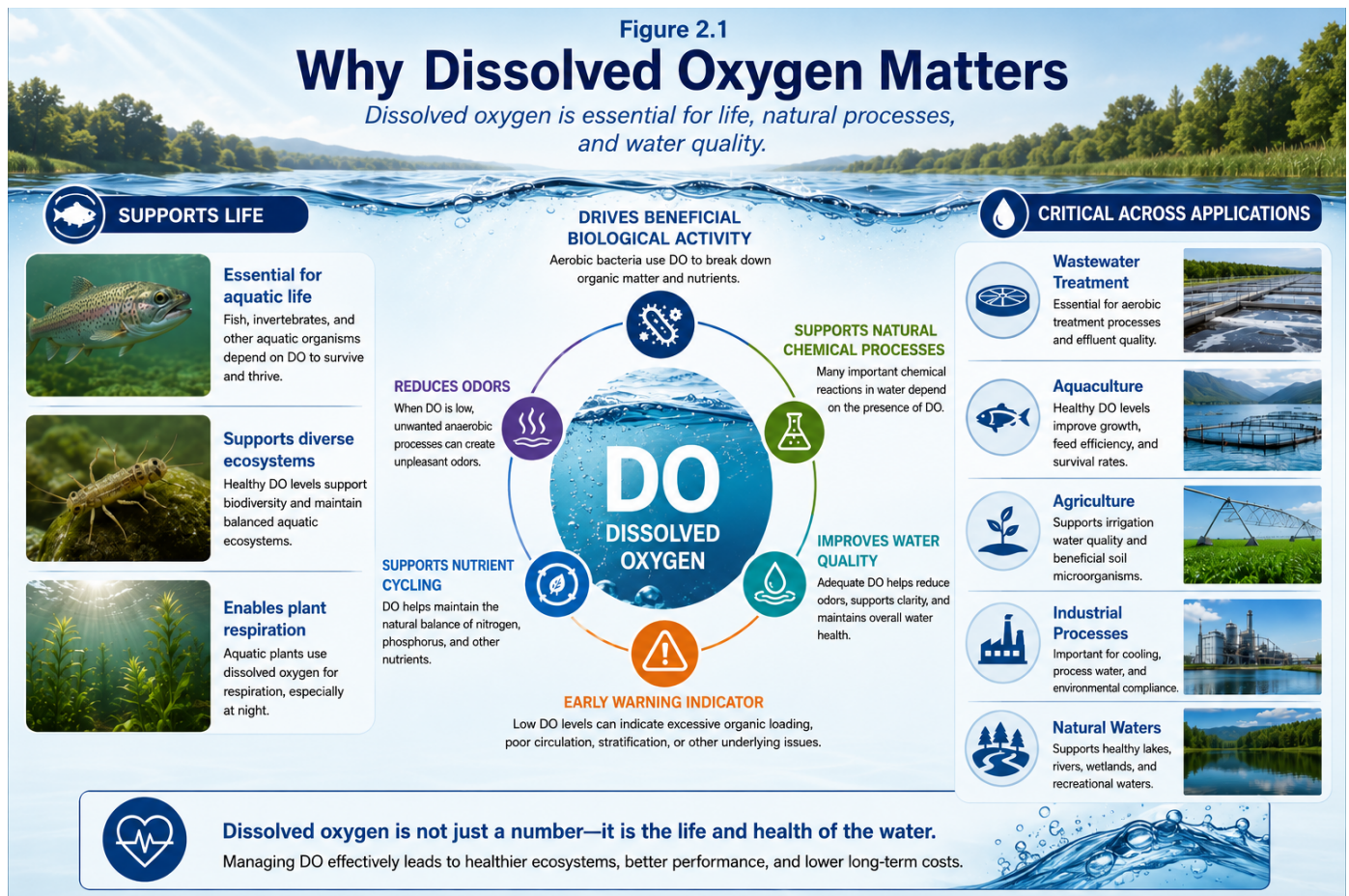
Don't wait until fish are gasping at the surface or unpleasant odours develop. Regular dissolved oxygen monitoring can identify changing water conditions long before visible problems appear.

Pull Quote

"Dissolved oxygen doesn't just support life—it reveals the health of the entire water system."

Key Takeaway

Dissolved oxygen is much more than a measurement. It is one of the clearest indicators of water health and often provides the first warning that conditions within a water system are beginning to change.



Chapter 3

Where Does Dissolved Oxygen Come From?

Dissolved oxygen doesn't simply appear in water. It is continuously added and removed through natural physical, chemical, and biological processes. Understanding these sources helps explain why oxygen levels change throughout the day and across different seasons.

The primary source of dissolved oxygen is the **atmosphere**. As air comes into contact with the water surface, oxygen molecules naturally diffuse into the water until an equilibrium is reached. Wind, waves, rainfall, waterfalls, and flowing streams increase this exchange by constantly exposing fresh water to the air.

Aquatic plants and algae also contribute dissolved oxygen through **photosynthesis**. During daylight hours, they use sunlight to convert carbon dioxide and water into energy, releasing oxygen into the surrounding water. This is why dissolved oxygen levels often increase during the day and decline after sunset when photosynthesis stops.

In many managed water systems, dissolved oxygen is increased using **mechanical aeration**, **pure oxygen injection**, or **nanobubble technology**. These methods are designed to improve oxygen transfer, particularly where natural oxygen replenishment cannot keep pace with biological demand.

The amount of oxygen entering the water is only part of the story. Dissolved oxygen levels depend on the balance between oxygen entering the water and oxygen being consumed. Understanding both sides of this balance is essential for maintaining healthy water quality.

Founder's Notebook

Many people assume that simply adding bubbles means more dissolved oxygen.

In reality, the **size of the bubble**, the **contact time**, the **depth of injection**, **water movement**, and the **oxygen demand within the water** all influence how much oxygen actually dissolves.

The goal is not to produce more bubbles.

The goal is to transfer more oxygen into the water.

Puroxi Insight

Healthy water is constantly exchanging oxygen with its surroundings. The more efficiently this exchange occurs, the more resilient the water becomes to changing environmental conditions.

Did You Know?

Most natural oxygen enters a lake or pond through the **surface of the water**, not from the bottom. Wind-driven mixing is one of nature's most effective methods of oxygen transfer.

Practical Tip

If dissolved oxygen levels remain consistently low, investigate **why oxygen demand exceeds oxygen supply** before selecting a treatment solution. Addressing the root cause often produces better long-term results than simply increasing aeration.

Pull Quote

"Healthy water depends on maintaining a balance between oxygen entering the water and oxygen being consumed."

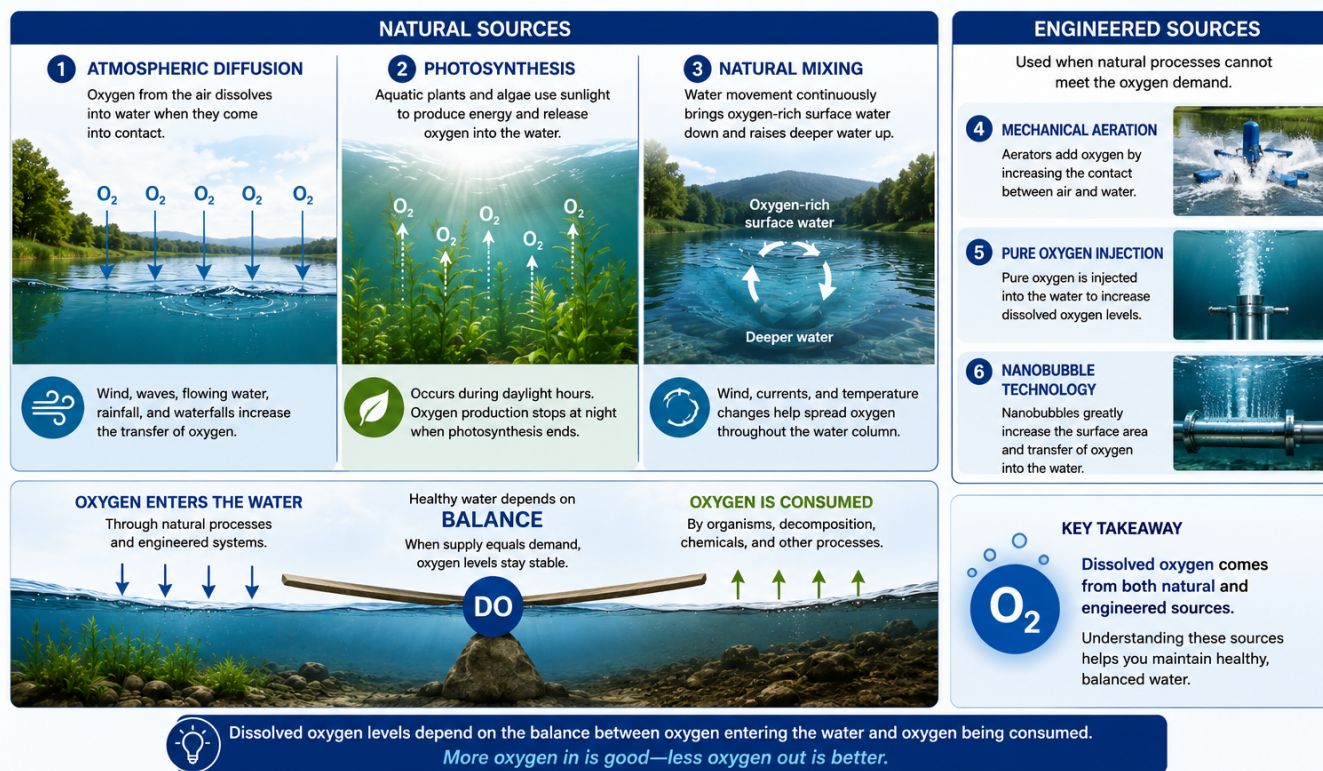
Key Takeaway

Dissolved oxygen enters water through natural processes such as atmospheric diffusion and photosynthesis, as well as engineered systems like aeration and nanobubble technology. Maintaining healthy oxygen levels depends on balancing oxygen supply with oxygen demand.

Figure 3.1

Where Dissolved Oxygen Comes From

Dissolved oxygen enters water through natural processes and engineered solutions.



Chapter 4

Where Does Dissolved Oxygen Go?

Just as dissolved oxygen is constantly entering the water, it is also being continuously consumed. Healthy water depends on maintaining a balance between oxygen entering the system and oxygen being used by natural biological and chemical processes.

One of the largest consumers of dissolved oxygen is **aquatic respiration**. Fish, shrimp, insects, and countless microscopic organisms require oxygen to survive. Just like humans breathe air, aquatic organisms extract dissolved oxygen from the water.

Beneficial bacteria also consume oxygen as they break down leaves, algae, manure, wastewater, and other organic materials. This natural process is essential for healthy water, but when excessive organic matter is present, oxygen demand can exceed oxygen supply.

Chemical reactions can also reduce dissolved oxygen. The oxidation of iron, manganese, sulfides, and other compounds consumes oxygen as these substances react naturally within the water.

During hot weather, oxygen depletion can occur more rapidly. Warmer water holds less dissolved oxygen while biological activity often increases, creating a situation where oxygen is consumed faster than it can be replaced.

Understanding what is consuming oxygen is often more important than simply measuring how much oxygen remains.

Founder's Notebook

When customers tell me their dissolved oxygen is low, my first question is rarely, **"How can we add more oxygen?"**

Instead, I ask,

"What is consuming the oxygen?"

Finding the answer usually leads to a better long-term solution.

Puroxi Insight

Every water body has an oxygen budget. Healthy systems replace oxygen at approximately the same rate it is consumed. Problems begin when oxygen demand consistently exceeds oxygen supply.

Did You Know?

Large algae blooms can actually reduce dissolved oxygen. While algae produce oxygen during daylight through photosynthesis, they consume oxygen at night through respiration. As algae die and decompose, bacteria consume even more oxygen, sometimes leading to fish kills.

Practical Tip

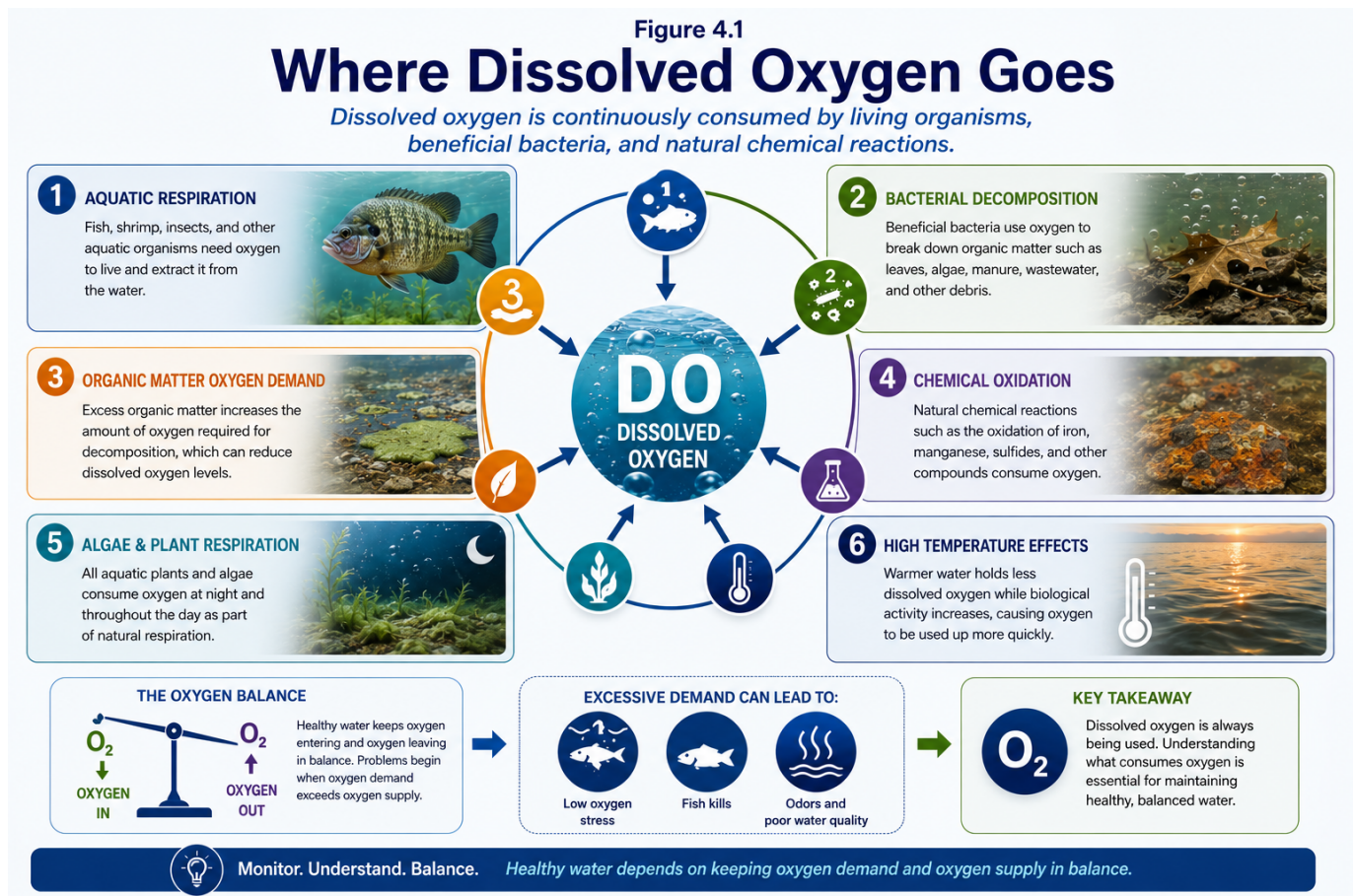
If dissolved oxygen suddenly declines, investigate recent changes such as increased organic loading, warmer temperatures, algae blooms, poor circulation, or equipment failures before deciding on corrective action.

Pull Quote

"Understanding what consumes oxygen is the first step toward restoring healthy water."

Key Takeaway

Dissolved oxygen is continuously consumed by living organisms, beneficial bacteria, and natural chemical reactions. Healthy water depends on maintaining a balance between oxygen consumption and oxygen replenishment.



Chapter 5

Temperature and Dissolved Oxygen

Temperature has one of the greatest influences on dissolved oxygen. As water warms, its ability to hold oxygen decreases. At the same time, fish, plants, and beneficial bacteria often become more active, increasing the demand for oxygen. This combination can quickly place stress on an aquatic system, particularly during the summer months.

Cold water naturally contains more dissolved oxygen than warm water. This is one of the reasons why trout thrive in cool mountain streams, while warm, stagnant ponds are more susceptible to low dissolved oxygen and water quality problems.

Temperature also affects how quickly biological and chemical reactions occur. Warmer conditions accelerate decomposition and microbial activity, causing oxygen to be consumed more rapidly. During periods of hot weather, oxygen may be used faster than it can be replaced, especially in ponds, reservoirs, wastewater lagoons, and other slow-moving water bodies.

Seasonal changes also influence dissolved oxygen. During the summer, lakes and reservoirs may develop layers of warm and cold water, a process known as **thermal stratification**. Because these layers mix less effectively, deeper water can gradually lose dissolved oxygen while the surface remains oxygen-rich.

Understanding the relationship between temperature and dissolved oxygen is essential for effective water management. Monitoring both parameters together provides a much clearer picture of water health than measuring either one alone.

Founder's Notebook

One of the most common questions I receive is why water quality problems seem to appear during the hottest part of the year.

The answer is usually simple.

Warm water holds less oxygen just when biological activity is increasing. Nature creates a situation where oxygen supply decreases while oxygen demand increases.

Puroxi Insight

Temperature doesn't just influence dissolved oxygen—it influences nearly every biological and chemical process occurring in water. This is why temperature should always be recorded alongside dissolved oxygen measurements.

Did You Know?

Water at **5°C** can naturally hold almost twice as much dissolved oxygen as water approaching **35°C**, making temperature one of the most important factors affecting oxygen availability.

Practical Tip

Whenever possible, measure **temperature and dissolved oxygen together**. The two measurements provide valuable context and help explain changes that might otherwise seem confusing.

Pull Quote

"As water warms, oxygen becomes less available precisely when living organisms need it most."

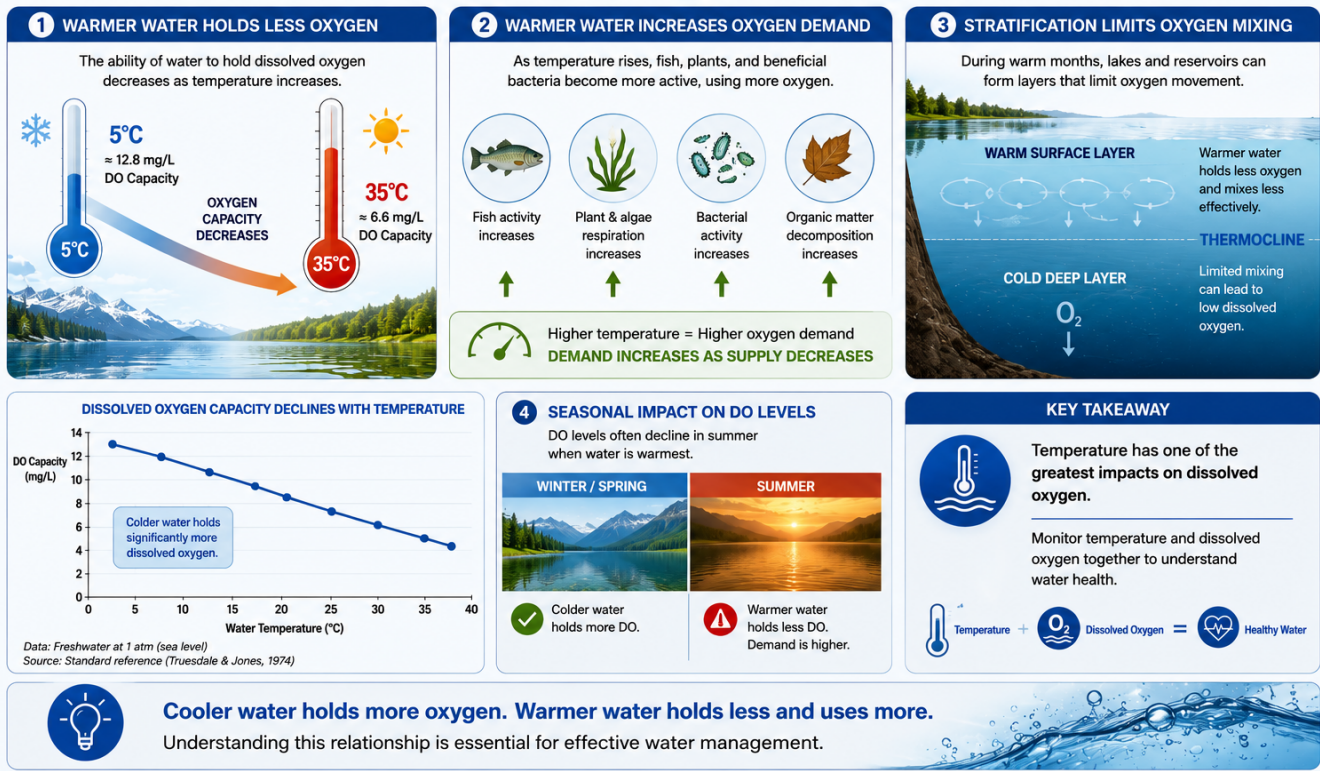
Key Takeaway

Temperature and dissolved oxygen are closely connected. Warm water holds less oxygen while increasing biological demand, making temperature one of the most important factors influencing overall water quality.

Figure 5.1

How Temperature Affects Dissolved Oxygen

As water warms, it holds less dissolved oxygen while biological demand increases.



Chapter 6

Dissolved Oxygen Across Different Industries

Dissolved oxygen is important wherever water supports life, biological activity, or treatment processes. Although the ideal oxygen level varies between applications, understanding dissolved oxygen helps operators make better decisions and maintain healthier water systems.

In **aquaculture**, dissolved oxygen is essential for the health, growth, and survival of fish, shrimp, and other aquatic species. Low oxygen levels can reduce feeding, increase stress, slow growth, and make animals more susceptible to disease.

In **wastewater treatment**, beneficial aerobic bacteria require dissolved oxygen to efficiently break down organic matter. Insufficient oxygen can reduce treatment efficiency, create odours, and negatively affect effluent quality.

For **lakes, ponds, and reservoirs**, healthy dissolved oxygen supports balanced ecosystems, improves water clarity, and helps reduce the likelihood of fish kills and nuisance conditions.

In **agriculture**, dissolved oxygen contributes to healthy irrigation water and supports beneficial microbial activity within irrigation reservoirs and water storage systems.

Many **industrial water systems**, including cooling water and process water applications, also benefit from monitoring dissolved oxygen. Oxygen influences biological activity, oxidation reactions, corrosion potential, and overall system performance.

Although every application is different, the principle remains the same: understanding dissolved oxygen helps maintain healthier water and supports better long-term management decisions.

Founder's Notebook

People often ask me what dissolved oxygen level they should aim for.

My answer is always the same.

The right dissolved oxygen level depends on what you're trying to achieve.

A trout stream, a wastewater aeration basin, and an irrigation reservoir all have different objectives, so they should never be managed using exactly the same dissolved oxygen target.

Puroxi Insight

There is no universal dissolved oxygen number that applies to every water system. Good water management is about understanding the application, not simply chasing a single measurement.

Did You Know?

Fish are often the first organisms to show signs of low dissolved oxygen, but beneficial bacteria and many other aquatic organisms are affected long before visible problems become apparent.

Practical Tip

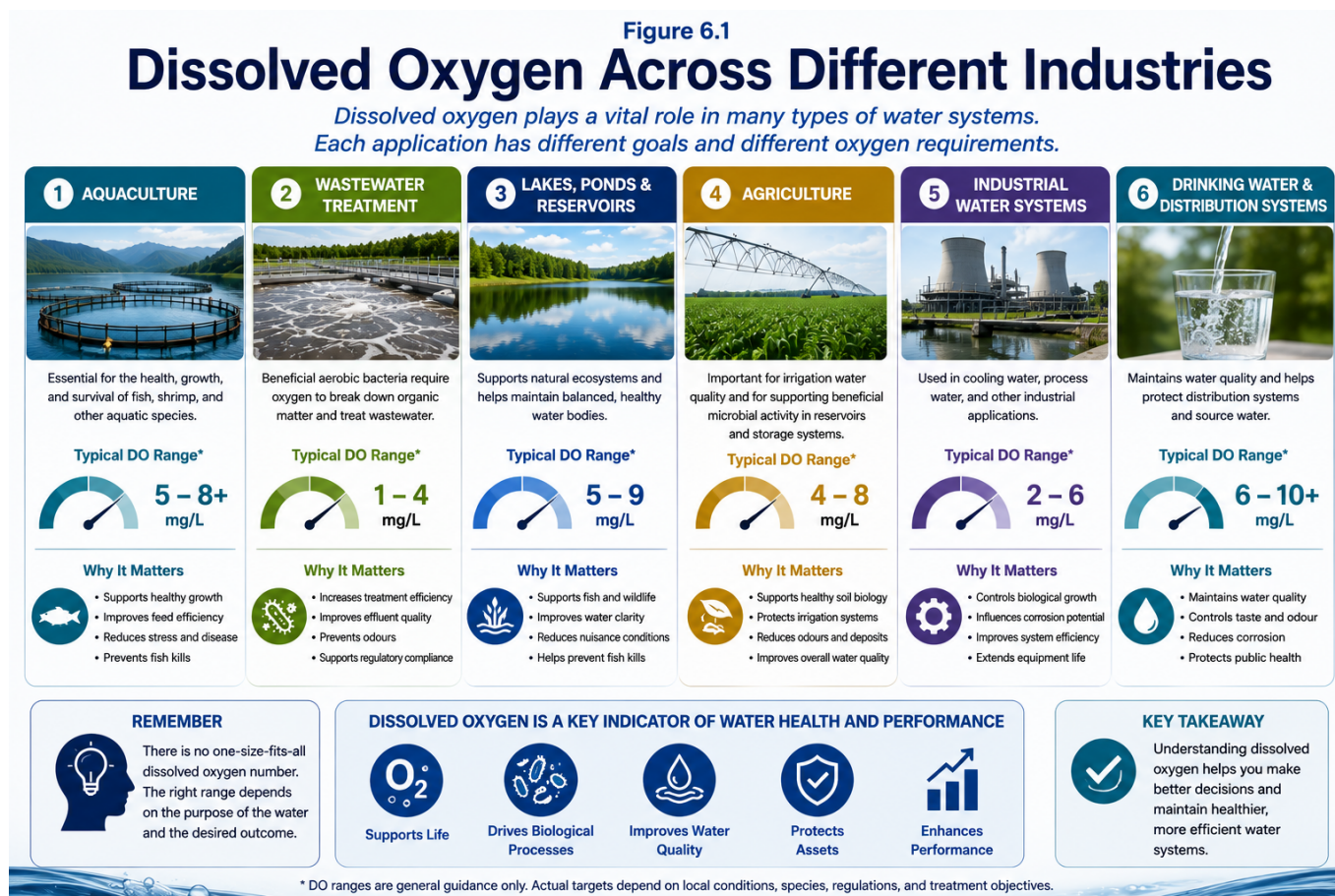
When evaluating dissolved oxygen, always consider the intended use of the water. The most appropriate dissolved oxygen range depends on the specific application and its operational objectives.

Pull Quote

"The best dissolved oxygen level is the one that supports the purpose of the water."

Key Takeaway

Dissolved oxygen is important across agriculture, aquaculture, municipal water, wastewater, industrial processes, and natural ecosystems. While oxygen requirements differ between applications, understanding dissolved oxygen is essential for effective water management.



Chapter 7

Measuring Dissolved Oxygen

Understanding dissolved oxygen begins with accurate measurement. Fortunately, modern dissolved oxygen meters make monitoring oxygen levels faster, easier, and more reliable than ever before.

Most dissolved oxygen measurements are taken using portable electronic meters equipped with either **optical (luminescent)** or **electrochemical** sensors. These instruments provide real-time measurements, allowing operators to quickly assess changing water conditions.

However, a single dissolved oxygen reading only tells part of the story.

Because dissolved oxygen changes throughout the day, measurements should always be considered alongside other important water quality parameters such as **temperature**, **pH**, and, where appropriate, **oxidation-reduction potential (ORP)**. Together, these measurements provide a much clearer understanding of overall water health.

Location is also important. Oxygen levels near the surface may differ significantly from those near the bottom, particularly in deeper lakes, reservoirs, and lagoons where thermal stratification can occur. Measuring at different depths often reveals valuable information about water circulation and biological activity.

Perhaps the most important principle is consistency. Taking measurements at the same locations and approximately the same time each day makes it much easier to identify trends and detect changes before they become significant problems.

Founder's Notebook

One dissolved oxygen measurement is a snapshot.

A series of dissolved oxygen measurements becomes a story.

The more consistently you monitor your water, the better you understand what it is trying to tell you.

Puroxi Insight

Trend analysis is often far more valuable than a single measurement. Small changes over time frequently provide the earliest indication that water conditions are changing.

Did You Know?

Many water professionals record **temperature, dissolved oxygen, and pH together** because these three measurements provide valuable insight into the physical, chemical, and biological condition of a water body.

Practical Tip

Whenever possible, measure dissolved oxygen at the same locations and at approximately the same time of day. Consistent monitoring makes it much easier to recognize meaningful changes.

Pull Quote

"A single measurement tells you where your water is today. Consistent monitoring tells you where it is going."

Key Takeaway

Accurate dissolved oxygen measurements are important, but understanding trends over time is even more valuable. Regular monitoring provides the information needed to recognize changing conditions and make better water management decisions.

Figure 7.1

Measuring Dissolved Oxygen

Accurate measurement and consistent monitoring are essential for understanding and managing water quality.



Chapter 8

Common Myths About Dissolved Oxygen

Like many aspects of water science, dissolved oxygen is often misunderstood. Separating fact from myth helps us make better decisions and avoid solving the wrong problem.

Myth 1: More dissolved oxygen is always better.

Reality: Healthy dissolved oxygen levels are important, but more is not always necessary. The appropriate dissolved oxygen level depends on the application, water temperature, species present, and operational objectives.

Myth 2: Clear water always has high dissolved oxygen.

Reality: Water can appear crystal clear while containing very little dissolved oxygen. Likewise, healthy water with good oxygen levels may naturally contain suspended particles or algae.

Myth 3: Adding more bubbles always means more dissolved oxygen.

Reality: Bubble size, contact time, oxygen concentration, and mixing all influence oxygen transfer efficiency. Simply producing more bubbles does not guarantee more oxygen will dissolve into the water.

Myth 4: Dissolved oxygen only matters in aquaculture.

Reality: Dissolved oxygen plays an important role in wastewater treatment, lakes, reservoirs, agriculture, industrial water systems, and many other applications where biological and chemical processes occur.

Founder's Notebook

One of the most valuable lessons I've learned is that water rarely has a single problem.

Low dissolved oxygen is often a symptom of something else happening within the water system. Understanding the cause almost always leads to a better solution than treating the symptom alone.

Puroxi Insight

Understanding why dissolved oxygen changes is far more valuable than memorizing a target number.

Did You Know?

Dissolved oxygen naturally rises and falls throughout the day, especially in ponds and lakes with aquatic plants and algae. A single measurement may not represent typical daily conditions.

Practical Tip

When dissolved oxygen changes unexpectedly, investigate the reason before deciding on corrective action. Understanding the cause often prevents unnecessary treatment.

Pull Quote

"Good water management begins by questioning assumptions, not accepting myths."

Key Takeaway

Understanding the science behind dissolved oxygen helps separate fact from fiction. Better understanding leads to better decisions and healthier water systems.

Figure 8.1

Common Myths About Dissolved Oxygen

Separating fact from myth helps us make better decisions and maintain healthier water systems.

1 MYTH: More dissolved oxygen is always better.  REALITY: Healthy dissolved oxygen levels are important, but more is not always necessary. The appropriate DO level depends on the application, water temperature, species present, and operational objectives.  Focus on the right DO level for the right purpose.	2 MYTH: Clear water always has high dissolved oxygen.  REALITY: Water can appear crystal clear while containing very little dissolved oxygen. Likewise, healthy water with good oxygen levels may naturally contain suspended particles or algae.  Don't judge oxygen levels by how clear the water looks.	3 MYTH: Adding more bubbles always means more dissolved oxygen.  REALITY: Bubble size, contact time, oxygen concentration, and mixing all influence oxygen transfer efficiency. Simply producing more bubbles does not guarantee more oxygen will dissolve into the water.  It's about efficient transfer, not just more bubbles.	4 MYTH: Dissolved oxygen only matters in aquaculture.  REALITY: Dissolved oxygen plays an important role in many applications where biological and chemical processes occur.  DO is essential across many industries and environments.	
FOUNDER'S NOTEBOOK  Water rarely has a single problem. Low dissolved oxygen is often a symptom of something else happening within the water system. Understand the cause to find the best solution.	PUROXI INSIGHT  Understanding why dissolved oxygen changes is far more valuable than memorizing a target number.	DID YOU KNOW?  Dissolved oxygen naturally rises and falls throughout the day, especially in ponds and lakes with aquatic plants and algae.	PRACTICAL TIP  When dissolved oxygen changes unexpectedly, investigate the reason before deciding on corrective action. Understanding the cause often prevents unnecessary treatment.	PULL QUOTE  "Good water management begins by questioning assumptions, not accepting myths."
KEY TAKEAWAY: <i>Understanding the science behind dissolved oxygen helps separate fact from fiction. Better understanding leads to better decisions and healthier water systems.</i>				

Chapter 9

Improving Dissolved Oxygen

Maintaining healthy dissolved oxygen levels begins with understanding why oxygen is low in the first place. While adding oxygen may be part of the solution, addressing the underlying cause often provides better long-term results.

Improving water circulation is one of the simplest and most effective ways to support dissolved oxygen. Moving water allows oxygen-rich surface water to mix with deeper water, reducing stagnation and improving overall water quality.

Reducing excessive organic matter also helps maintain oxygen levels. Leaves, algae, manure, wastewater, and other organic materials consume oxygen as they decompose. Managing these sources reduces oxygen demand and helps restore balance.

When natural oxygen transfer is insufficient, engineered solutions may be appropriate. Mechanical aeration, pure oxygen systems, and nanobubble technology can all increase dissolved oxygen when properly designed for the application. The most effective solution depends on the water body, treatment objectives, and operating conditions.

No single method is suitable for every application. The best approach is always based on understanding the water, identifying the cause of oxygen depletion, and selecting the most appropriate management strategy.

Founder's Notebook

People often ask which technology is best for increasing dissolved oxygen.

My answer is always the same.

The best technology is the one that solves the actual problem—not just the symptom.

Every water body is different, which is why understanding your water should always come before selecting a treatment solution.

Puroxi Insight

Healthy water is rarely achieved through one action alone. Good circulation, reduced oxygen demand, and efficient oxygen transfer often work together to produce the best long-term results.

Did You Know?

Increasing dissolved oxygen does not always require adding more oxygen. In many cases, improving circulation or reducing oxygen demand can significantly improve dissolved oxygen levels.

Practical Tip

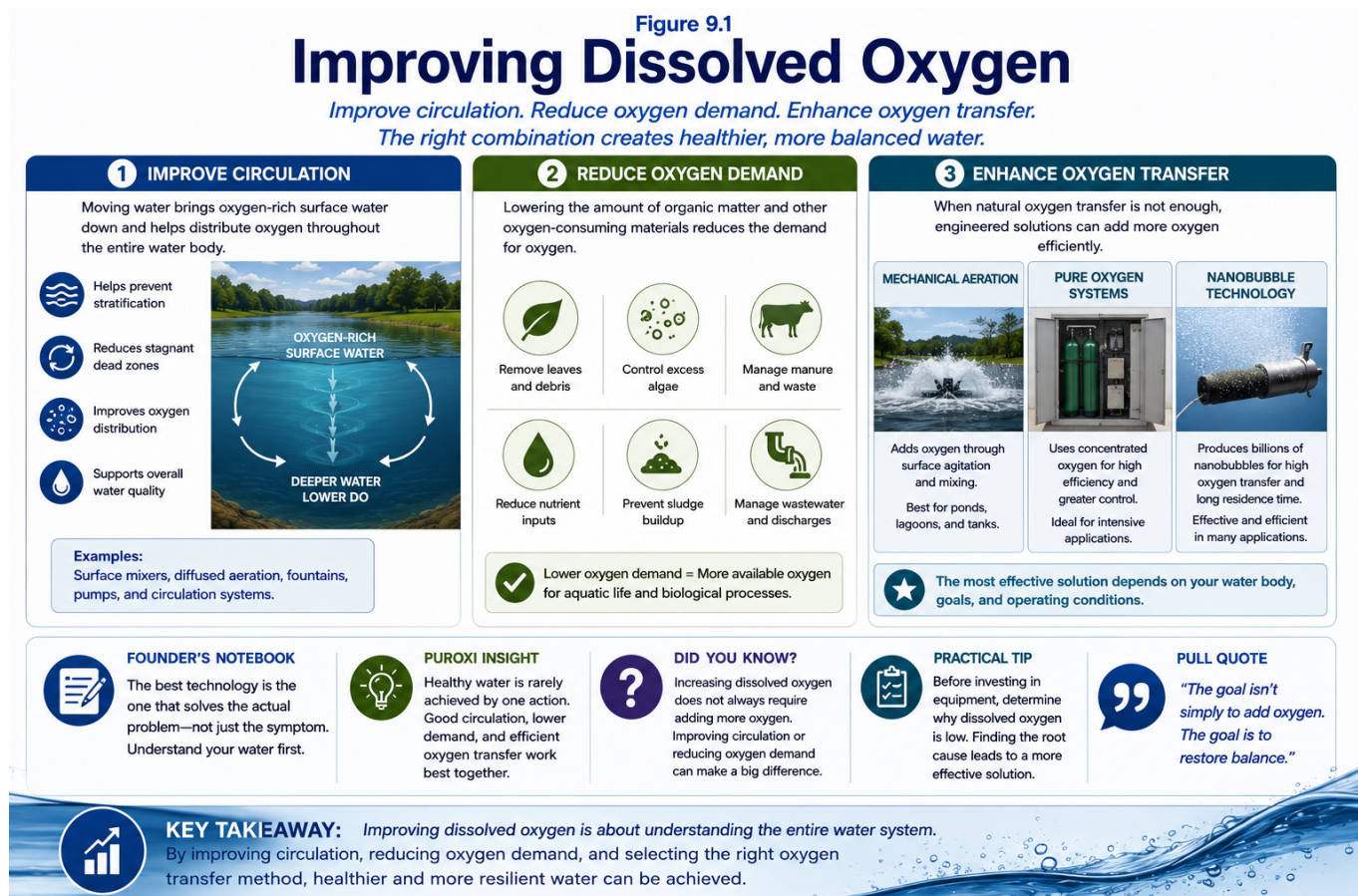
Before investing in equipment, determine **why** dissolved oxygen is low. Identifying the root cause often leads to a more effective and economical solution.

Pull Quote

"The goal isn't simply to add oxygen. The goal is to restore balance."

Key Takeaway

Improving dissolved oxygen is about understanding the entire water system. By improving circulation, reducing oxygen demand, and selecting the right oxygen transfer method, healthier and more resilient water can be achieved.



Chapter 10

What Is Your Water Trying to Tell You?

Throughout this publication, we've explored what dissolved oxygen is, why it matters, where it comes from, what consumes it, and how it influences healthy water systems.

The most important lesson is simple:

Dissolved oxygen is more than a measurement—it is a messenger.

Changes in dissolved oxygen often indicate that something within the water has changed. Rising temperatures, increased biological activity, poor circulation, or excessive organic matter can all influence oxygen levels. Rather than simply reacting to a number, ask what the water is trying to tell you.

Every water body is different, and there is no single solution for every situation. Understanding how dissolved oxygen behaves helps us make better decisions and maintain healthier water.

At Puroxi, we believe that education is the foundation of good water management.

Understanding Always Comes Before Recommendation.

Founder's Notebook

Water is always communicating.

The challenge isn't collecting the information.

The challenge is learning how to interpret it.

Puroxi Insight

Dissolved oxygen is one of the clearest indicators of water health and one of the first to reveal that conditions are changing.

Practical Tip

Monitor dissolved oxygen regularly and consider it alongside temperature and pH to build a more complete understanding of your water.

Pull Quote

"Water is always communicating. Learn to understand its language."

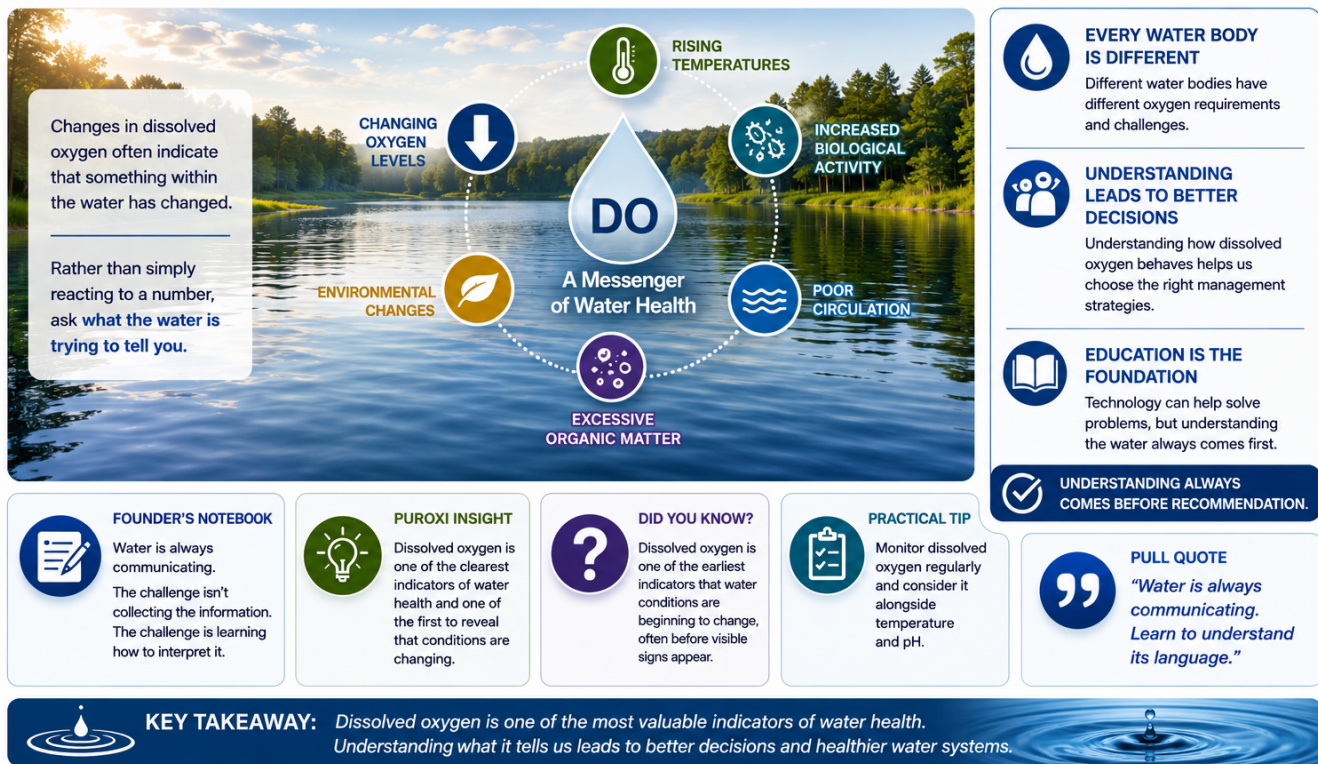
Key Takeaway

Dissolved oxygen is one of the most valuable indicators of water health. Understanding what it tells us leads to better decisions and healthier water systems.

Figure 10.1

What Is Your Water Trying to Tell You?

Dissolved oxygen is more than a measurement— it is a messenger.



Continue the Conversation

Water is one of our planet's most valuable resources, and understanding it is the first step toward managing it responsibly.

We hope this publication has provided practical insight into the role dissolved oxygen plays in healthy water systems and has encouraged you to look beyond individual measurements to better understand the water around you.

If you have questions about this publication, would like to discuss a specific application, or have suggestions for future topics in the **Puroxi Water Series**, we would be pleased to hear from you.

Contact Puroxi

Puroxi Pure Water Global Inc.

British Columbia, Canada

 www.puroxi.com

 info@puroxi.com

Together, let's continue learning about water—one publication at a time.

About Puroxi

Puroxi Pure Water Global Inc. is a Canadian water technology company dedicated to improving water quality through education, innovation, and practical treatment solutions.

Our mission extends beyond providing products. We believe that understanding water is the foundation of effective water management. Through the **Puroxi Water Series**, **Puroxi Knowledge Centre**, and our technical publications, we aim to make water science accessible to municipalities, industry, agriculture, aquaculture, consultants, educators, and students around the world.

Our areas of focus include:

- Nanobubble Technology
- Oxygen Generation
- Ultrasonic Algae Control
- Water Quality Monitoring
- Environmental Water Management
- Drinking Water
- Wastewater Treatment
- Industrial Water Systems
- Agriculture & Aquaculture

At Puroxi, we believe that informed decisions lead to better water management, healthier ecosystems, and more sustainable communities.

Understanding Always Comes Before Recommendation.

Publication Information

Publication Title

Understanding Dissolved Oxygen – The Breath of Healthy Water

Publication Number

PWS-004

Series

Puroxi Water Series

Publisher

Puroxi Pure Water Global Inc.

British Columbia, Canada

www.puroxi.com

Copyright

© 2026 Puroxi Pure Water Global Inc.

All rights reserved.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means without prior written permission from the publisher, except for brief quotations used for educational or review purposes.

This publication is intended as an educational resource. While every effort has been made to ensure the accuracy of the information presented, Puroxi Pure Water Global Inc. accepts no responsibility for errors, omissions, or decisions made based on the information contained within this publication. Water quality conditions vary between applications, and professional advice should be obtained where appropriate.

Suggested Citation

Puroxi Pure Water Global Inc. (2026).

Understanding Dissolved Oxygen – The Breath of Healthy Water.

Puroxi Water Series, PWS-004.

