


CUTTING EDGE PEER-REVIEWED SCIENCE RESEARCH ADAPTED FOR STUDENTS AND THEIR TEACHERS



An easy way to introduce students to scientific research concepts: Science Journal for Kids

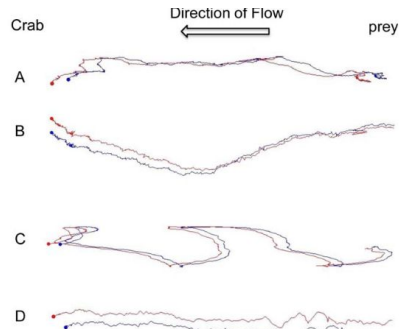
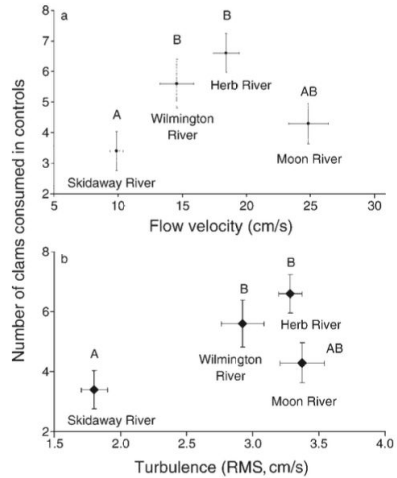
Dr. Miranda Wilson
Senior Content Managing Editor

Issues with scientific research - A student perspective

and used to compute net velocity (U) for each burst. An index of turbulence intensity (TI) allowed comparison of mixing conditions across a range of velocities and was calculated as:

$$TI = \frac{\sqrt{(u_{rms})^2 + (v_{rms})^2 + (w_{rms})^2}}{\sqrt{u^2 + v^2 + w^2}} \quad (1)$$

where u_{rms} , v_{rms} and w_{rms} are root mean square velocity for each burst (e.g. Jonsson et al. 2006). Because city fluctuations associated with waves could com-



Vol. 374, 13–22, 2009
doi:10.1002/ecpp.774

MARINE ECOLOGY PROGRESS SERIES
Mar Ecol Prog Ser

Published January 13

Habitat complexity alters lethal and non-lethal olfactory interactions between predators and prey

thwe C. Ferrel^{1*}, Delbert L. Smee², Marc J. Weissburg³

Hydrodynamic sensory stressors produce nonlinear predation patterns

DELBERT L. SMEE,^{1*} MATTHEW C. FERREL,² AND MARC J. WEISSBURG³



Image Credits: Pexels.com
Andrea Piacqua
Monstera Productions
Anna Shvets



One solution - a gentle introduction

- Adapted literature
 - Correct reading level
 - Understandable vocabulary
- Real and recent research
- Interesting topics
- Easy for teachers
- Improved understanding of scientific method

IMPACT ASSESSMENT STUDY

Executive Summary

By Alana Siegner and Tanya Dimitrova,
Energy and Resources Group, University of California Berkeley

IDEA BANK

TIPS AND TECHNIQUES FOR CREATIVE TEACHING

Using Adapted Primary Literature in the Science Classroom

MIRANDA WILSON AND TANYA DIMITROVA

The ScienceTeacher

SEPTEMBER/OCTOBER 2022

Results:

We measured a 40% improvement in the sections where teachers used SJK's resources. The results were statistically significant to above 99% confidence interval. (I.e. if there were no difference between control and intervention groups, there would be a less than 1% chance of observing the results we found.)

	Averaged score (out of 4 possible points)
"Intervention" sections	2.47
"Control" sections	1.77

SJK - Our main resource

- Adapted peer-reviewed primary scientific research papers
 - Elementary, middle, and high school
 - Arranged like a scientific research paper
- Papers are:
 - Recently published
 - Suggested by student volunteers
 - Generally from high impact journals
- Adaptations are approved by researchers
 - Accurate representation of research



MARCH 2024

How can we make sure to catch only the fish we want to eat?

Authors:
Jesse F. Senko, S. Hoyt Peckham, Daniel Aguilar-Ramirez, and John H. Wang
Associate Editors:
Lois Flounders and Rachel Watson

Abstract

How much do you think seafood is worth? Would it surprise you to know that the world's seafood market was worth over \$250 *billion* in 2021?! And it's not just money. 3 billion people (over 1/3 of the world's population) rely on seafood as their main source of protein.

But the way that we fish is harming marine life. Bycatch, where animals like sharks and turtles are accidentally caught, is a big problem. We urgently need to find

solutions!

We wanted to find out whether we could use lights to make gillnet fishing better. Could using illuminated nets reduce the amount of bycatch?

We found that illuminated gillnets reduced the amount of bycatch. Even better, fishers using the nets still caught lots of the fish that they were targeting and spent less time retrieving the nets. It's a win-win!

Introduction

What do you imagine when you think of a fishing boat? Perhaps you picture a small rowboat with a few fishing rods. But this isn't what most fishing looks like across the world. There are loads of different boats and ways to catch fish! The biggest fishing boat in the world is 144 meters (472

feet) long and uses nets that can be bigger than football fields! Fishing like this is called **commercial fishing**. It's big business, employing 60 million people globally.

The most popular type of fishing gear in the world is called a **gillnet** (Fig. 1). It's important for coastal communities

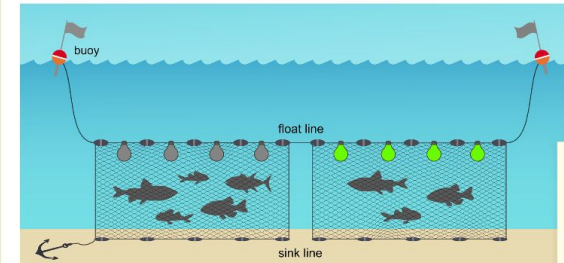
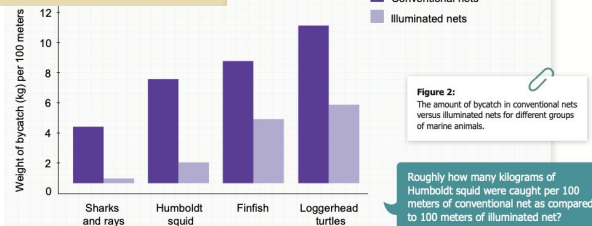
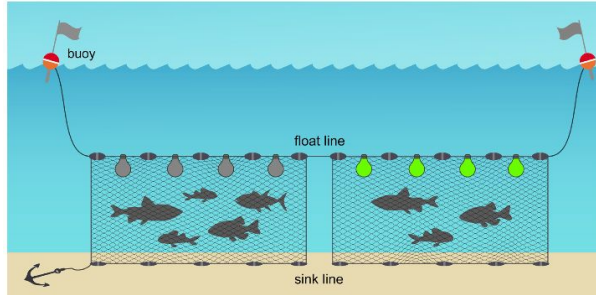


Figure 1: A gillnet is a wall of netting that traps fish and other marine animals. A bottom-set gillnet hangs from a float line of buoys and is anchored to the seafloor. We used paired sets of these nets with lights on them, one illuminated and one with the lights off.

Adaptations also have:

- Adapted methods and results figures
- Glossary of key terms
- Check Your Understanding questions
- Additional reference suggestions



Glossary of Key Terms

Bycatch – marine animals that are caught accidentally in fishing nets. This includes dolphins, sea turtles, sharks, rays, and seabirds. Often these species are already threatened or endangered, with fishing usually being the biggest threat they face.

Commercial fishing – catching fish for profit. This can be small scale (like gillnet fishing) or large scale.

Fishers – traditionally people that work in fishing have been called fishermen. But it's not always men that fish! So, "fishers" is now the best way to talk about people who work in fishing.

Gillnet – a wall of netting that hangs in the water. The net is usually made of nylon. It's designed so that the fish get their gills stuck in the net and cannot escape. Gillnets usually target fish like salmon, halibut, grouper, cod, haddock, herring, and seabass.

Selective – limiting how much is taken or chosen. In fishing, it describes how much bycatch a type of fishing tends to have. Gillnets are not selective because they have high bycatch. Pole-and-line fishing is more selective because they usually catch only target fish.

Sustainable – able to be maintained long-term. Generally, the more selective a type of fishing is, the more sustainable it is. At the moment, most fishing is not sustainable – we are catching too many target fish, as well as bycatch.

Target species, target catch – the type of fish that the fishers are trying to catch so they can sell it (for example, at a fish market).

Check your understanding

- 1 Why is telling people to stop eating fish not a solution? What about telling fishers to stop using gillnets?
- 2 How did we design our experiment to make sure that it was controlled?
- 3 How many target fish and bycatch species were caught in total during our experiment?
- 4 Why is reducing bycatch a win not just for marine life but also for fishers?
- 5 What are the most sustainable species of fish to eat in your country?

REFERENCES

Jesse F. Senko, S. Hoyt Peckham, Daniel Aguilar-Ramirez, and John H. Wang (2022) *Net illumination reduces fisheries bycatch, maintains catch value, and increases operational efficiency*. Current Biology.

<https://www.sciencedirect.com/science/article/abs/pii/S0960982221017371>

Marine Stewardship Council: Fishing methods and gear types

<https://www.msc.org/en-us/what-we-are-doing/our-approach/fishing-methods-gear-types>

National Oceanic and Atmospheric Administration: Fisheries and seafood

<https://www.noaa.gov/education/resource-collections/marine-life/fisheries-and-seafood>

Example

Fisheries Adaptation

SJK - Additional Resources

- Audio versions of articles (video and podcast forms available)
- Blackboard versions of articles (SJK Academy)
- Videos to introduce paper topics
- Additional activity/lab suggestions
 - Created by SJK educators
 - Curated from reputable educational partners



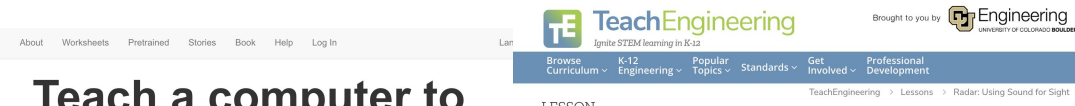
Teaching Activity: Analyzing and Interpreting Data

Based on:

How can we make sure to catch only the fish we want to eat?

Introduction:

Fishing provides nourishment for a large number of people around the world and fisheries can get depleted if we don't take care of them. This article and this activity explore data investigating more sustainable fishing techniques to make sure that we don't run out of fish to eat!



Teach a computer to play a game

Get started

Learn more

1

Collect examples of things you want to be able to recognise

TE TeachEngineering
Ignite STEM learning in K-12

Brought to you by Engineering
UNIVERSITY OF COLORADO BOULDER

Browse Curriculum K-12 Engineering Popular Topics Standards Get involved Professional Development

TeachEngineering > Lessons > Radar: Using Sound for Sight

LESSON

Radar: Using Sound for Sight

Quick Look



Waves

GRADE LEVEL: 6 (4 - 6)

LESSONS IN THIS UNIT: 12

TIME REQUIRED: 1 hour

More additional resources

- Lesson idea videos
- Ask a Scientist videos (questions from students)
- Podcasts
 - Lesson ideas - geared toward middle school
 - Ask-a-Scientist (long form interviews with researchers)
- Translations of adaptations (19 languages)
- Collections

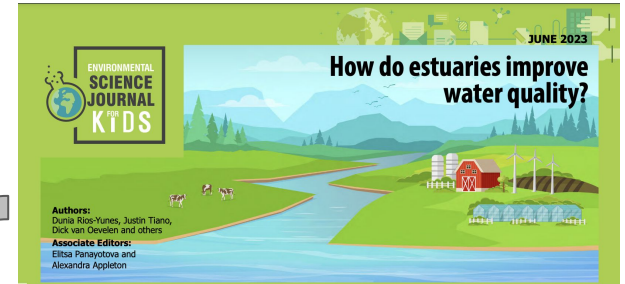


Website Tour

<https://www.sciencejournalforkids.org/>

Suggestions on how to use SJK resources

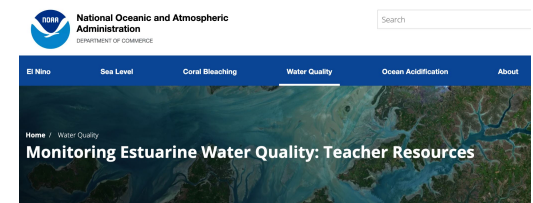
- Younger Students:
 - Pair adaptations with activities
 - In or outside the classroom
 - Create their own glossary to learn scientific vocab
 - Create their own results graph based on the text



- Older Students:
 - Pair adaptations with activities
 - Pair adaptations with original articles
 - Have students write their own adaptations
 - Have students replicate methodologies
 - Use both adaptations and original articles for reference



Pexels.com
Ben Libby



Interested in engaging your students with real-time NOAA data? In this module, designed for grades 6-8, students engage with an interactive graphing tool to explore parameters such as nutrients, temperature, salinity, pH, dissolved oxygen, and in some cases, contaminants. Students are guided through the use of these data to



Questions

My contact information:

Dr. Miranda Wilson - miranda@sciencejournalforkids.org