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from among three projects, including Euclid. Roger Bonnet, former ESA science chief and now director of the International Space Science Institute in Bern, says a single cooperative astronomy program between NASA and ESA might make sense. Blandford agrees: "We've got to examine all the options."

However, becoming a junior partner on an ESA mission is not an appealing prospect for U.S. astronomers. "The U.S. has had a strong history of leadership in the burgeoning fields of dark energy and exoplanet studies, and I think it would be a mistake to not continue to be leaders in those areas," says Adam Riess, an astrophysicist at Johns Hopkins University in Baltimore, Maryland.

The Casani report did find JWST to be on solid ground technically, giving astronomers hope that the telescope will eventually make it into space. Heidi Hammel, an astronomer at the Space Science Institute in Boulder, Colorado, notes that Hubble had similar overruns before its 1990 launch. "It proved the absolute workhorse for the broader community," she notes. "JWST is going to be that kind of tool, too." **–ANDREW LAWLER AND YUDHIJIT BHATTACHARJEE**

MARINE ECOLOGY

Key Indicator of Ocean Health May Be Flawed

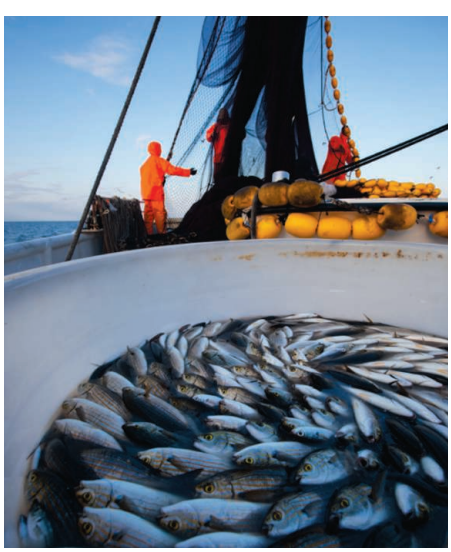
The most widely used metric of how marine ecosystems are faring worldwide can't be trusted, according to a controversial new analysis of fisheries data. If so, then policymakers could be left without a global picture of whether reforms to fisheries management are working. But not everyone agrees with the conclusion.

The metric is the mean trophic level (MTL) of fish being caught, an indicator based on rank in the food web, which is commonly thought to provide a rough measure of the diversity and integrity of ocean food webs. But in a paper in this week's issue of *Nature*, a team led by Trevor Branch of the University of Washington, Seattle, concludes that the underlying data—seafood reported caught—don't reveal ecosystem health in most cases. "This widely used metric doesn't measure what we think it's measuring," says Branch. The analysis also challenges an influential interpretation of decreasing MTL—and the way fishing affects marine ecosystems.

This interpretation made headlines in 1998, when Daniel Pauly, a marine biologist at the University of British Columbia, Vancouver, and his colleagues highlighted an alarming decrease in MTL of marine species since 1950. They took trophic levels of each species, calculated from what it eats, and then averaged these levels for all species caught worldwide. The team argued that fishing vessels had been sequentially depleting top predators like cod and tuna, then working their way down the food chain, a process that reduces biodiversity and can perturb an ecosystem. This phenomenon, dubbed "fishing down the food web," threw a spotlight on the impact of industrialized fisheries and led to grim predictions of "jellyfish and plankton stew."

The big advantage of catch data is their wide geographic coverage. Fisheries scientists, however, have long pointed out problems with reported catches. The data are murky because they reflect not only what's living in the ecosystem but also the type of fishing gear used and the economics of fishing, for example—factors that can complicate interpretations of the abundance and diversity of fish in the ecosystem.

Branch and his colleagues decided to conduct a comprehensive comparison of catch data with two other sources of data, trawl surveys and stock assessments, which are scientific estimates of abundance within ecosystems. Relying on a recent compilation of surveys and assessments, they calculated trends in global MTL from each. Because catch data yielded a different trend, Branch argues that they aren't a reliable gauge of the state of marine ecosystems worldwide.



What's the catch? Data collected from fishing vessels may not reveal ecosystem health.

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Branch's analysis also suggests that humans may not be fishing down the food web after all. In their analysis of catch data, Branch's group found that all trophic levels—from American oysters to bigeye tuna—are being caught in ever-increasing amounts. Although the catch data don't reveal how ecosystems are faring, Branch says they hint at a more optimistic future—one in which higher-level predators aren't wiped out, even if they and all other parts of the food web are scarcer than before.

Pauly says the Branch team's analysis is misleading. He argues that catch data, when pooled globally, must be corrected for the size of the area being fished, which increased dramatically from 1950 to the 1980s as fleets expanded into the high seas and the Southern Ocean. In addition, the trawl surveys and stock assessments are limited in scope and don't reveal what's going on worldwide. Pauly also points out that large, long-lived predators are particularly vulnerable to overfishing.

Branch maintains his conclusions are valid. He recommends that researchers focus not on MTL from catch data but on trends in abundance from trawl surveys and stock assessments. Joseph Powers of Louisiana State University, Baton Rouge, agrees, but he sees value in keeping an eye on MTL from catch data all the same. "Even with biases," he says, "it's still telling you that things are changing and maybe you need to investigate what's causing those changes." **–ERIK STOKSTAD**

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