

Reef data lab: lesson 3 of 4

A reef through a heatwave

What happened to our reefs
in the hot year of 2024?



Bleached coral



2024: a hot year for reefs

From early 2023 to mid-2025, bleaching-level heat stress reached 84% of the world's reef area, the biggest bleaching event on record.

Our coral dataset lets you see what that looked like on reefs in southern Negros Oriental.



Bleached coral



Your analysis, part 1

1. Filter the coral surveys to 2024.
2. For each month, work out the mean water temperature and the mean bleached_pct_of_coral.
3. Plot both on one chart: bars for bleaching, a line for temperature.
4. When did bleaching start, peak and end?

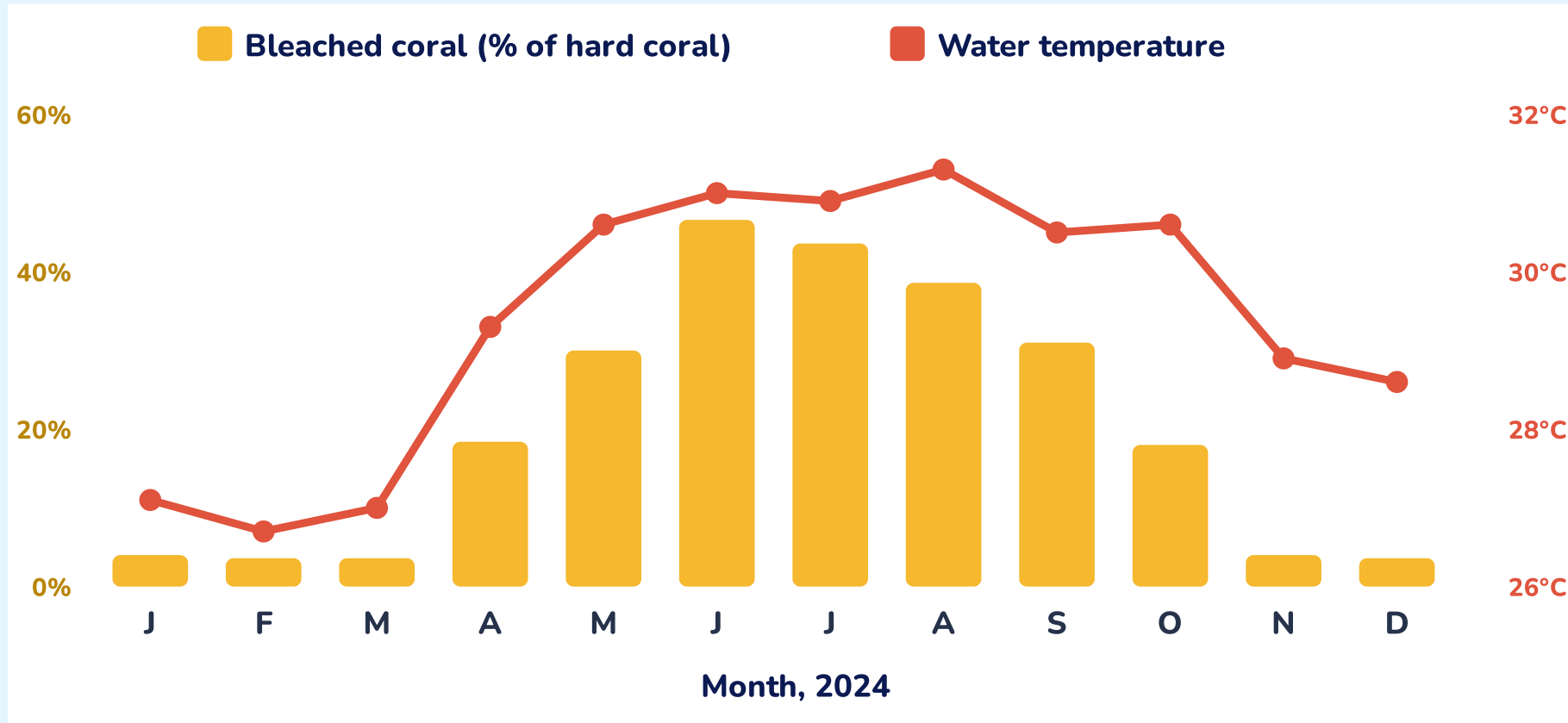
Formula help

=AVERAGEIFS(bleached column, year column, 2024, month column, 6)



What the data shows

Monthly averages for 2024, teaching dataset.



How we know: Teaching dataset based on MCP survey records, adjusted for learning



Which depth suffered most?

59.6%

of shallow coral bleached,
June to August 2024

40.7%

medium depth

24.5%

deep

Why might shallow corals bleach most? Think about light and heat.

How we know: Teaching dataset based on MCP survey records, adjusted for learning



Your analysis, part 2

1. Now use all the years.
2. Work out mean hard_coral_pct for each year, separately for protected and unprotected sites.
3. Plot two lines on one chart.
4. What happened to coral cover after the heatwave?
Did the two kinds of site recover differently?

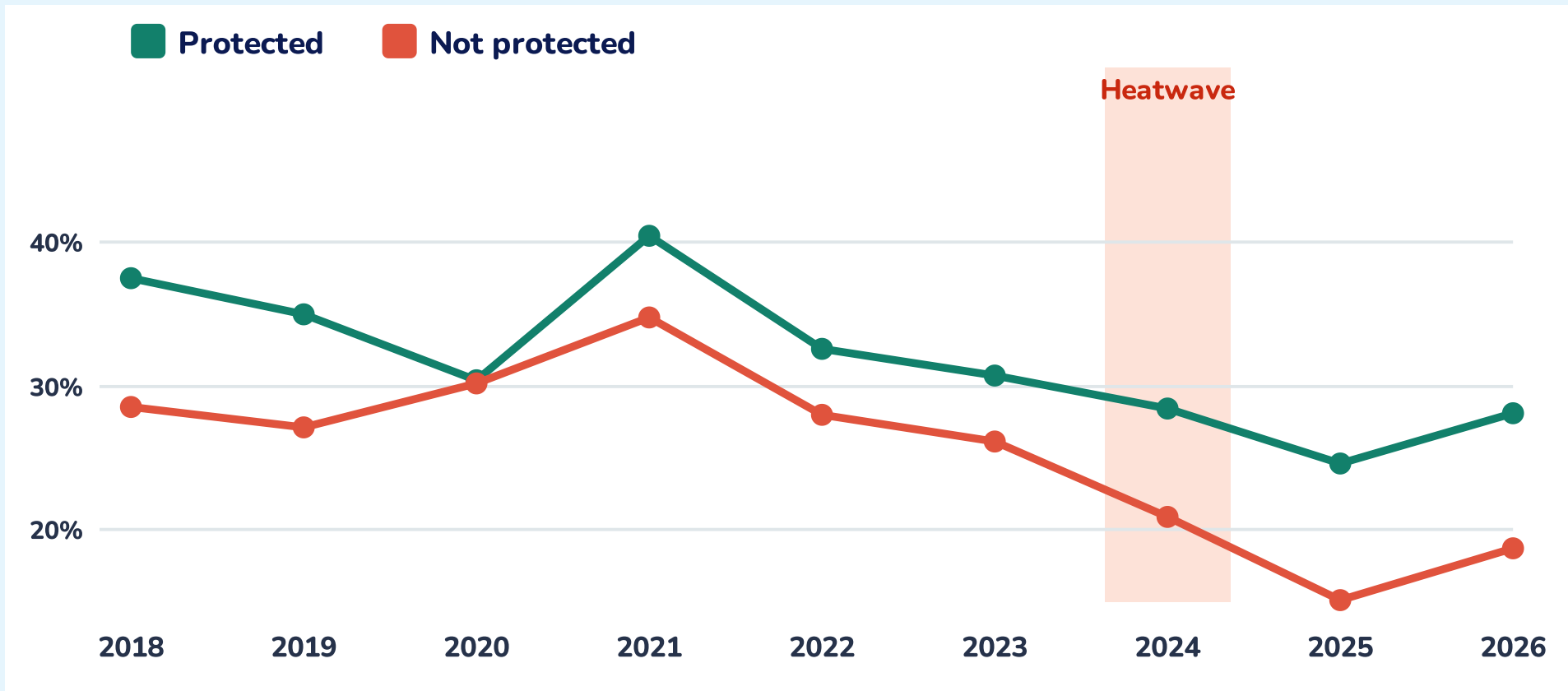
Shortcut

The Starter analysis sheet in the workbook already does this. Change the depth input to compare depths.



Coral cover through the years

Mean hard coral cover per survey, teaching dataset.



How we know: Teaching dataset based on MCP survey records, adjusted for learning



Careful conclusions

Reserves had more coral all along, lost less in the heatwave and recovered faster. That fits the idea that healthy, well-protected reefs, with plenty of grazing fish to keep algae down, are more resilient.

But be careful: this is a teaching dataset, two years is a short time, and other things also changed. How would you check the idea properly?



Talk about it

When exactly did the heatwave start to show up in the data?

Why did coral cover keep falling after the heat had gone?

What would you want to measure next year?

Next time: your own research question



Photos and sources

Photos: bleached coral from MCP's media library. All illustrations drawn for this lesson by Marine Conservation Philippines.

Sources:

- NOAA NESDIS (2026). Fourth global bleaching event likely ended.
- Teaching dataset based on MCP survey records, 2018 to 2026, adjusted for learning.

Full links are in the teacher reading. Free to use and share for education. Made by Marine Conservation Philippines. More free lessons: marineconservationphilippines.org/resources/teachers-resources/

