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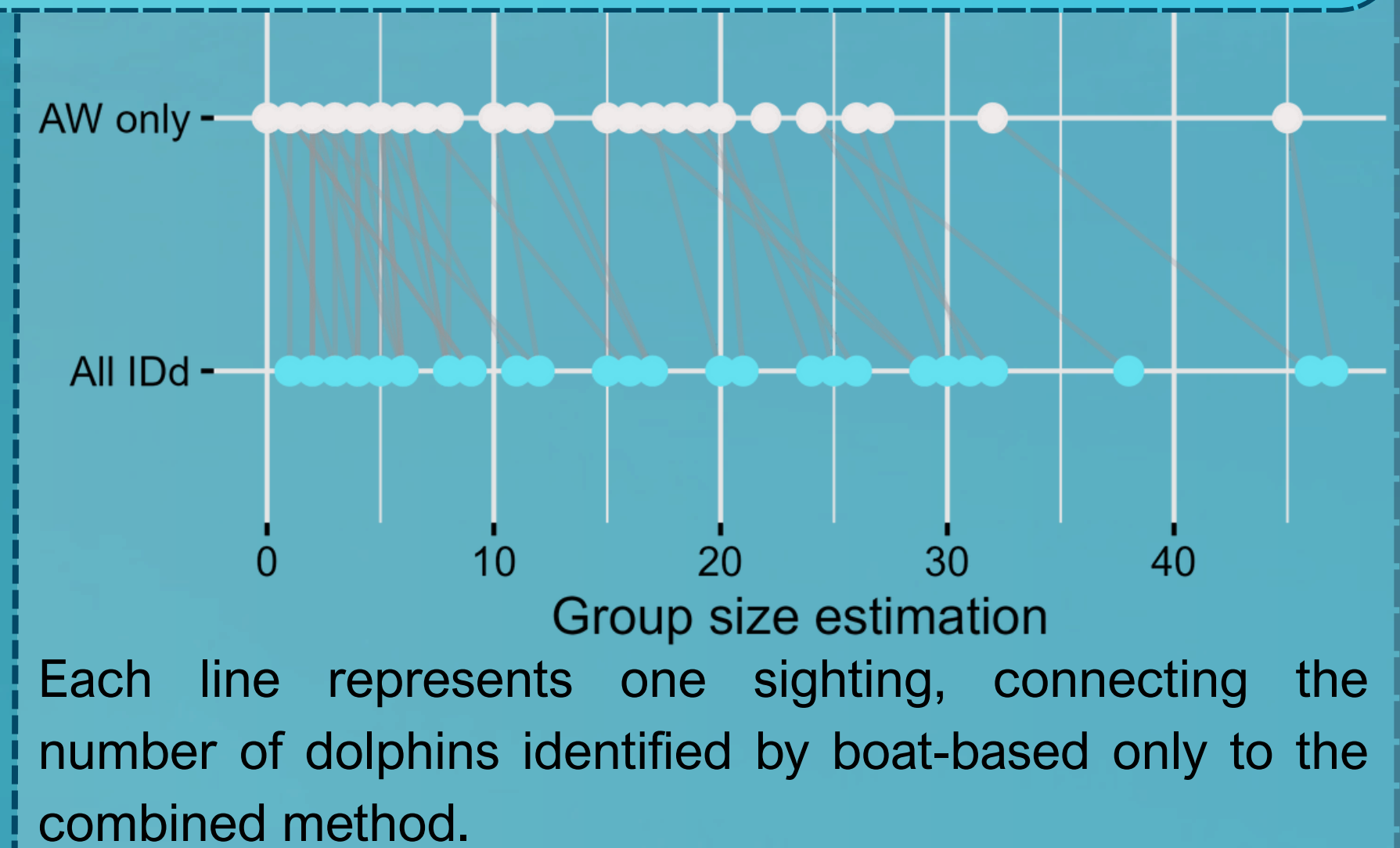
DOLPHIN WATCH
ALLIANCE

Photo-identification is a key, non-invasive method for studying marine mammals, such as dolphins. Traditionally, identification efforts have relied on dorsal fin photographs taken during boat-based surveys; however, this method has limitations. Dorsal fin identification features can change over time, may be obscured, or appear very similar between individuals. This study was conducted in the Northern Red Sea, El Gouna, Egypt, an area under continuous monitoring by Dolphin Watch Alliance (DWA) since 2009. It explores whether supplementing boat-based surveys with underwater photography can enhance identification accuracy for Indo-Pacific bottlenose dolphins (*Tursiops aduncus*). By capturing a 360° view of each dolphin's physical features, the aim is to improve individual recognition and group size estimates, ultimately supporting more accurate population assessments and effective conservation strategies.

Improved Group Size Estimates



Supplementing Boat-Base photography (AW) with Underwater images (UW) identified significantly more dolphins than boat-based identification alone ($t(40) = 6.28$, $p = 1.90 \times 10^{-7}$; 95% CI [2.73, 5.32]): Using boat-based images alone results consistently in underestimation ($\sim 4.02 : \sim 28.2\%$).



<u>Success Rate</u>	YOY	Calf	Juvi.	Sub.	Adult
AW-only	69.7%	53%	73.8%	70.2%	74.9%

- Larger groups benefit most from underwater imagery ($r = 0.625$, $p < 0.001$).
- UW inclusion matches field counts, boosting accuracy ($t(36) = -1.26$, $p = 0.20$).
- UW inclusion rescues low-confidence cases disproportionately (χ^2 , $p \ll 0.01$).
- Moderate AW–UW agreement; each adds unique IDs (Cohen's κ).

T-test/Wilcoxon tests, Pearson correlation, Cohen's Kappa, Logistic regression and different plots.



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