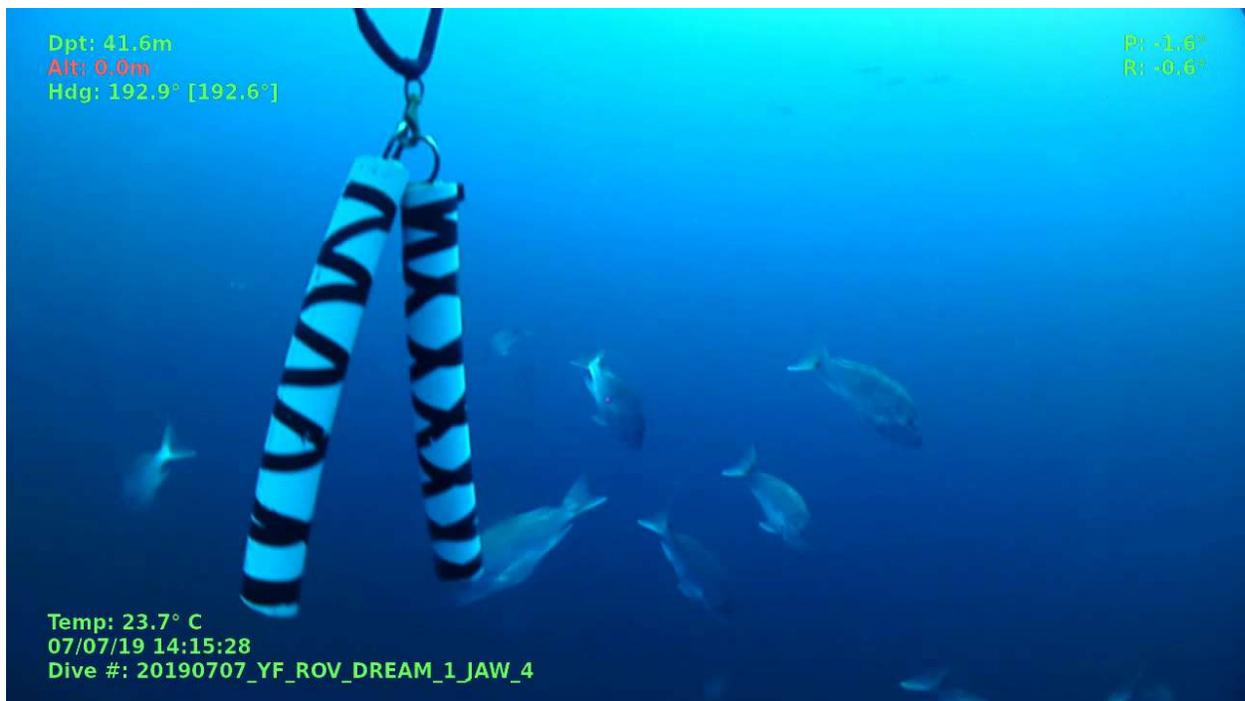


### Quantifying Visibility with a Weighted Secchi Disk that Doubles as a Tether Clump Weight

The Harte Research Institute of Texas A&M University conducts numerous fish studies in the Gulf of Mexico using their VideoRay Defender. At different sites and times, the water visibility can affect the quality of the data they collect, which can impact the way they conduct their transect operations. To help quantify the visibility and "normalize" their data, Jennifer Wetz and her team have created the modified Secchi Disk / Clump Weight seen here.



A Secchi disk is a target-like device used to quantify underwater visibility. It is a simple device that can be used to measure water quality and can be valuable to cross reference visibility when work is conducted at different sites or times.

Normally, a Secchi disk is used from the surface, but for ROVs working deeper, this may not be practical. The following information is provided by Jen Wetz of the Harte Research Institute of Texas A&M University.

In order to quantify and document visibility amongst research sites and surveys, a drop-weight modified Secchi disk method was devised for use with the VideoRay Mission Specialist Defender.

The drop weight is made of 2.5" diameter white PVC pipe cut to approximately 18" length. To add additional weight and an attachment point to the PVC, stainless steel rings were welded to a length of

rebar which was inserted into the PVC pipe and encased in concrete. Final weight was approximately 8-9 lbs. To create the Secchi disk inspired pattern on the PVC pipe, black electrical tape was used.

When deploying the ROV using a weighted tether method, the weight is attached to the tether and used with a "leash" for the ROV to operate around the weight (the "leash" is the section of tether located between weight attachment point and ROV). When performing transect work, the leash length should be great enough to complete the transect length and account for additional maneuverability needed. For example, for 30 m transects approximately 50 m of free tether is used between the ROV and the weight.

For deployment, the ROV is put into the water first, followed by the weight. The ROV pilot can then use the lowered weight as a visual reference to descend vertically to the substrate. Once on the survey site, the ROV will be piloted up to the weight(s) (i.e. nosed up to). Sonar output should be adjusted for distance increments according to your estimate of visibility. For instance, if visibility is poor, increments should be small. The pilot should find the target (the drop weights) visually and on the sonar display screen, and slowly back off until weights are just out of sight while observing video screen. Record the estimated distance to target from the sonar screen. Although the contrast of the Secchi pattern allows for easy visual detection, similar methods can be used with free tether (no weights) on structures or other visual references on site.

Quantifying visibility is important particularly when using video to estimate fish abundances. The recorded data can be used as an additional modeling parameter or as a way to weight the data derived from sites over a range of visibilities.