

# Three-dimensional stereo measurement in visual sampling of fish populations

Calibrated stereo imagery used in conjunction with visual sampling of fish populations allows accurate three-dimensional (3D) length measurement, and in turn accurate estimation of biomass. Changes in length or biomass are key indicators of disturbance.

SeaGIS has a fully integrated suite of software packages that streamline the process of calibration, analysis and 3D measurement.



Calibrating a camera system (D. Abdo)

Stereo images of a calibration cube

**Calibration**  
In order to make 3D measurements, the stereo camera system must be calibrated. Calibrations require a cube (pictured above) and the CAL software package.

Calibration results

## Stereo Imagery

Imagery can be collected from a variety of sources, including diver-swum, remote baited, or towed cameras.



Diver-swum stereo camera system (J. Gilligan)

Imagery

## Image analysis and event logging

The *EventMeasure* software package allows fast analysis of recorded footage:

- Log events for data basing or measurement
- Record behaviour
- MaxN analysis

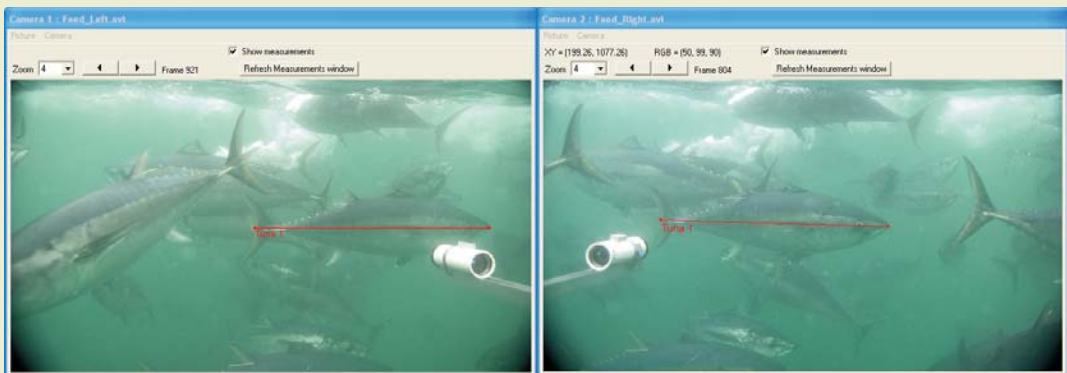
Logged events

## Output

Suitable for reports, spreadsheets and data bases.

## 3D Measurement

The *PhotoMeasure* software package uses calibration data from CAL and integrates events logged with *EventMeasure* to allow fast accurate 3D measurements of length, pose and range.



Stereo length measurement in *PhotoMeasure*