



# ACTIVITY PER DIVE SEGMENT

Activity Per Dive Segment (ADS) is a data product that uses onboard processing of accelerometer and depth data to provide detailed characteristics for individual dives. The algorithm uses a 3-axis accelerometer sampling at 8 Hz and a depth sensor that is sampled at 1 Hz. Any dives  $\leq 52$  min can be analyzed, but longer dives will be ignored. The tag samples and stores sensor data during every dive and continues logging data until the tag returns to the surface. At the end of each qualifying dive, the sensor data are processed and the results, along with the raw data, are stored in the tag's archive. In addition to being stored on the tag, the processed results are opportunistically transmitted to the researcher via Argos.

## Tags Containing This Data Product

Prototype SCOUT-DSA

## Data

Each qualifying dive (parameters that you set when programming the tag) is broken into six segments using a Broken Stick algorithm. For each dive segment, a count of "active events" will be reported.

**Activity Counts:** calculated for each dive segment following these steps:

1. Calculate the Standard Deviation (SD) of each Ax, Ay, Az axis over a 3 second window ( $SD_{xi}$ )
2. Calculate the "mobile variance" vector:  $Mob_i = SDx_i + SDy_i + SDz_i$
3. Calculate the population mean of  $Mob$
4. Center the  $Mob$  data values:  $Centered_i = Mob_i - \text{mean}(Mob)$
5. Identify the Active Event threshold:  $Threshold = |\min(Centered)|$ 
  - a. These data have a right-skewed Normal distribution so the absolute value of the minimum identifies the beginning of the "tail" of the distribution.
6. An "Active Event" occurs when  $Centered_i > Threshold$  (i.e. the data are in the tail of the distribution).

The mean and standard deviation of the "mobile variance" (calculated in step two) are also reported. These metrics are reported as a way to determine if the overall activity varied between dives.

To Learn More Call: +1 (425) 881-3048 or Email: tags@wildlifecomputers.com