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difficulties. Capture and release of white sharks is very undesirable, not only due to ethical considerations, but also due to the unknown survival rate of white sharks following capture. Attachment and retrieval of instruments must be accomplished while the shark is free swimming. Furthermore, the white shark is elusive, creating the possibility that we will not re-encounter an individual following tagging. Pop-up satellite technology addresses these requirements in every way. Not only are we able to attach the tags on to free swimming animals,

but retrieval of data does not require the animal to be located.

The research team arrived in Mossel Bay on 23 July 2001, and boarded the sailing vessel *Infante* belonging to Roy and Jackie Portway (Shark Africa). Ryan Johnson, Michael Scholl, Mike Patterson and Stefan Swanson constituted the field team. On 24 July, the team finally observed a large female shark close to 450 cm in length, and shortly afterwards, the tag was successfully attached on the shark with a modified spear gun.

This Pop-up Tag will remain attached to the shark for a year. On 1 July 2002, the tag will detach itself automatically from the shark, and "pop-up" to the surface, where the tag will link to the Argos satellite system and download all the information archived over the year. During that one-year period, the tag will record water temperature and the depth at which the shark is swimming. Additionally, the tag will also record the amount of light surrounding the shark, and from that determine sunrise and sunset times. Knowing these two times, it will be possible to calculate the position of the shark on a map. This positioning system is not as precise as the position obtained with a GPS, but this system is more reliable as the shark does not have to break the surface and much more information about the whereabouts of the shark is stored. This is a first in South Africa, and most probably not the last!

Depending on the results of this first attempt, the project probably will deploy several more tags such as these Pop-up Satellite tags next year (2002). We are very optimistic and hopeful that this kind of technology will shed light on a number of mysteries concerning the white shark. ❖



Archival Pop-up tags record the water temperature and depth as well as the time of sunrise and sunset each day. These times are transmitted back to the user via Argos after the tag pops up. They are subsequently used to calculate a daily location estimate and hence reconstruct the track of the fish.

And the winner is...!

The drawing for the winners of the 70 gram GPS PTT and 18 gram solar PTT will be made December 7 at our Tenth Anniversary Celebration and Holiday Party. The winners' names will be posted on our website immediately after the drawing on December 7, 2001.



The Microwave Telemetry, Inc. web page will be updated in January 2002. Be sure to check us at www.microwavetelemetry.com for new products and updated information.

School Projects Update

We are happy to report that the school projects we sponsored are in full swing. Look for articles in upcoming newsletters and links from our website to participating schools.



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