

Goddard Tech 12

Each month the Strategic Partnerships Office will tell the story of renowned innovators at NASA's Goddard Space Flight Center and show how their technological breakthroughs are brought from the labs to our lives. This month features AeroPods, which allow aerodynamically stabilized imaging and sensing. Inventors Geoff Bland and Ted Miles are licensing this technology to schools aiming to provide hands-on STEM experience to students.

The Technology

AeroPods

Since the 1990s, NASA's Geoff Bland has developed small unmanned aircraft and instrument systems for Earth science research. After leading the creation of the first small electric drone equipped with research sensors, he became interested in smaller, cheaper alternatives. Tethered kites were his first thought, but traditional stabilizing tools got tangled and weren't effective enough. With the help of NASA technician Ted Miles, the team set out to build something much better.

The resulting AeroPod is an aerodynamically stabilized device not directly attached to the kite, but to the kite string. The AeroPod can be equipped with remote sensors designed to gather Earth science data. Simple and cost-effective as compared to drone alternatives, the AeroPod can be used effectively after only one day of training. Some applications include agriculture and environmental research, wetland studies, archeological and geological mapping, crop monitoring and yield estimates, and documenting forest canopy.

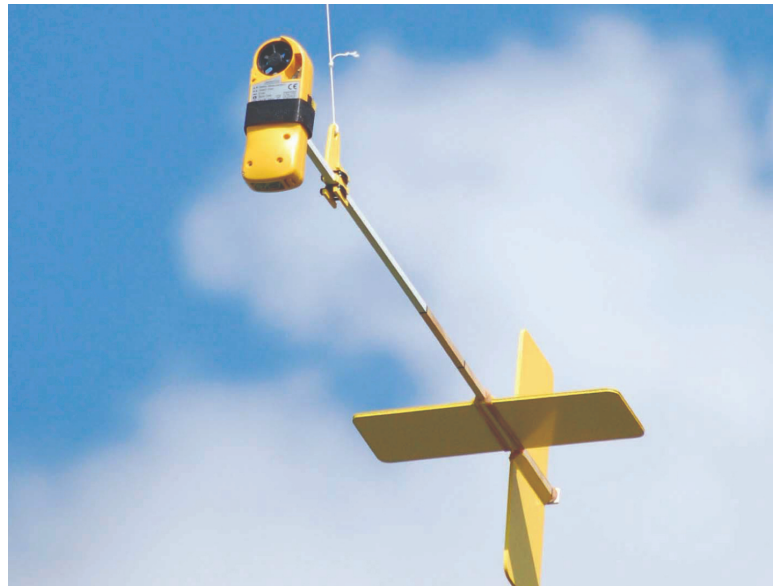


Photo Credit: NASA Technology Transfer Program

What is Measurable



Air temperature and humidity



Wind direction and speed



Water Conditions



Ground Temp and Moisture



Cloud Coverage



Barometric Pressure

The Partnership

AEROKATS & RESA

In 2010 Wayne Regional Educational Service Agency (RESA), which supports schools in Wayne County near Detroit, had students comparing water quality in Michigan's Upper Peninsula with the rest of the state. During this research, it occurred to the group that the conditions at the water collection sites weren't being monitored.

After looking into monitoring more, RESA contacted Geoff Bland expressing interest in monitoring ponds and streams via cameras in the sky. With the recently invented AeroPods, Bland was excited at the opportunity to collaborate with schools and students. RESA received a small NASA award to explore options in monitoring water collection sites, and the project's success was ramping up to much bigger things.

RESA and Bland continued to work together and came up with the Investigating Climate Change and Remote Sensing (ICCARs) Project. This project was much more expansive than just monitoring water quality test sites. The team developed 60 lesson plans for middle and high school students aimed at giving hands on experience in the STEM field, particularly remote sensing. The program allows students to gather Earth-imaging data and draw conclusions about the Earth on a local level. The program grew into the AEROKATS and ROVER Education Network which, in addition to AeroPod research, now includes remote watercrafts for gathering in depth water data.

In lieu of any monetary payment, Goddard's Strategic Partnerships Office created an educational license for AeroPod use. Licensors are required to share any data they collect of interest to NASA and give feedback on the device.

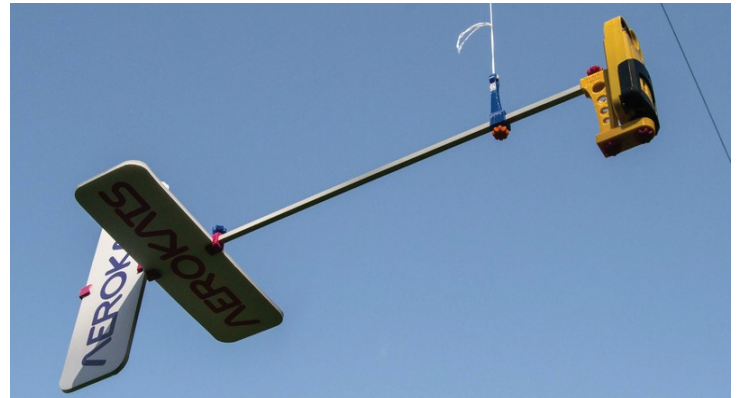


Photo Credit: NASA Technology Transfer Program (Above and below image)



The Innovators

Geoff Bland

Bland started his NASA career at Langley Research Center in 1979, then moved to Goddard's Wallops Flight Facility in 1982, where he has worked since. He has been a payload manager, performance analyst, mission manager, and for the last 21 years, a research engineer. In addition to dozens of publications and a patent for AeroPods, Bland also received Goddard's James Kerley Award for Technology in 2014.

Ted Miles

Miles, now retired, spent much of his time at Goddard as an aerospace technician. Technicians play an integral role in missions success, as they work with scientists and engineers in support of their research. Technicians like Miles use their skills to operate wind tunnels, work in laboratories, and build models which support many types of research.