2B Technologies
An InDevR Company

2B Buzz

Fall, 2012

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Welcome to our second installment of 2B Buzz, the one-of-a-kind customer newsletter published quarterly by 2B Technologies. Over the summer, business was steady thanks to all who placed orders. We continue our efforts to get the word out about the GO3 project, adding more participating schools and updates to the GO3 websites. We kindly ask as you prepare for the end of 2012 to consider making a charitable donation to the GO3 Project. Now sit back and enjoy the articles we have prepared for you this quarter.

Best Regards,
2B Technologies

Monitoring Tip

Use of Inlet Tubing

2B Tech Ozone Monitors may be used with or without inlet tubing. The Swagelok inlet connector accepts standard ¼-in o.d. tubing. It is important that the interior surface of the inlet tubing be an inert material such as PTFE, FEP or PFA. 2B Tech provides Teflon-lined Tygon tubing in lengths up to 50 feet. This tubing has the inertness of Teflon and flexibility of Tygon. Some users mistake the tubing to be Tygon itself. Tygon tubing outgases plasticizers that react with ozone and contaminate the interior surfaces of the ozone monitor, causing large offsets and false readings. Never use Tygon or any non-fluorinated polymer as your inlet tube!

Tech Note #012 describes the use of 50-ft of Teflon-lined Tygon inlet tubing on a Model 205 Ozone monitor. There is no significant loss of ozone with this length of inlet tubing. The tubing caused a small pressure drop (0.15% per foot) and a negative offset of 2.0 ppb that can be corrected for by zeroing the instrument with an ozone scrubber attached to the entrance of the inlet tube.

Inlet tubing will slowly become contaminated by compounds that react with ozone. As a result, long inlet tubes can cause a zero offset and loss of sensitivity to ozone. We recommend that instruments with long inlets be calibrated frequently with zero and span gases introduced at the tubing inlet (e.g., by use of a Model 306 Ozone Calibration Source). Inlet tubes can be cleaned by rinsing with methanol and blowing dry.

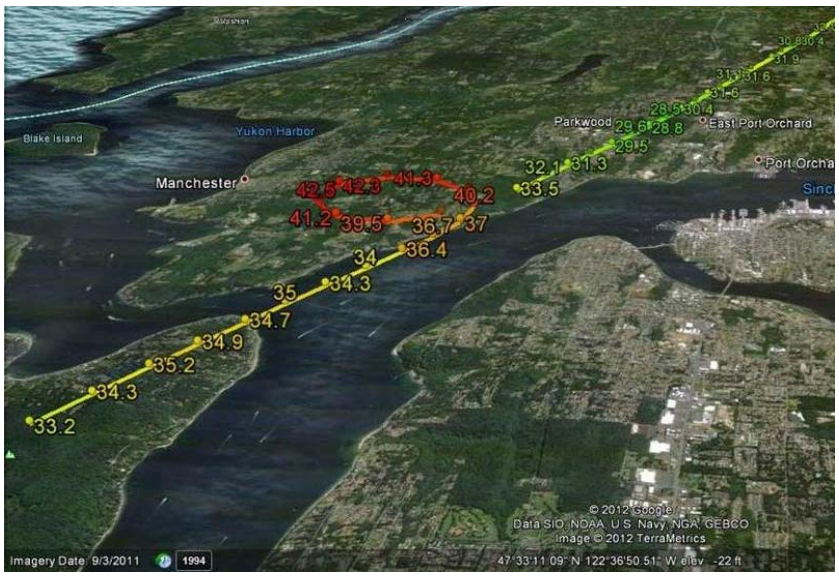
Another consideration is that ozone will react to a small extent with ambient NO during the residence time within the inlet tube. For this reason, inlet tubes should be as short as possible. If the tubing dimensions, flow rate and ambient NO concentration are known, a correction may be made for ozone loss from this

mechanism.

Case Study: Aerial Ozone Monitoring in Washington

Since 2007, the State of Washington has used 2B Technologies Ozone Monitors to measure ground level ozone throughout the state. In the summer of 2012, they conducted an aerial ozone monitoring demonstration directed over western Washington. The overall purpose was to demonstrate a working monitoring tool by installing 2B's Ozone Monitors on an aircraft. Two instruments were installed in a Pelican case with particle filters, GPS capabilities and flash cards then loaded on a Kenmore Air deHavilland Beaver for an 8hr flight (see below).

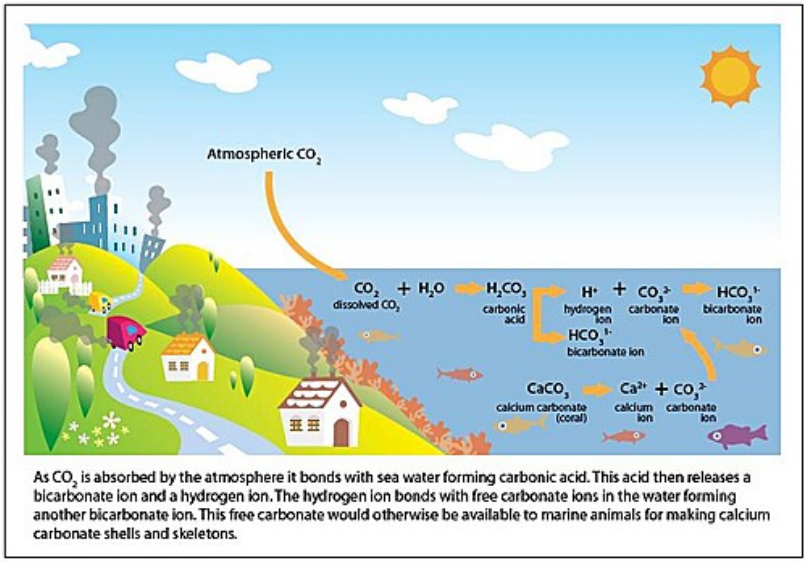
Each instrument was responsible for taking measurements at different time intervals to get an idea of current ozone concentrations. The picture below shows the path of the aircraft and the measurements received.



Overall, the instruments portability, precision and accuracy permitted them to be a successful monitoring tool when installed on aircraft. The data points received at different time intervals were comparable and between each flight, the 2B Monitors proved stable accuracy when tested against the laboratory standard.

For more infomation, contact Donovan Rafferty at draf461@ecy.wa.gov.

Ocean Acidification: Acceleration Observed Due to CO_2 Emmisions



Ocean acidification is a process by which the ocean water absorbs carbon dioxide (CO_2) from the atmosphere, or from the breakdown of organic matter, in turn causing a chemical reaction that leads to the water becoming more acidic. This process affects the growth of shells and skeletons in marine animals such as scallops and corals because it allows for less free carbonate ions.

Two NOAA scientists have found that eutrophication, which is the production of algae at a higher rate in areas where there are excess nutrients (such as nitrogen and phosphorous), is a large source of CO_2 in coastal waters. William G. Sunda and Wei-jun Cai have stated that given the projected CO_2 being released from decaying organic material and the current atmospheric CO_2 concentrations, seawater acidity has the potential to nearly double in waters with higher salinity and temperature. As for waters with lower salinity and lower temperatures, the acidity could rise almost 12 times the current levels.

For more detailed information from NOAA, please click here. Credits for the picture and general information can be found here.

Featured Product: Personal Ozone Monitor (POM)

2B Tech has taken the next step in miniaturization of UV-based ozone monitors by developing the Personal Ozone Monitor or "POM". The POM, introduced in June 2012, has dimensions of 4 x 3 x 1.5 inches and weighs only 0.75 lb (340 g). It has a built in GPS so that ozone measurements may be logged continuously along with geographic location. By folding the optical path in the shape of a "U", it was possible to achieve the same path length in the POM as in the Models 202, 205 and 106-L and thus have similar precision and accuracy (~2 ppb). For more details see: POM