Ground level, ambient ozone (O$_3$) concentrations are currently regulated by the US EPA as an 8-hr averaged concentration of 75 ppb (parts per billion), which can be exceeded no more than three (3) times per calendar year.

Unlike many other regulated pollutants, O$_3$ does not have any significant direct sources. Rather it is photochemically formed in the atmosphere via a complex, non-linear grouping of chemical reactions involving sunlight and numerous precursor compounds, including oxides of nitrogen (NO$_x$) and hydrocarbons (HCs or VOCs). Additionally, a given region’s observed O$_3$ concentrations can be impacted by regional and long-range transport of O$_3$ or its precursor compounds.

The 2015 Great Salt Lake Ozone Study (GSLO3) is designed to examine the potential influence of the lake on ground level ozone observed in populated areas primarily along the Wasatch Front.

Pairing AggieAir’s autonomous “Minion” UAV Platform with a customized O$_3$ monitor would allow effective and economical horizontal and vertical spatial mapping near and over the Great Salt Lake.

METHODOLOGIES

- **AggieAir “Minion” UAV Platform** (see Table 1 and Figure 1)
  - GPS programmed/controlled; data logged every ½ second
  - position (latitude and longitude)
  - elevation (meters above sea level)
  - vehicle air speed
  - wind speed and wind direction derivable
- **Tech2B Technologies Model 205 Portable UV Photometry Ozone Monitor** stripped-down and customized to fit in the UAV payload bay (see Figure 2)
  - 10 second sample time (minimum possible)
  - Federal Equivalent Method (FEM, EPA-approved)
- **HOBO (exposed bead) temperature sensors/dataloggers**
  - paired HOBOs used for redundancy (see Figure 3)
  - 5 second averaging time
- **FAA approval (COA)** obtained to fly the UAV within a 4-mile diameter circle, up to 600 m AGL, based at the southern tip of Promontory Point
  - actual flight pattern bisected the lower edge of allowed circle (see Figure 4)
  - flew horizontally at 50 or 100 m increments to the maximum elevation
- **Flights carried out** July 15, 2015 (1 flight) and Aug. 11, 2015 (4 flights)