

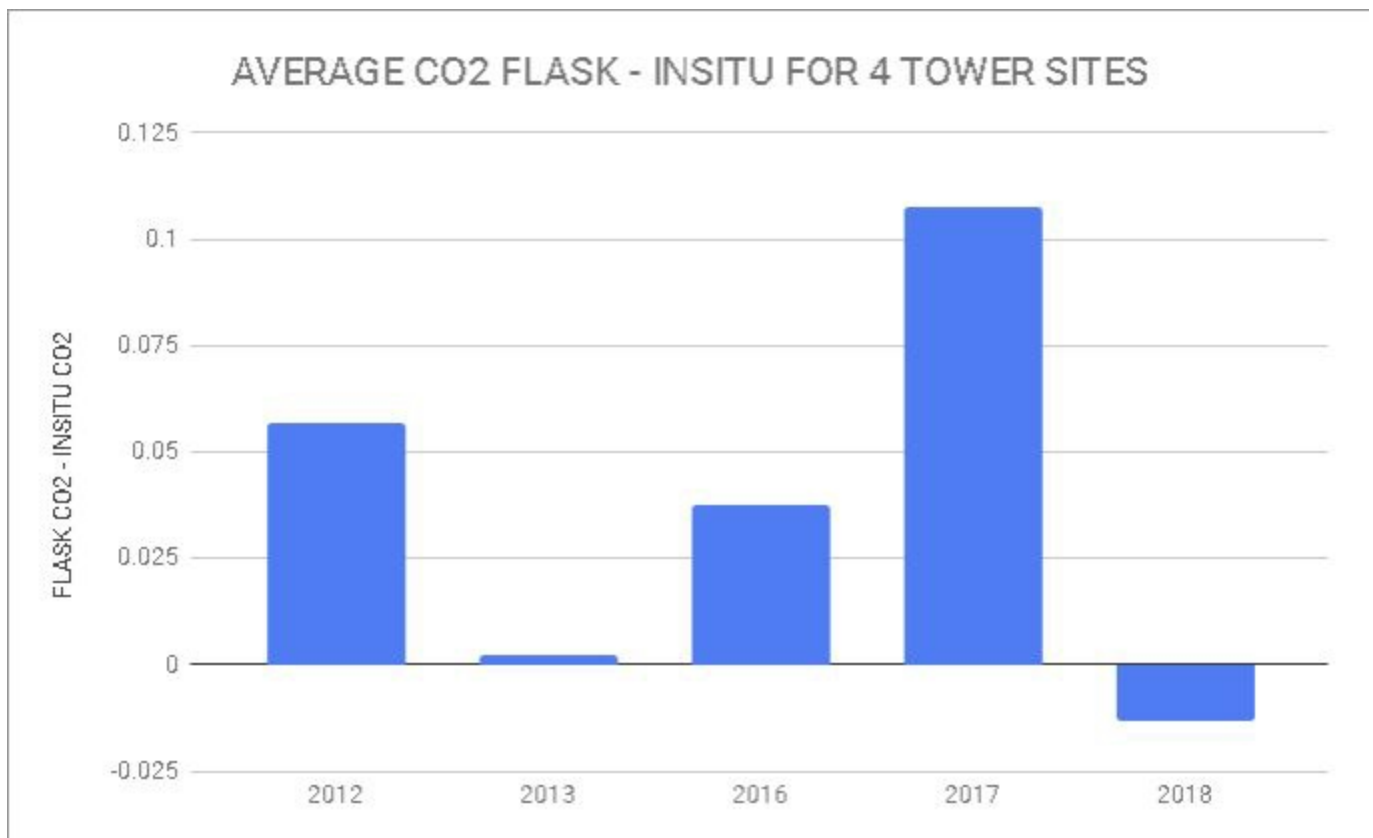
## Tower *in situ* and Flask CO<sub>2</sub> Comparisons

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Programmable Flask Packages (PFP's) containing twelve glass flasks are used to take samples at NOAA aircraft and tall tower network sites. Measurement of flask samples taken at tower sites are compared to simultaneous *in situ* measurements. Around 2009 or 2010 we noticed that some flasks would have anomalously high CO<sub>2</sub> at tower sites when compared with *in situ* measurements. Lab tests to understand the high CO<sub>2</sub> values revealed some flasks develop offsets that are triggered by humidity. It was determined that pre-filling flasks with sample air could reduce the offsets. Statistical agreement between flask and *in situ* comparisons at tower sites improved from showing +0.1 ppm CO<sub>2</sub> offset to a close 0.0 when an appropriate prefill strategy was implemented. History of prefill strategy and changes to CO<sub>2</sub> flask - *in situ* is discussed.



**Figure 1.** In years 2013 and 2016 longer prefill strategies were implemented resulting in better flask *in situ* agreement than other years.