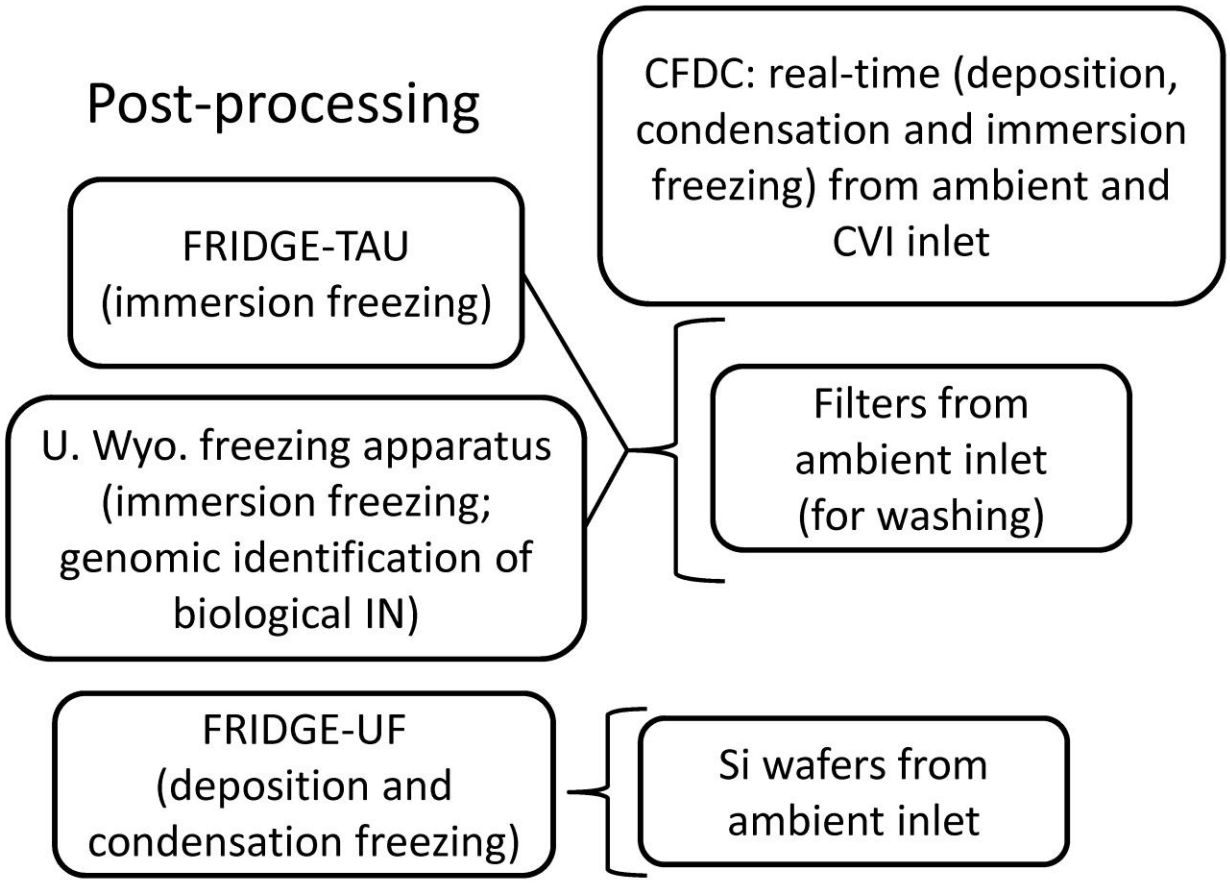
Colorado State University

Ice nuclei measurements

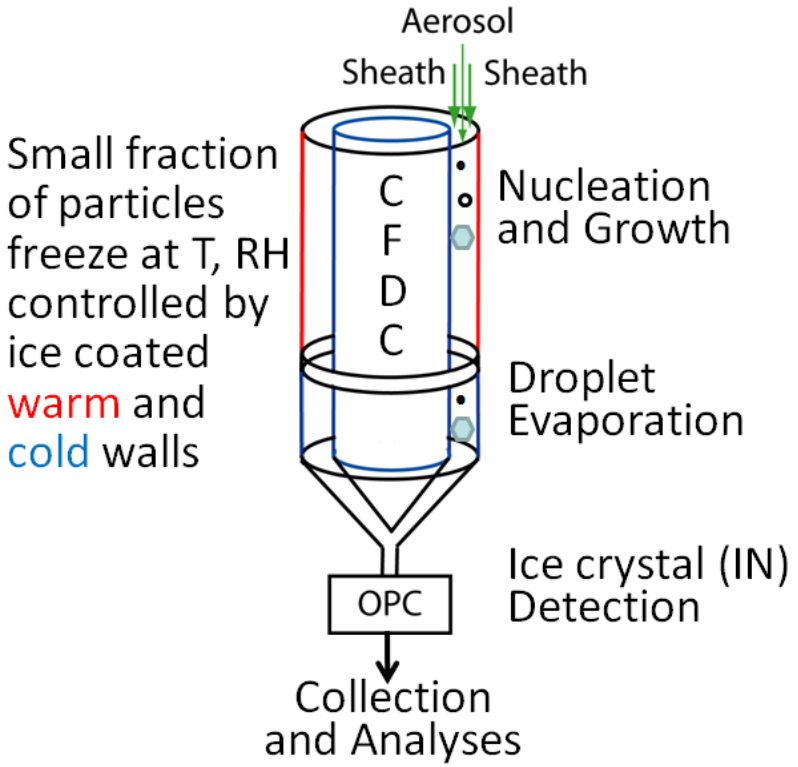
Mostly **Paul** with a little Gavin

Thanks to NSF (Award #: 1036028), Ryan Sullivan, Tony Prenni and all ICE T folks

Aircraft collections and processing (MBL, SAL, mid-levels)



Continuous Flow Diffusion Chamber (CFDC)



- Measures the numbers of particles per volume in air capable of nucleating an ice crystal under specific conditions

Progress so far…

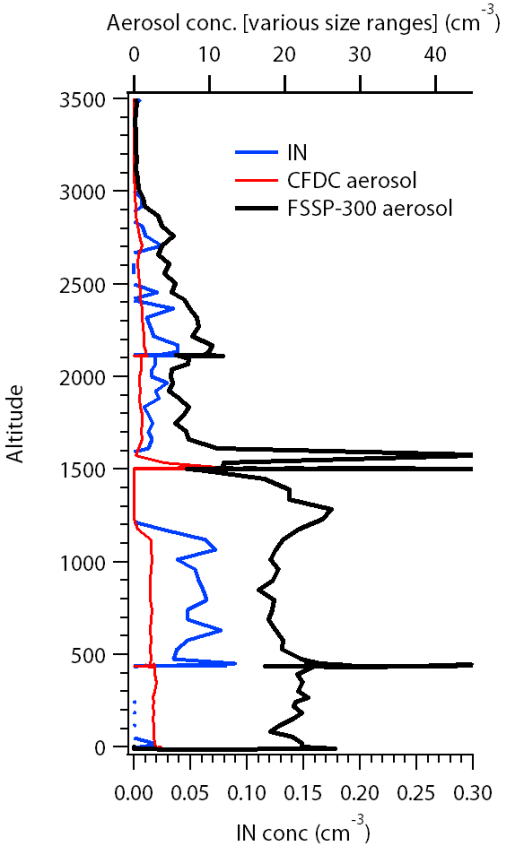
- Good coverage for filters and FRIDGE wafers
- CFDC sampling problems:
  - Sticky valve causes loss of condition control
  - Icing problems: warm cabin = poor icing = high instrument background = poor signal to noise
  - Flow problems at high altitude (P < 550 hPa)
- Still able to get some data on each flight despite problems, but would like more!

Data coverage

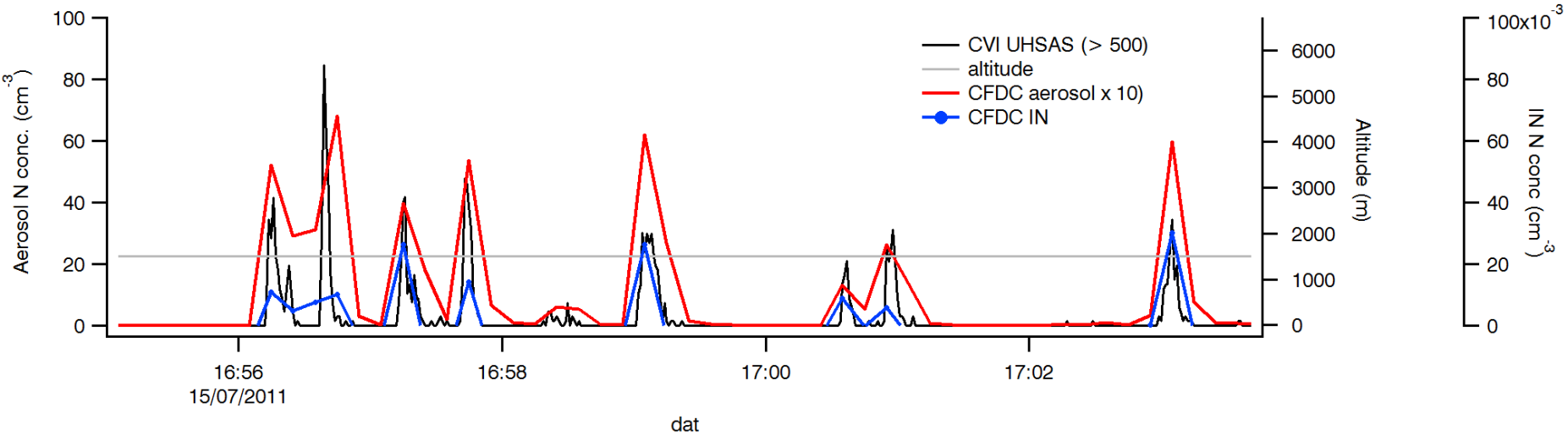
- **Filters** for MBL (1, 4-7), SAL (2), ground
- **Wafers** for MBL (2, 4-7), SAL (2 & 6), cloud base (3, 6, 7), free trop (5 & 7)
- **Partial CFDC** (1-7), all conditions

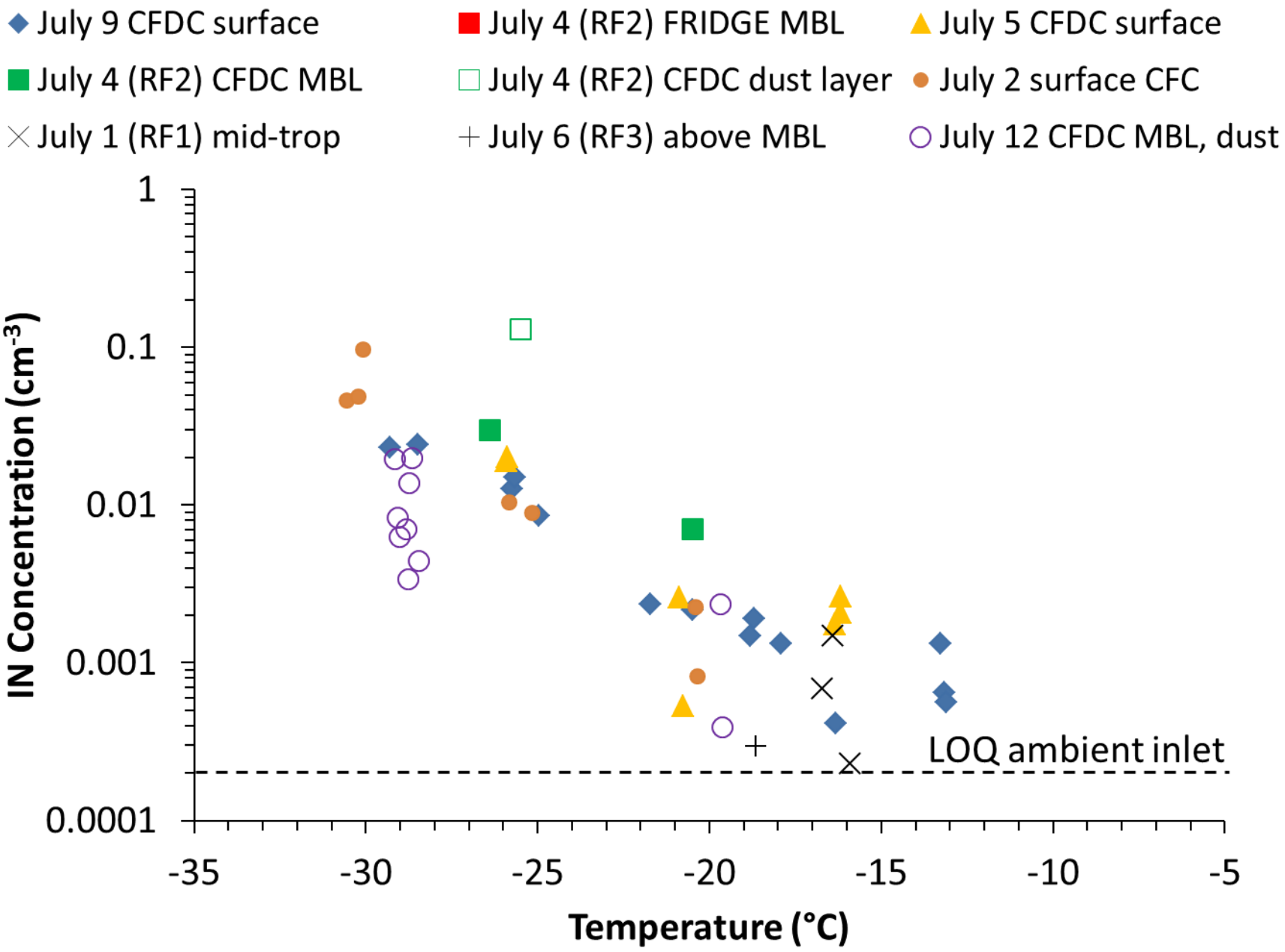
CFDC examples

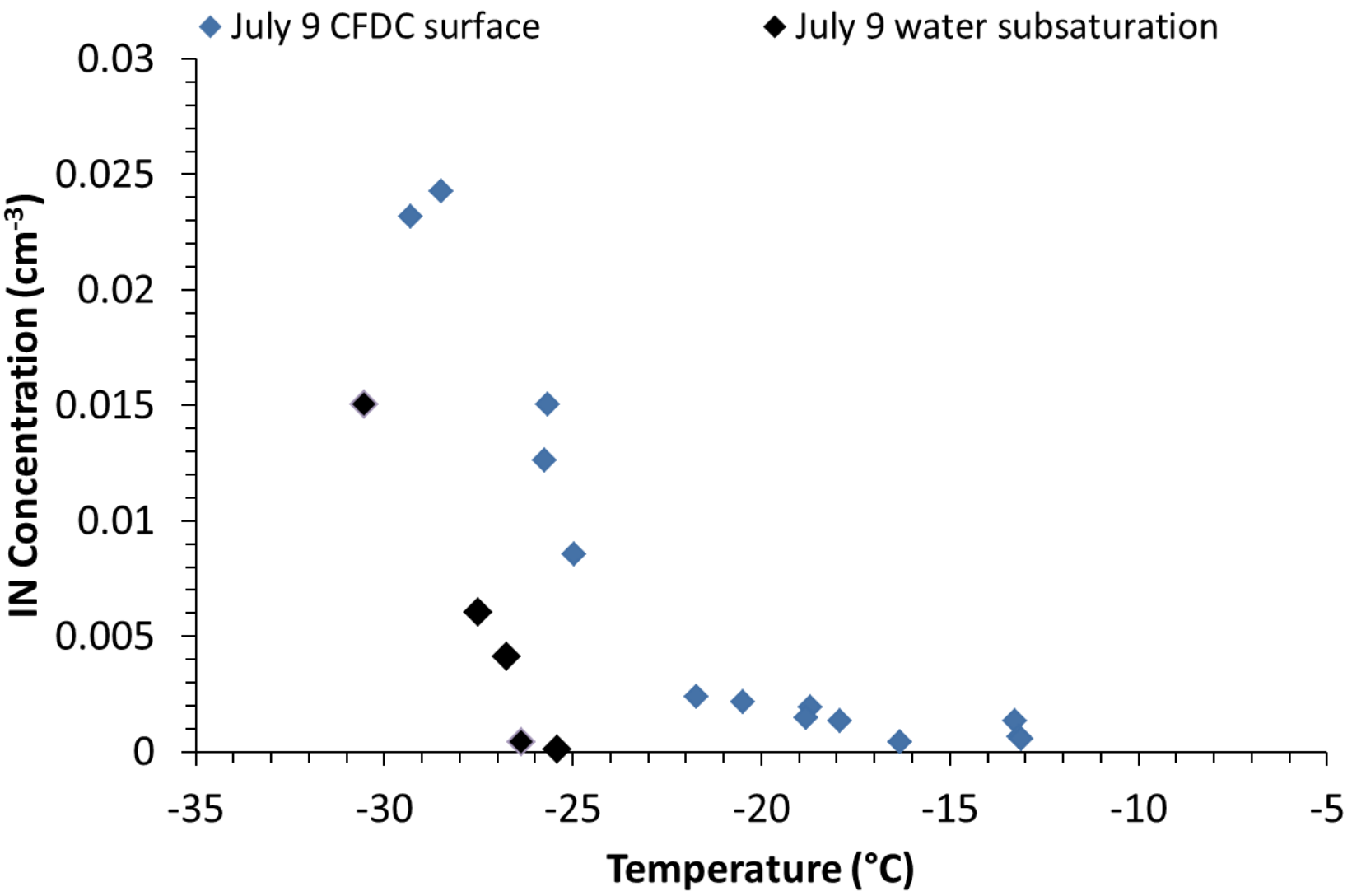
Profile through dust layers (RF06) at T = -25 C



CVI sampling (RF06) at T = -25 C




July 9 CFDC surface
July 4 (RF2) FRIDGE MBL
July 5 CFDC surface
July 4 (RF2) CFDC MBL
July 4 (RF2) CFDC dust layer
July 2 surface CFC
July 1 (RF1) mid-trop
July 6 (RF3) above MBL
July 12 CFDC MBL, dust
IN Concentration (cm-3)
1
0.1
0.01
0.001
0.0001
LOQ ambient inlet
-35
-30
-25
-20
-15
-10
-5
Temperature (°C)


July 9 CFDC surface
July 9 water subsaturation
IN Concentration (cm-3)
0.03
0.025
0.02
0.015
0.01
0.005
0
-35
-30
-25
-20
-15
-10
-5
Temperature (°C)

We would like more of…

…everything. More of the same.