



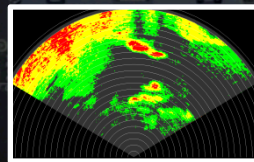
Description of the Radar Data Collected, the Visualization Tools Utilized, and the Statistical Properties of the Radar Reflectivities Observed by the X-band, Airborne, Weather Radar during the 2015 HAIC-HIWC Flight Campaign

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The authors wish to thank and acknowledge technical/programmatic support and access to HAIC data from the following HAIC/HIWC Science/Flight Team Members:

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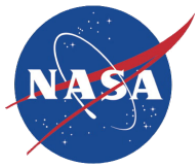
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Toulouse, FRANCE

HAIC-HIWC Science Team Meeting
09-13 November 2015



2015 HAIC/HIWC Flight Summary

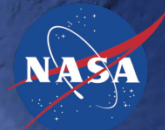
Data Table

(hh:mm, UTC)

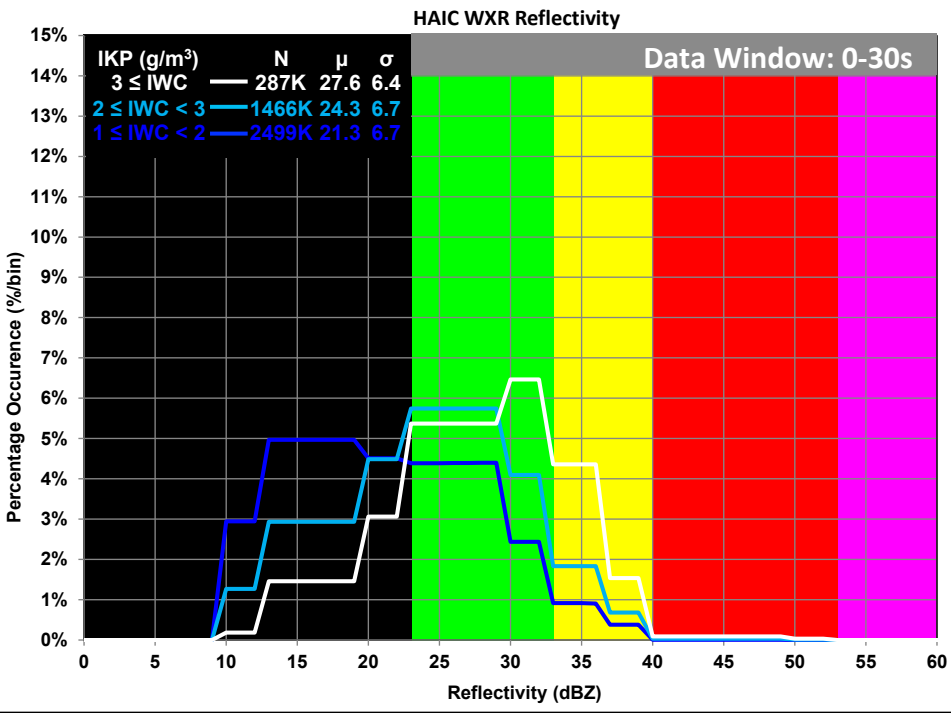
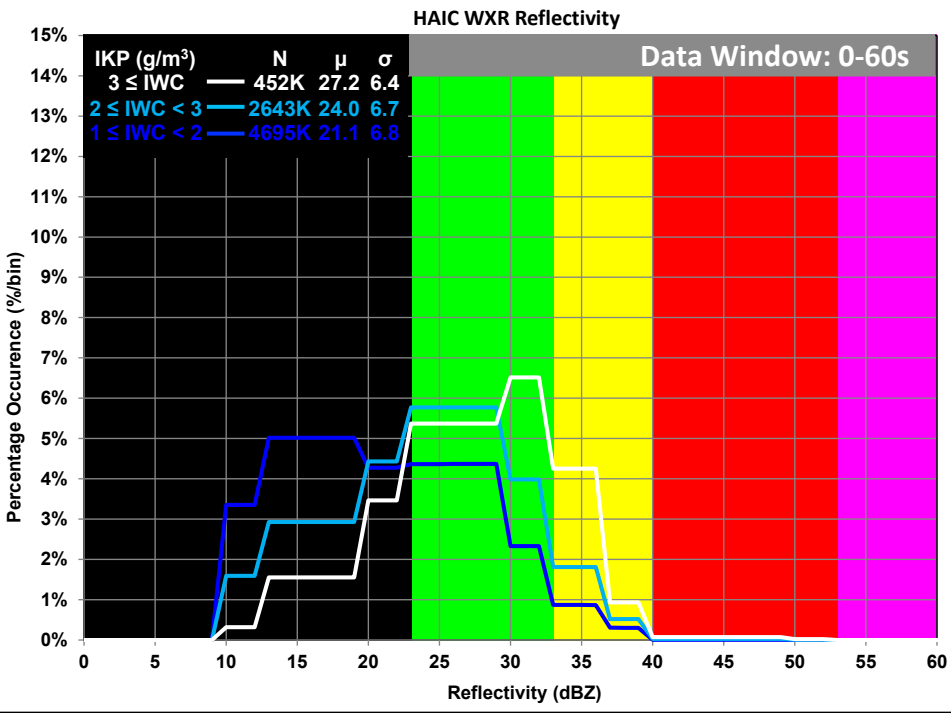
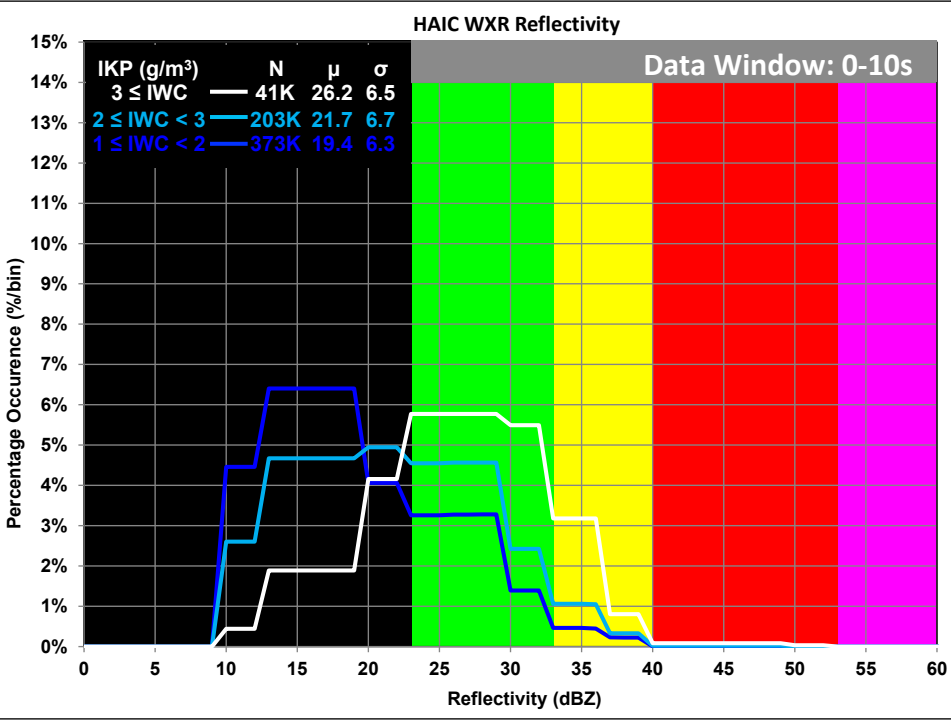
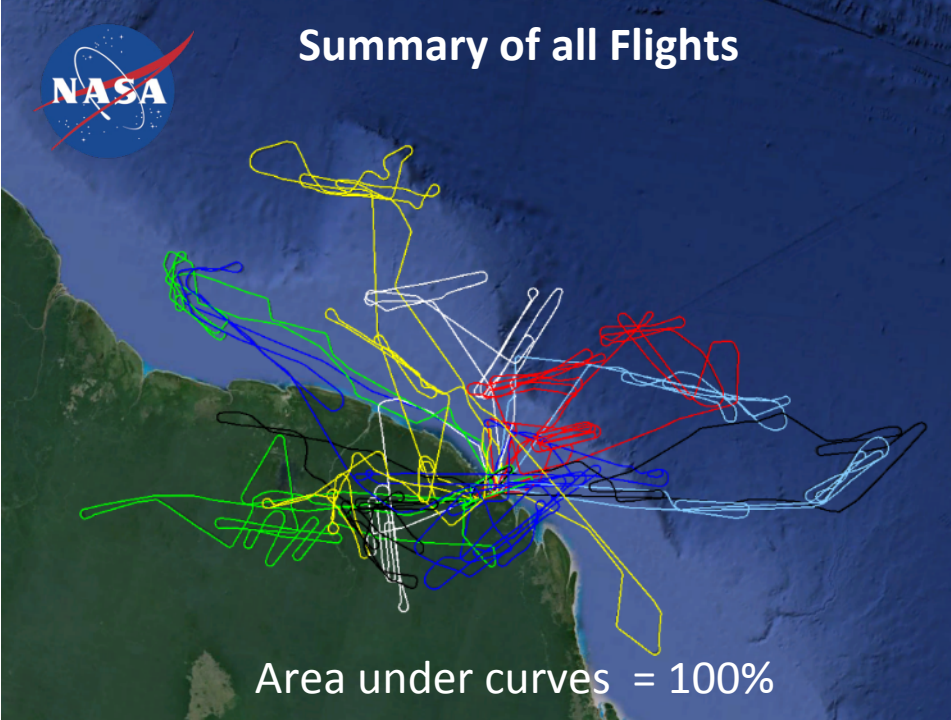


Flight Number	Date	Radar Data (hh:mm, UTC)		Aircraft Data (hh:mm, UTC)		IKP Data (hh:mm, UTC)	
		Start	Stop	Start	Stop	Start	Stop
fs150009	5/9/2015	16:09	18:36	15:35	18:43		
fs150010	5/10/2015	18:55	21:17	18:33	21:27	19:39	21:05
fs150011	5/12/2015	19:54	22:15	19:37	22:34	20:28	22:06
fs150012	5/14/2015	13:57	17:07	13:40	17:21	14:49	16:57
fs150013	5/15/2015	8:35	12:06	8:09	12:14	8:56	11:36
fs150014	5/16/2015	8:08	11:50	8:01	12:01	8:37	11:33
fs150015	5/16/2015	15:51	18:29	15:35	18:37	16:20	18:16
fs150016	5/18/2015	19:27	22:29	19:27	22:47	19:47	22:20
fs150017	5/19/2015	14:19	17:27	13:49	17:33	14:51	17:08
fs150018	5/23/2015	9:14	12:36	8:49	12:53	9:29	12:18
fs150019	5/23/2015	15:23	18:59	15:00	19:12	15:35	18:40
fs150020	5/24/2015	8:51	12:08	8:36	12:11	9:02	11:51
fs150021	5/25/2015	19:07	22:30	18:54	22:45	19:24	22:15
fs150022	5/26/2015	8:33	11:59	8:08	12:02	8:42	11:42
fs150023	5/26/2015	13:10	15:51	12:54	16:00	13:23	15:32
fs150024	5/27/2015	8:27	11:58	8:06	12:12	8:36	11:37
fs150025	5/28/2015	19:25	22:50	19:00	22:58	19:39	22:31
fs150026	5/29/2015	8:47	12:06	8:25	12:10	9:01	11:49

- All Radar Imagery has been Reviewed
- KMZ Files have been generated for all flights
- Received preliminary IKP data and events identified
- Radar reflectivity stats have been prepared



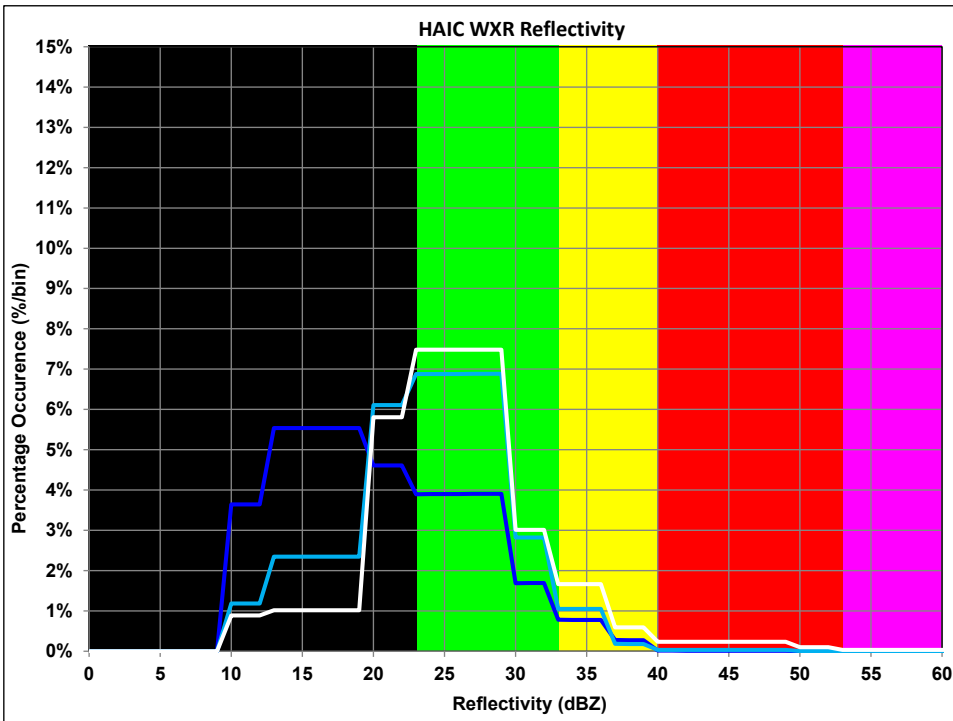
Summary of all Flights



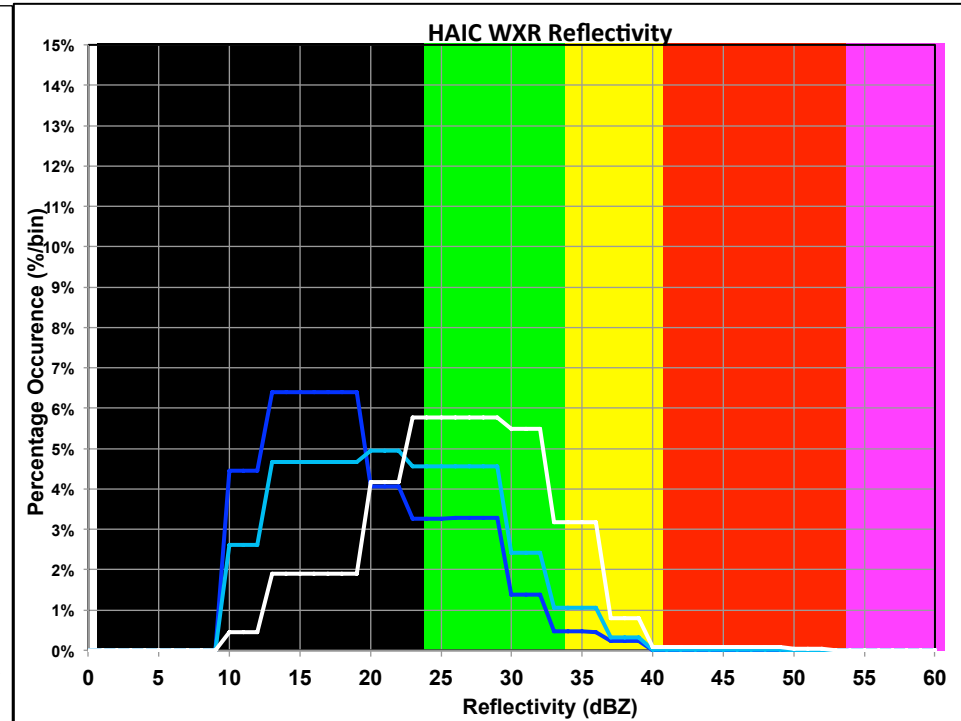


Comparison of Radar Reflectivities *Pilot's X-Band Weather Radar*

Darwin 2014



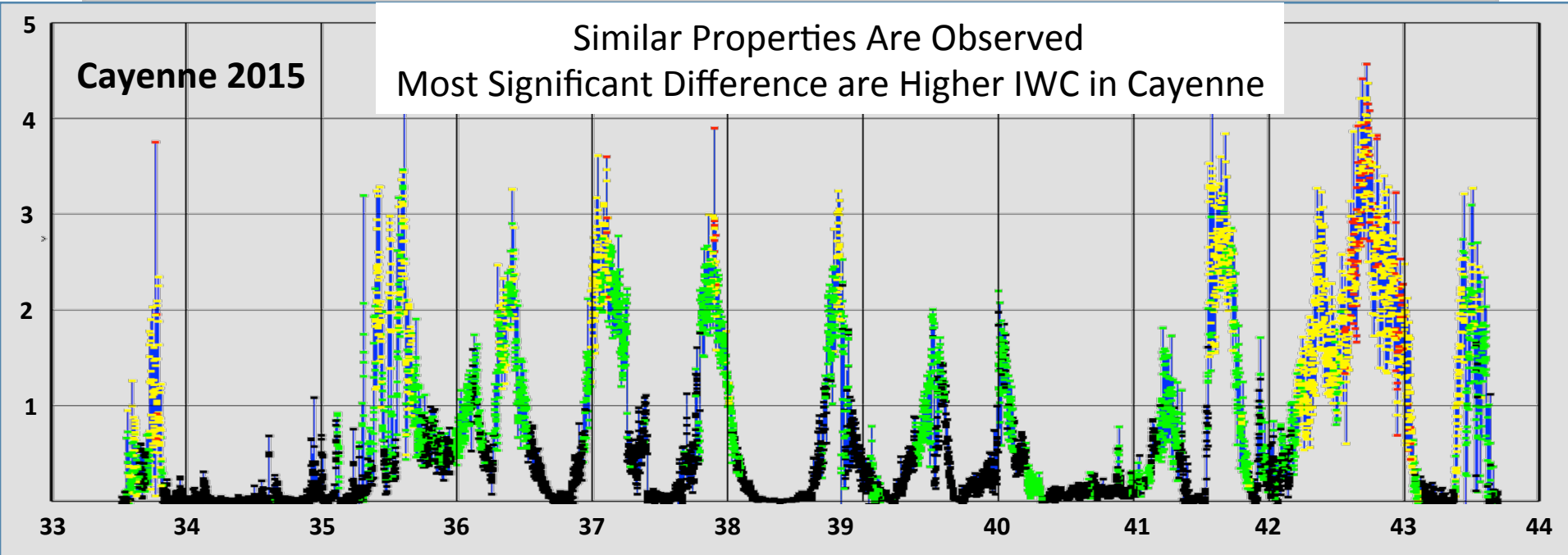
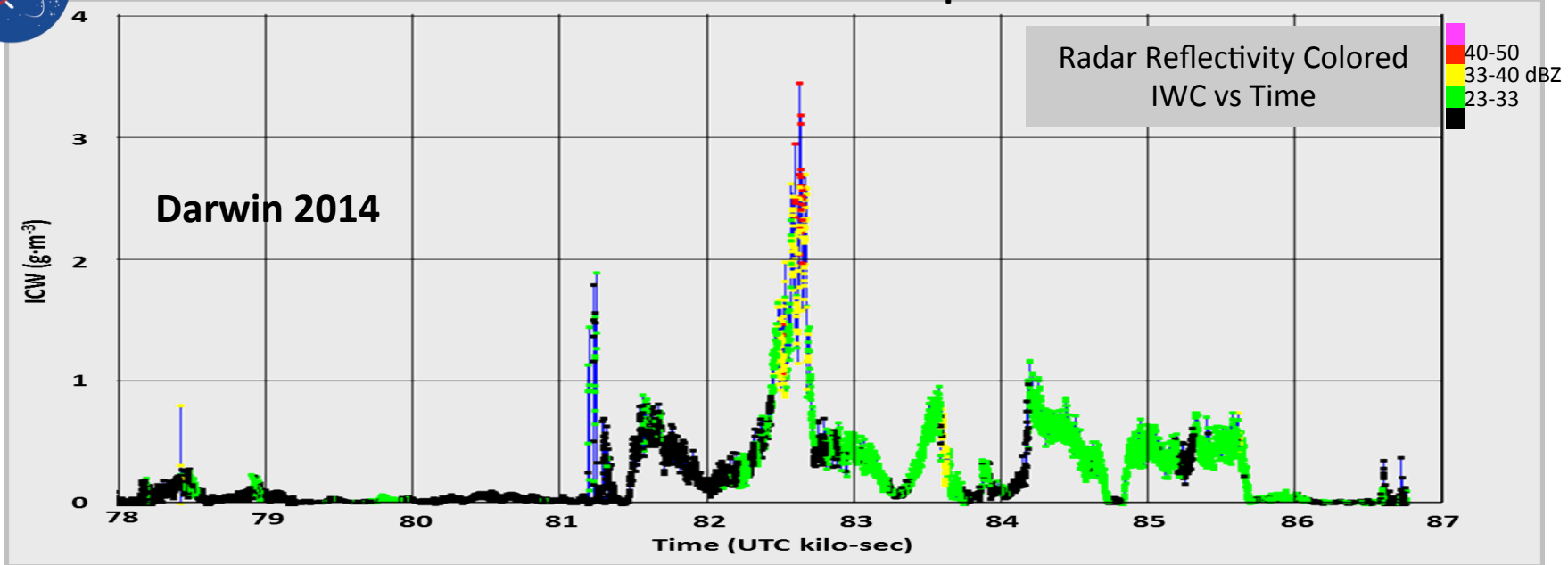
Cayenne 2015

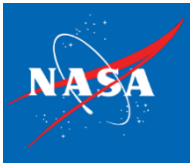


We have just begun (last week) to compare Cayenne Results to Darwin
- noted some differences but similarities are the dominant observation!



RRF v IWC Relationship?





Future Work

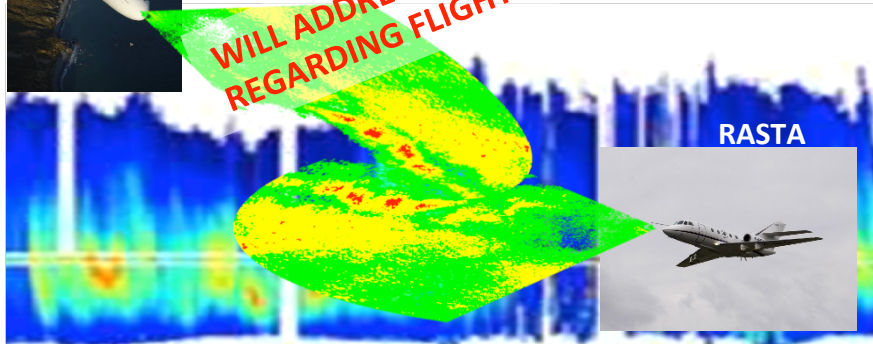
Radar Reflectivity Comparison

- Compare different radar data observations of the same HAIC event
- $Z_{F20} \vee Z_{757} \vee Z_{RASTA}$
- Spatial and temporal correlation
- Post process Recorded I&Q data
- Compute reflectivity + other signature

info
RDR 4000



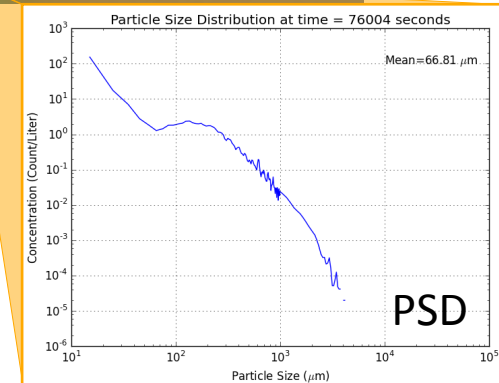
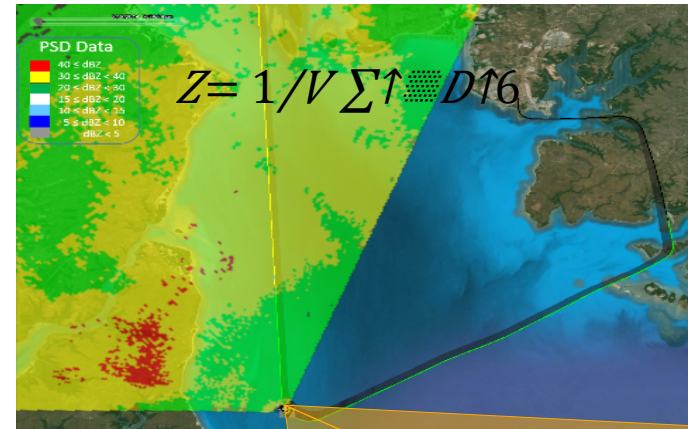
WILL ADDRESS CALIBRATION QUESTIONS REGARDING FLIGHT IN RED REFLECTIVITY



Primus-660

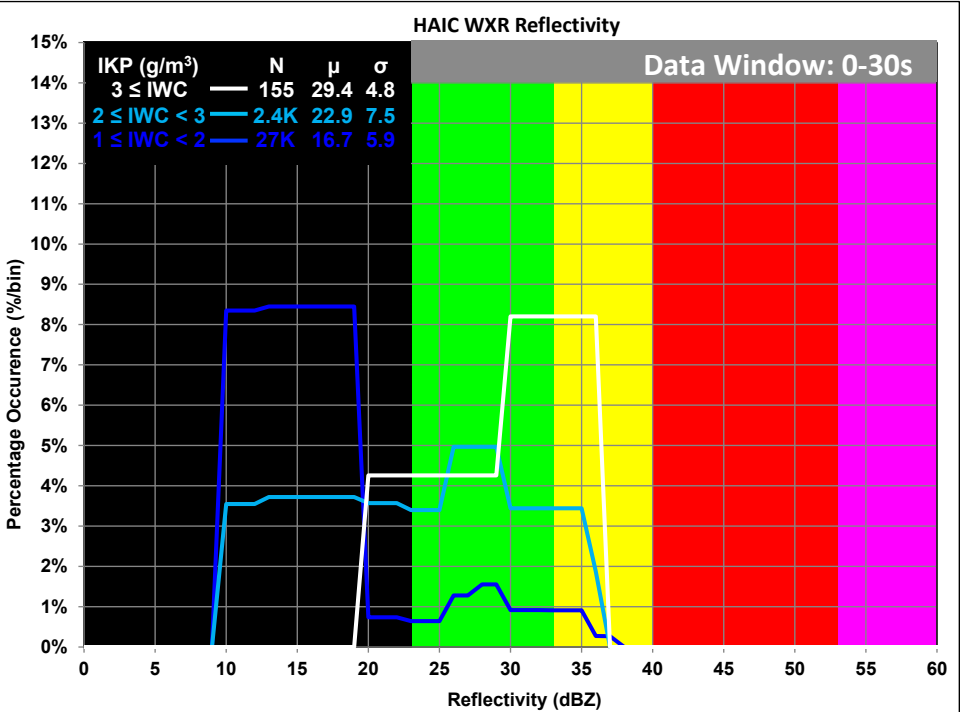
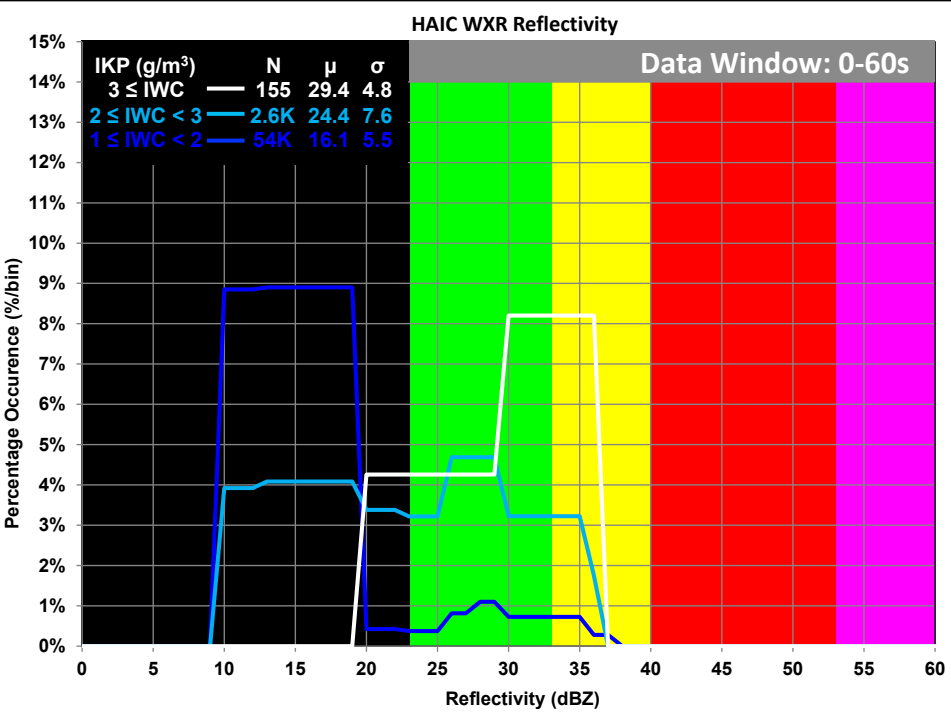
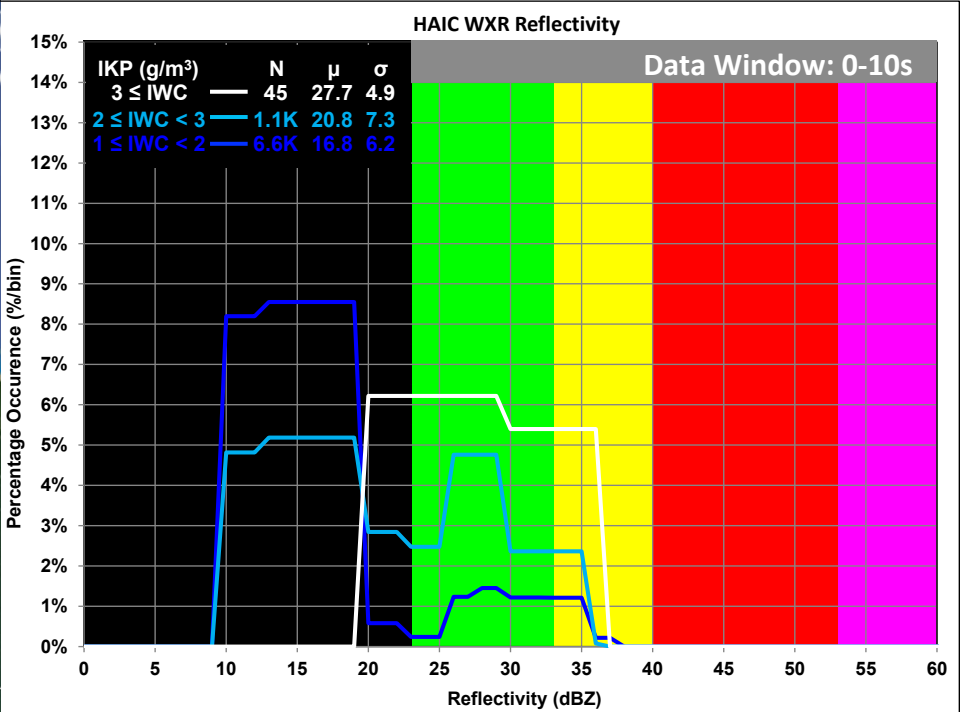
Radar Comparison to Particle Data

- Compute theoretical radar reflectivity from particle size distributions
- $Z_X \vee Z_W \vee Z_{PSD}$
- Correlate with radar measurements

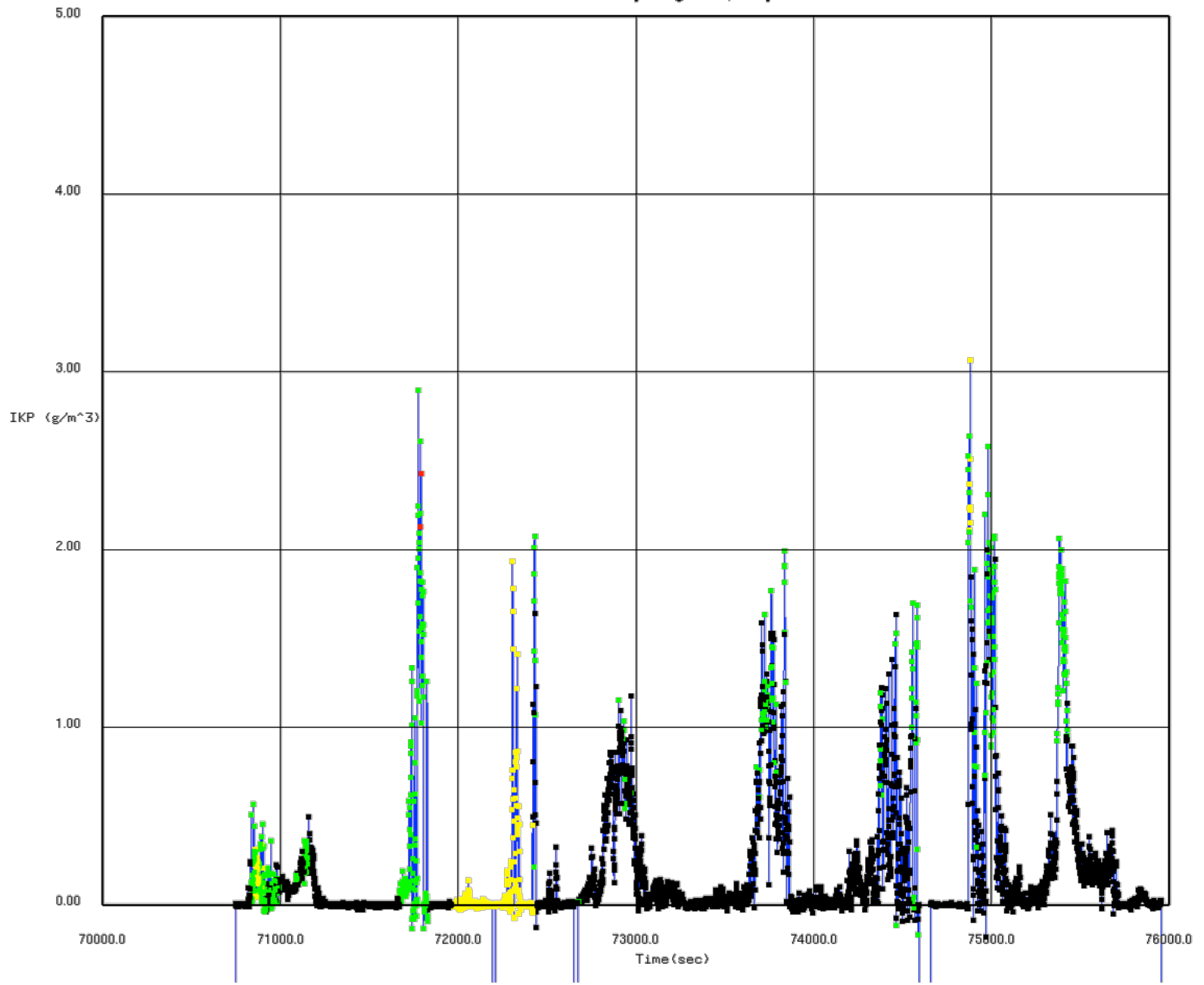


**2015 HAIC FLIGHT CAMPAIGN (CAYENNE, FRENCH GUIANA)
PRELIMINARY RESULTS**

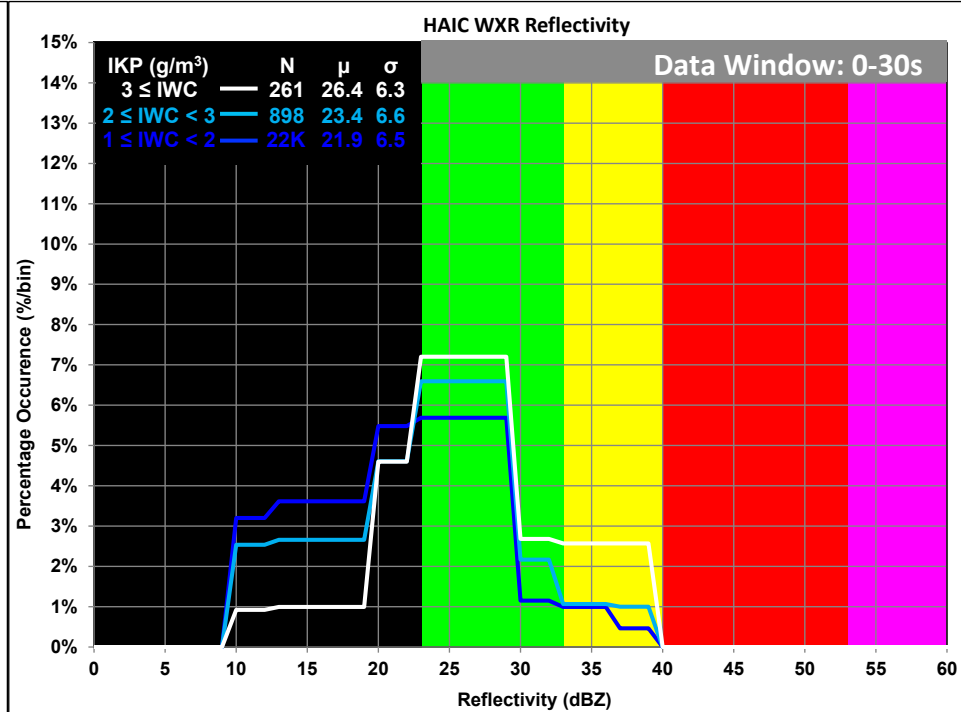
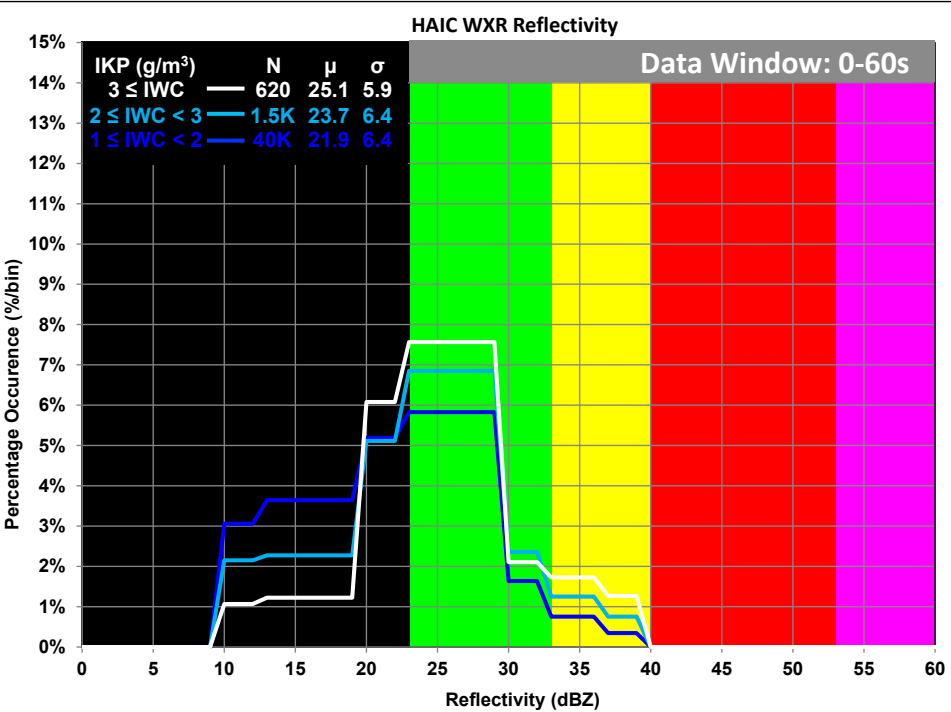
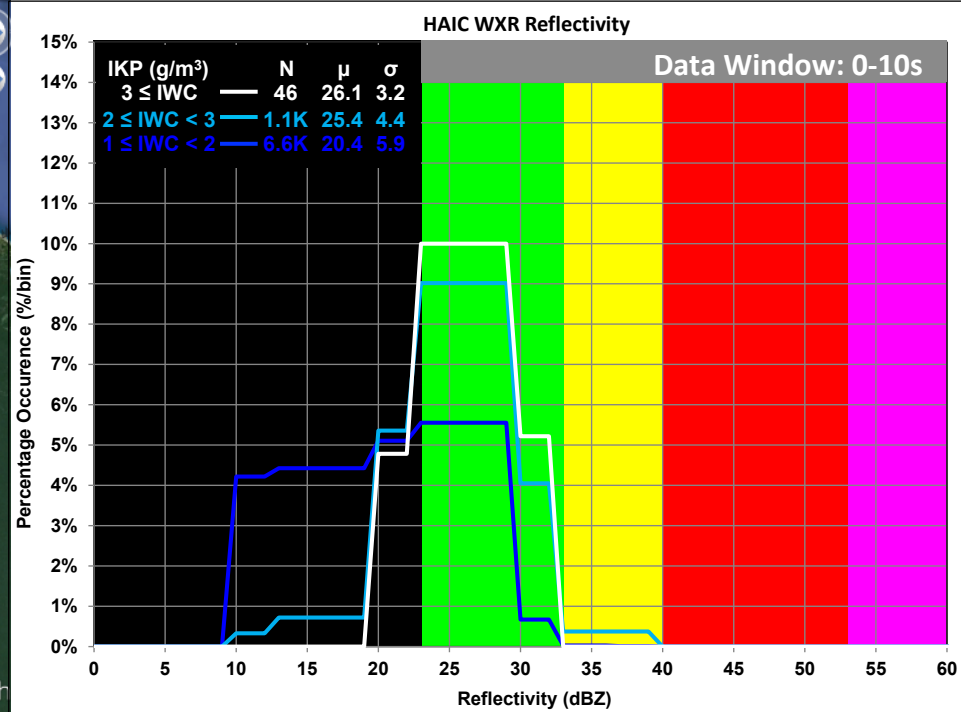
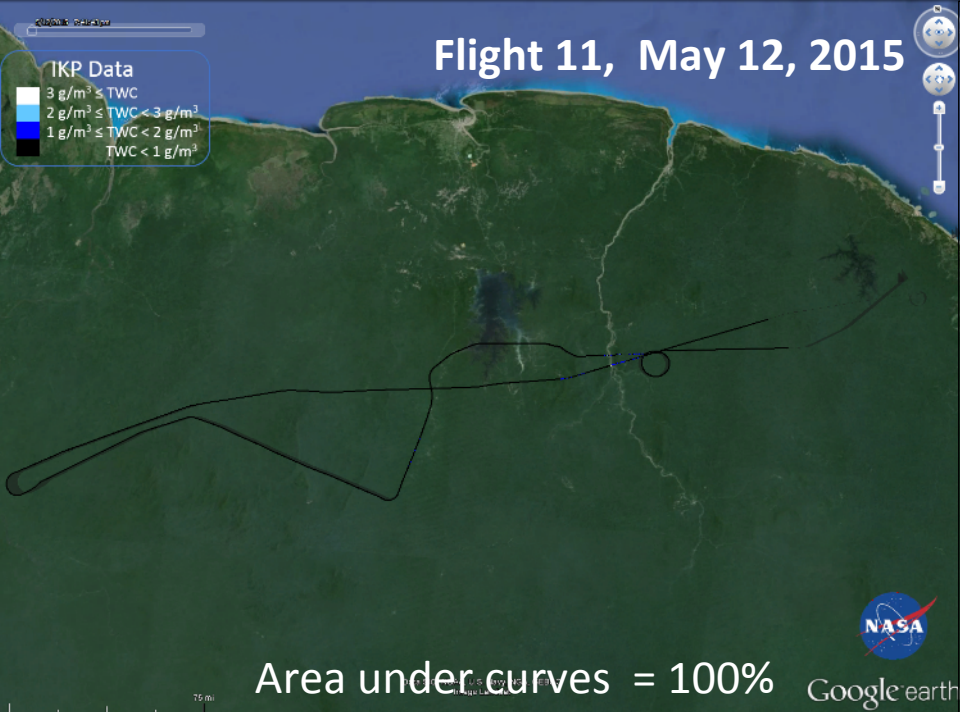
**DAILY RADAR REFLECTIVITY
HISTOGRAMS/STATS
&
RRF COLORED IKP MEASUREMENTS**



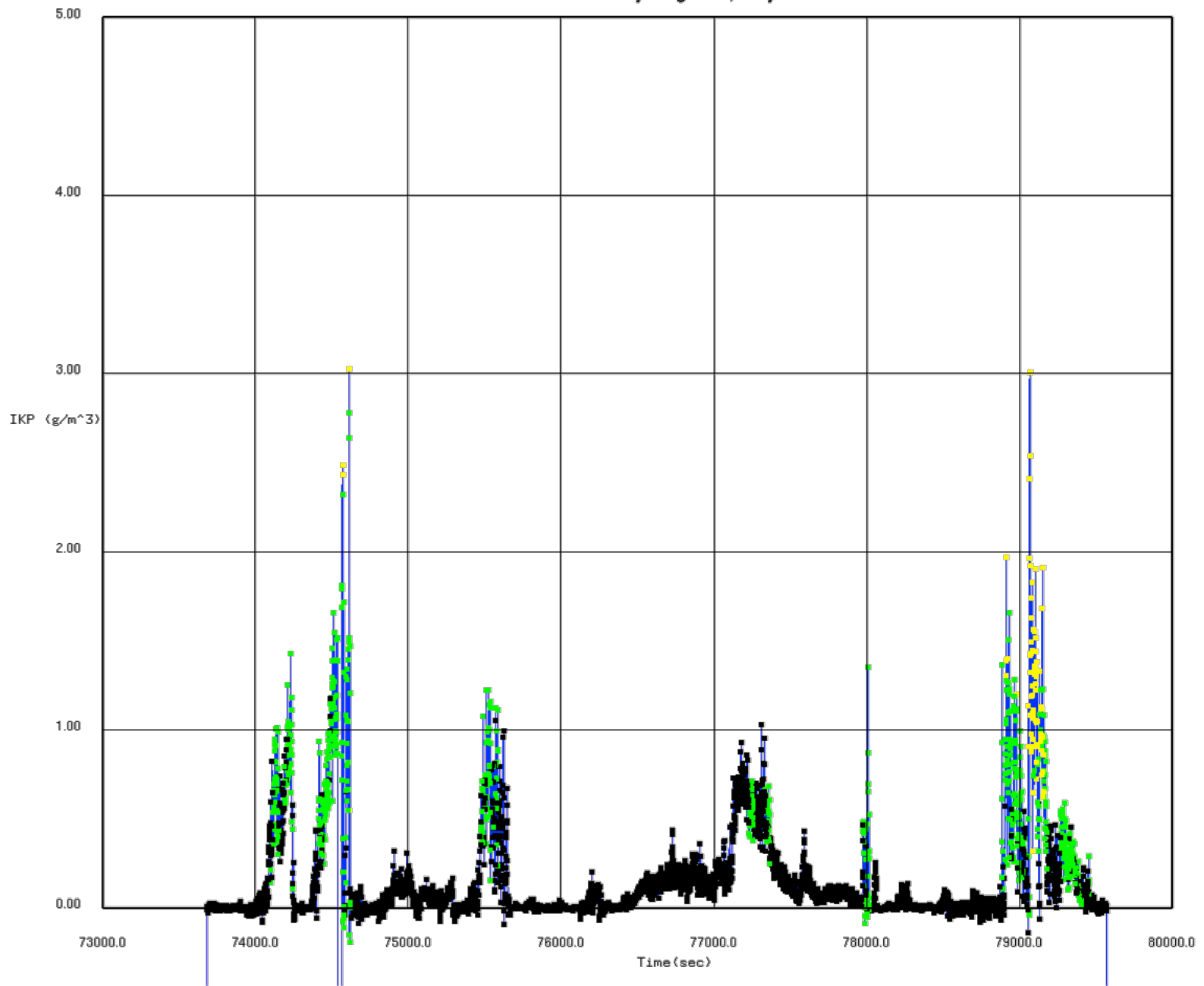
IKP and Reflectivity Flight 10, May 10

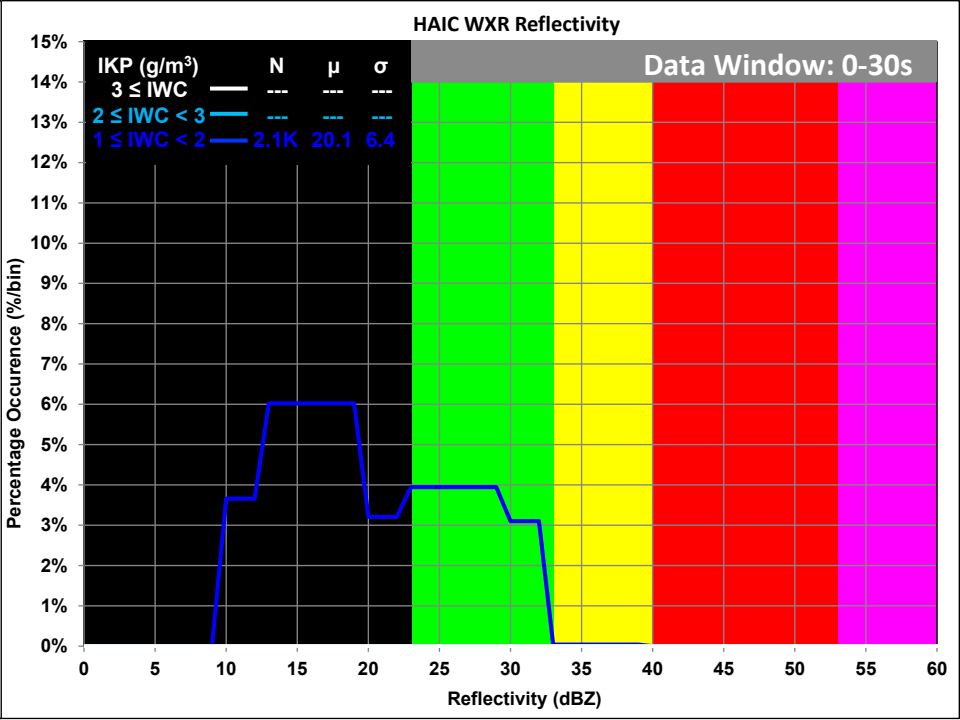
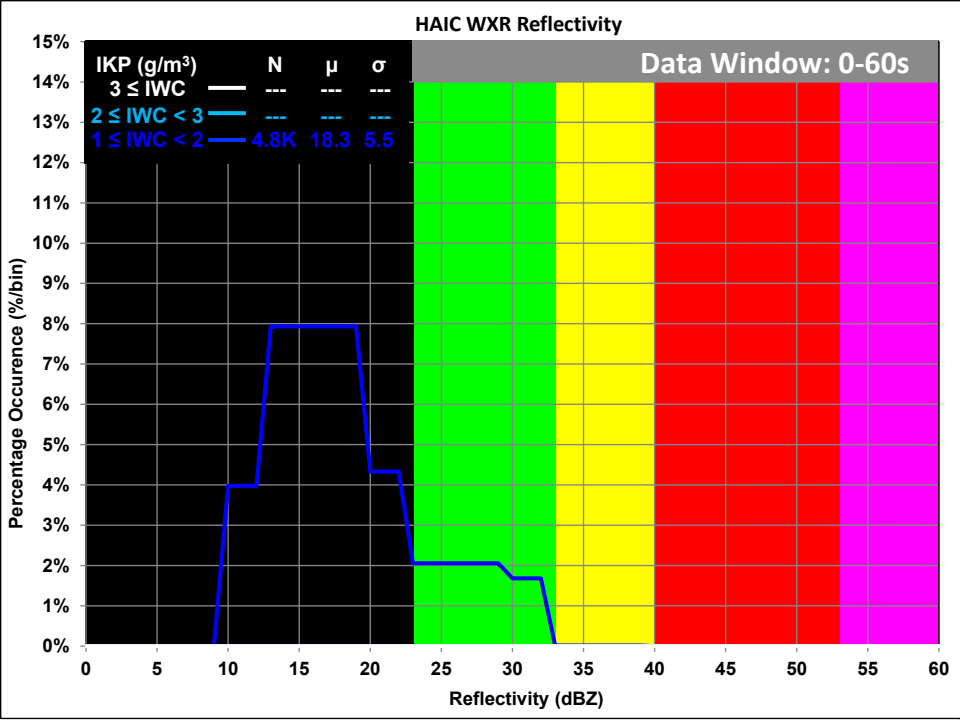
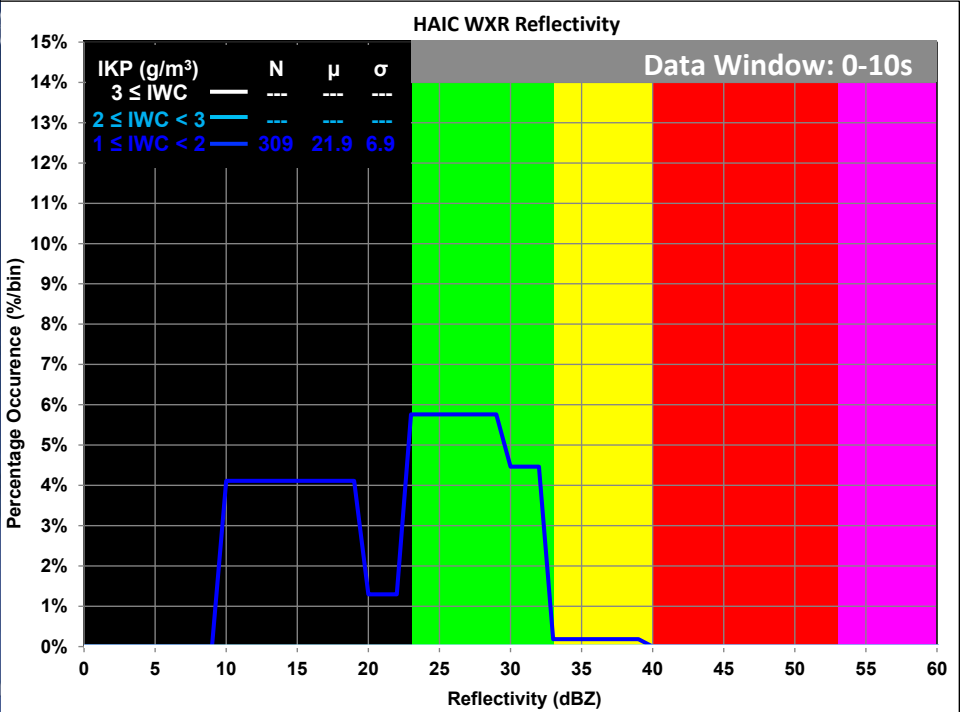
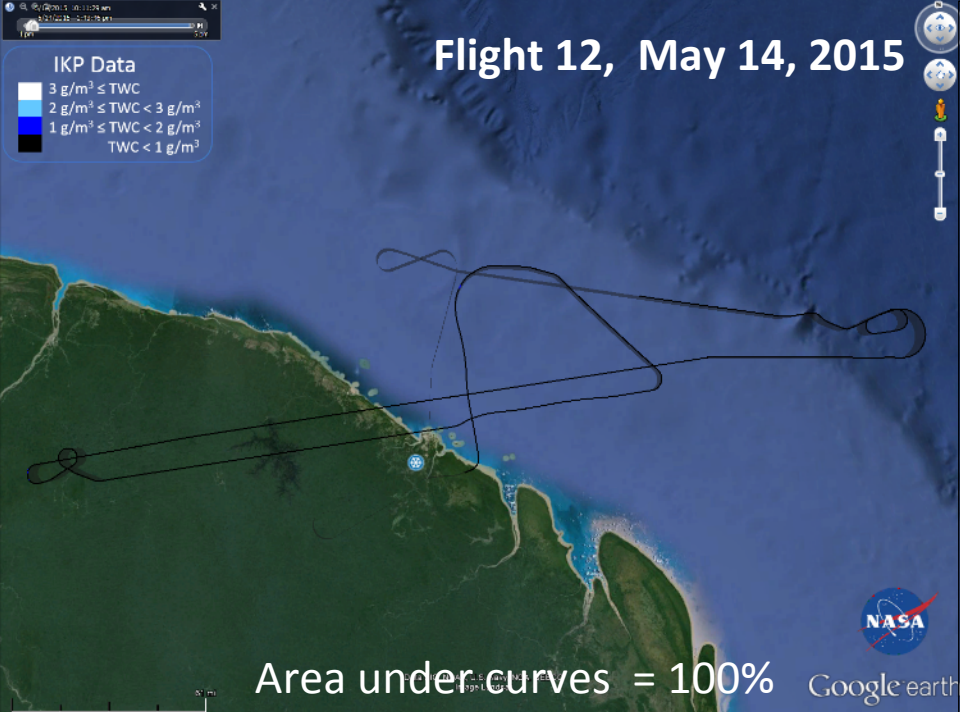


Flight 11, May 12, 2015

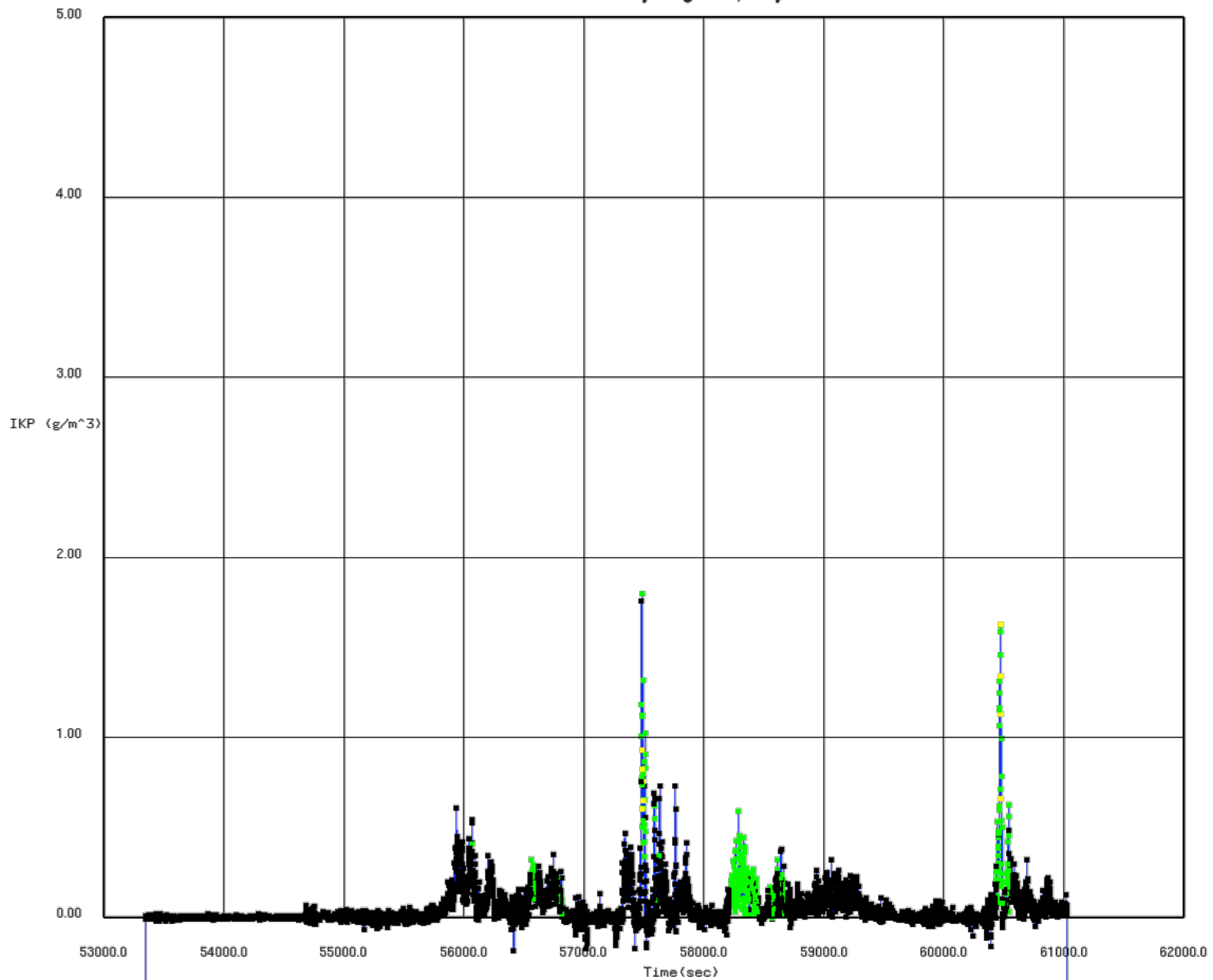


IKP and Reflectivity Flight 11, May 12

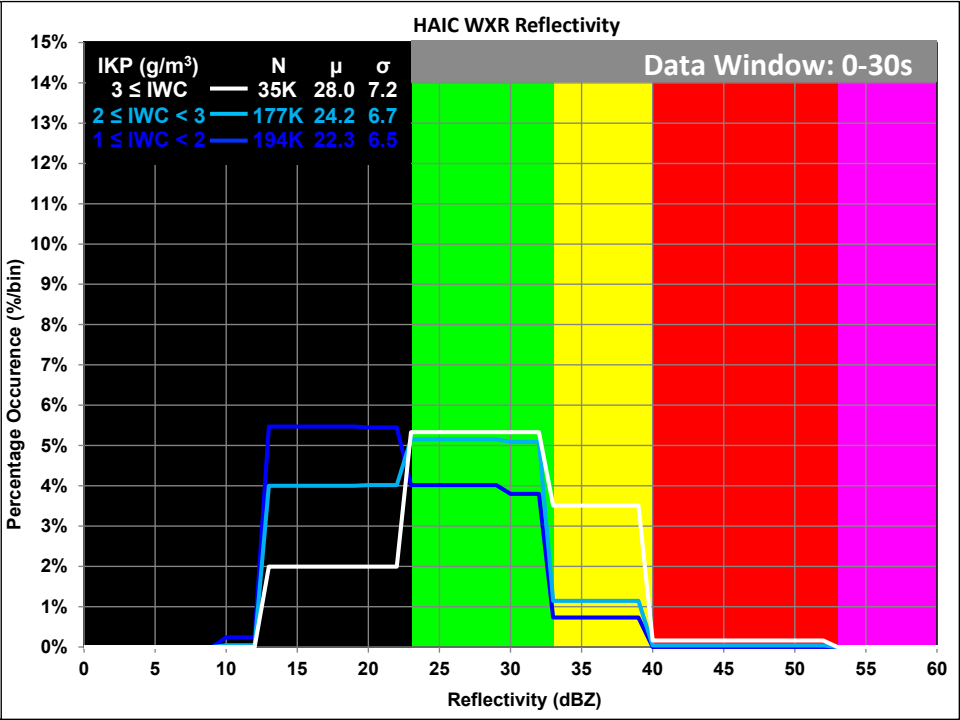
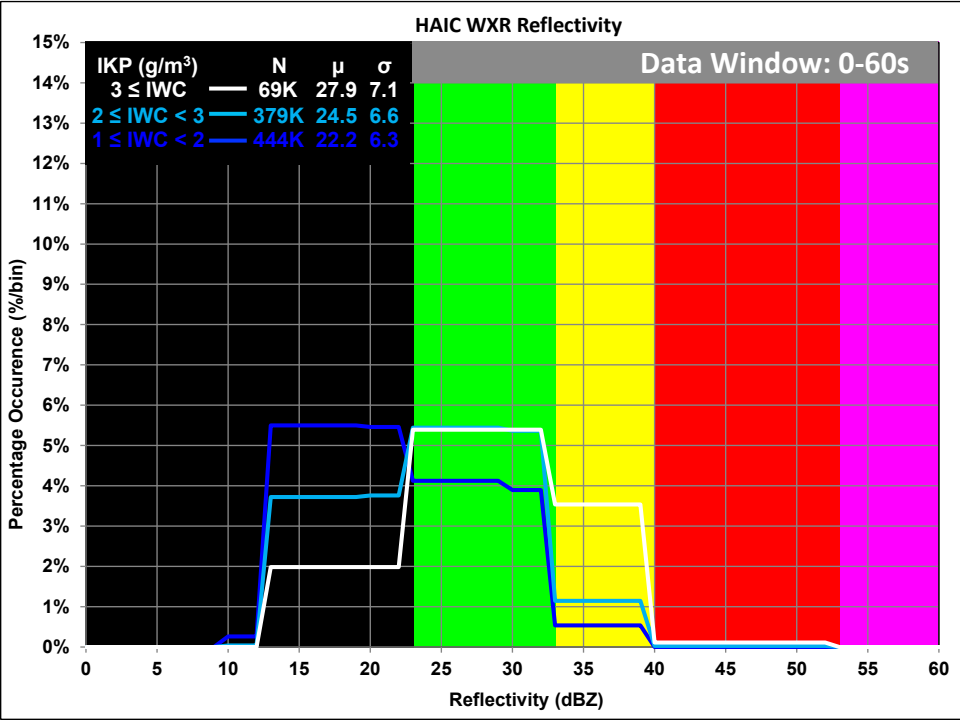
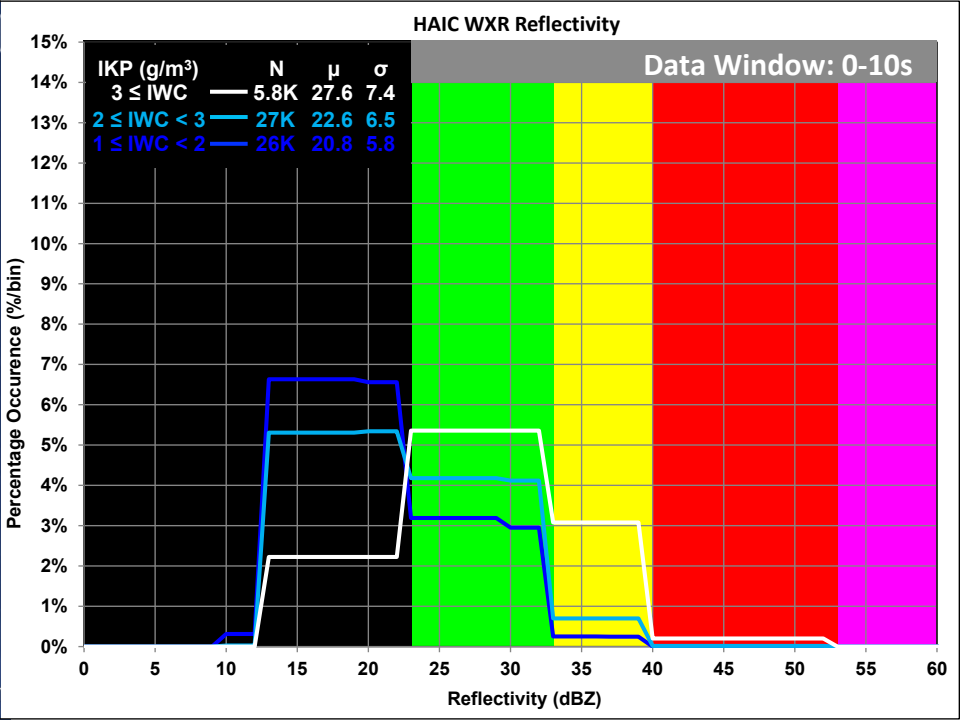
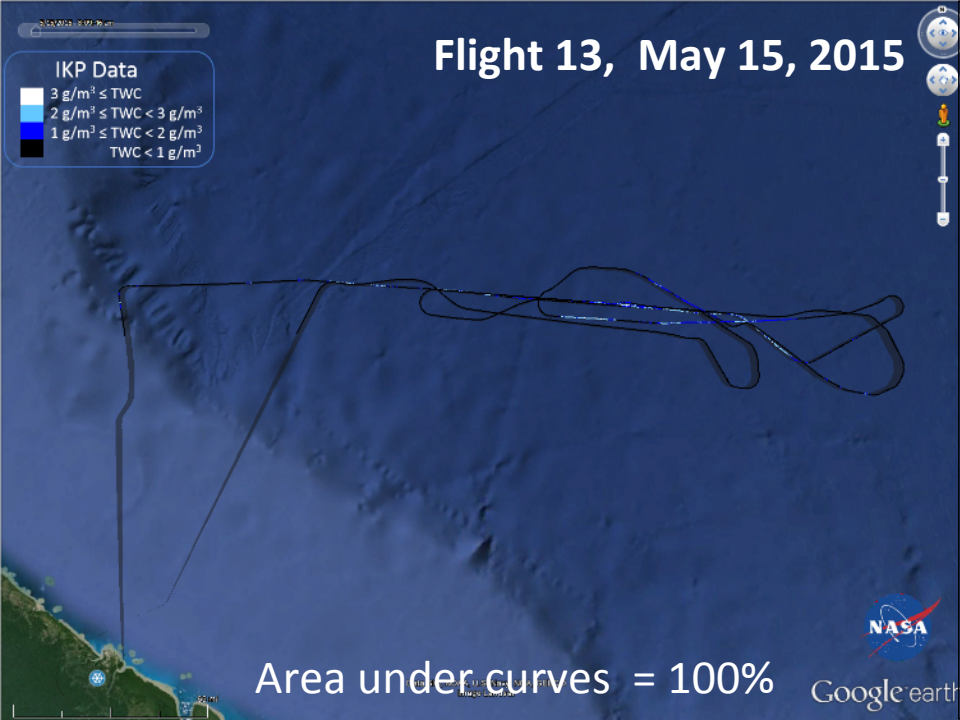




IKP and Reflectivity Flight 12, May 14

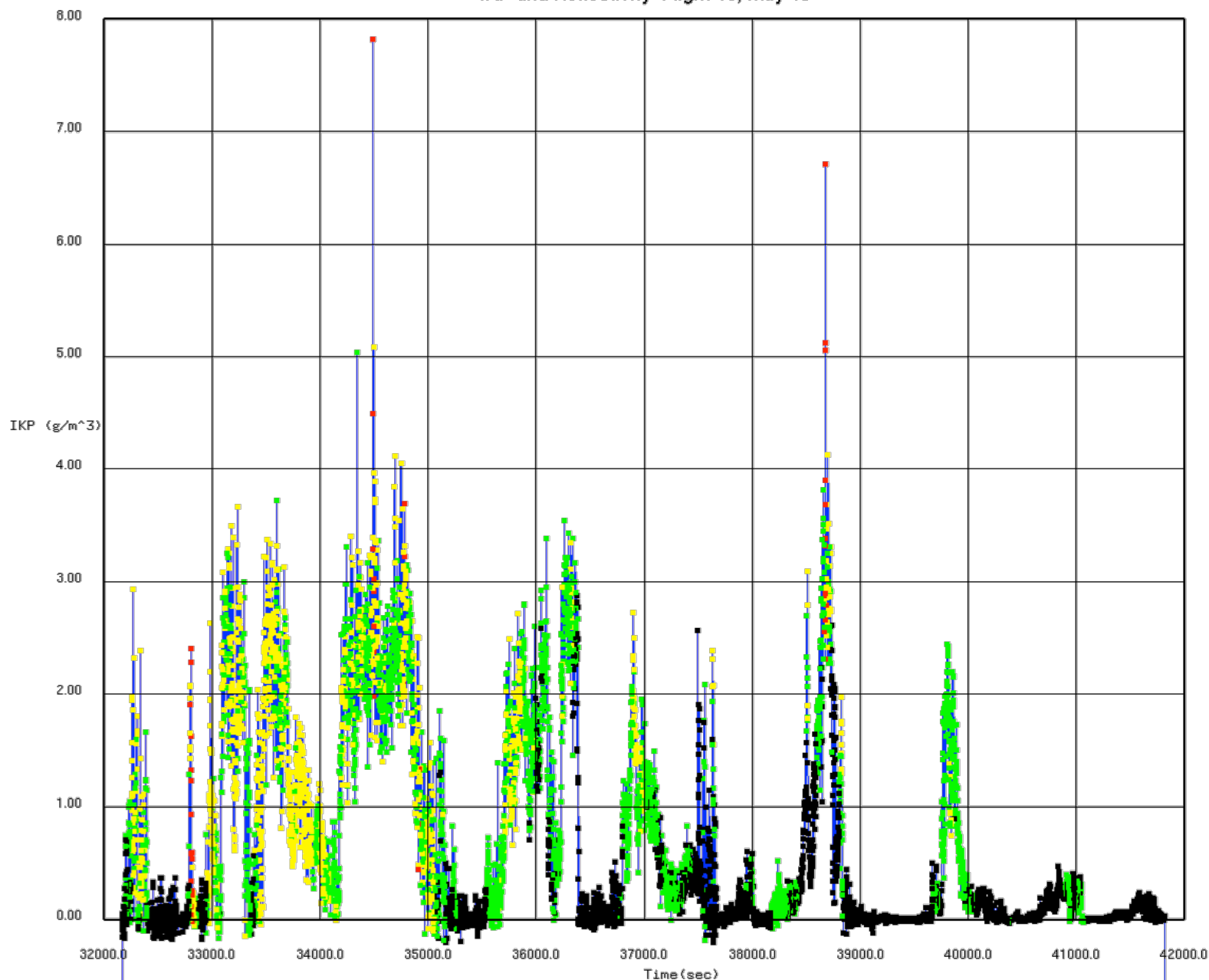


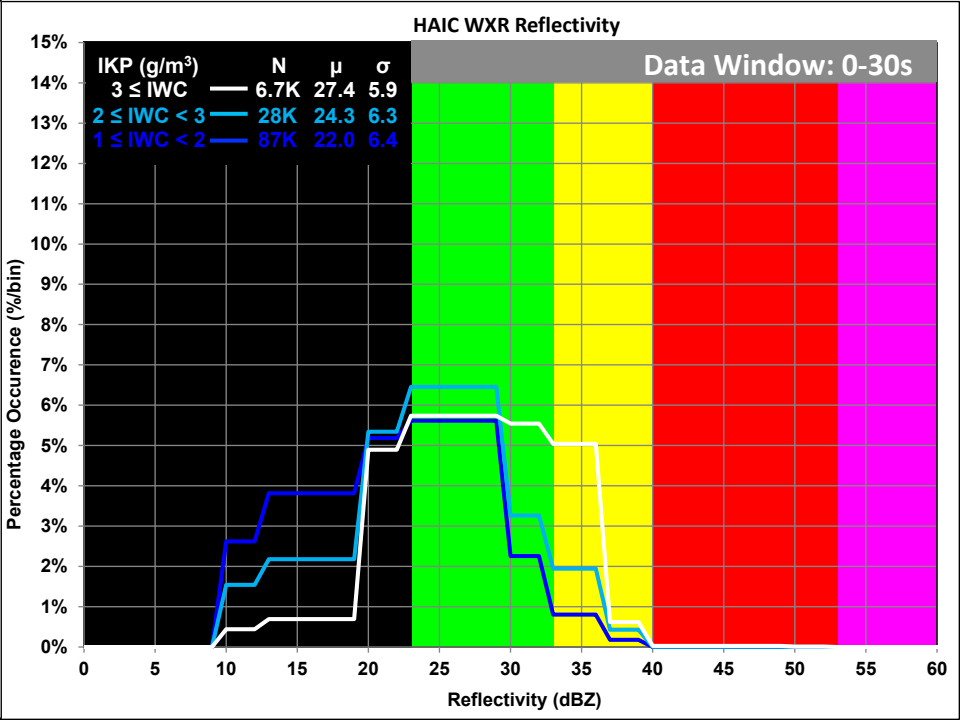
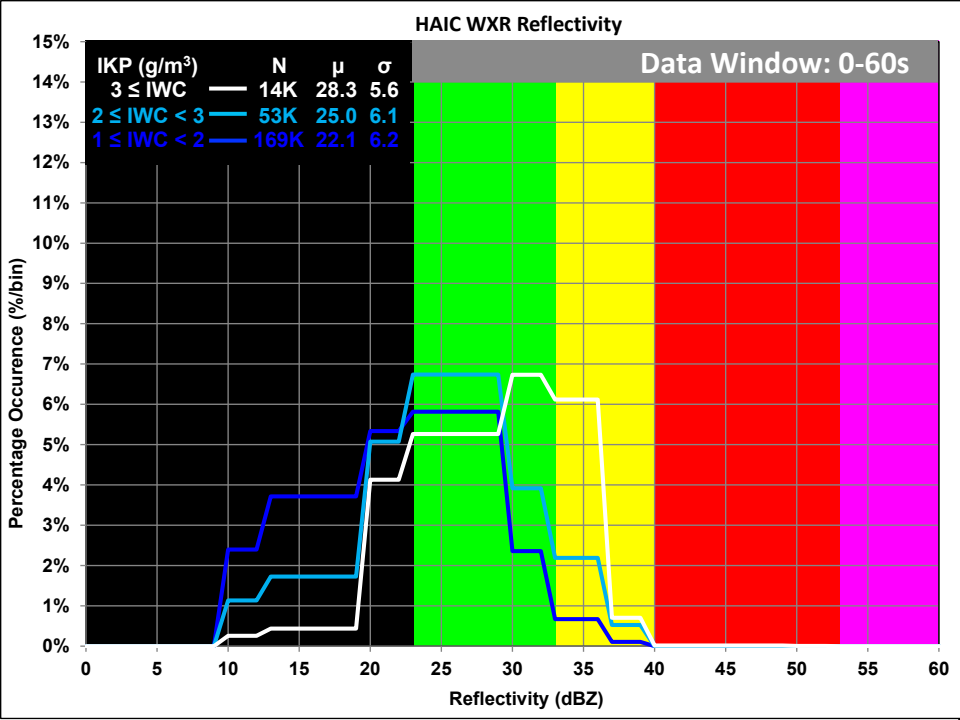
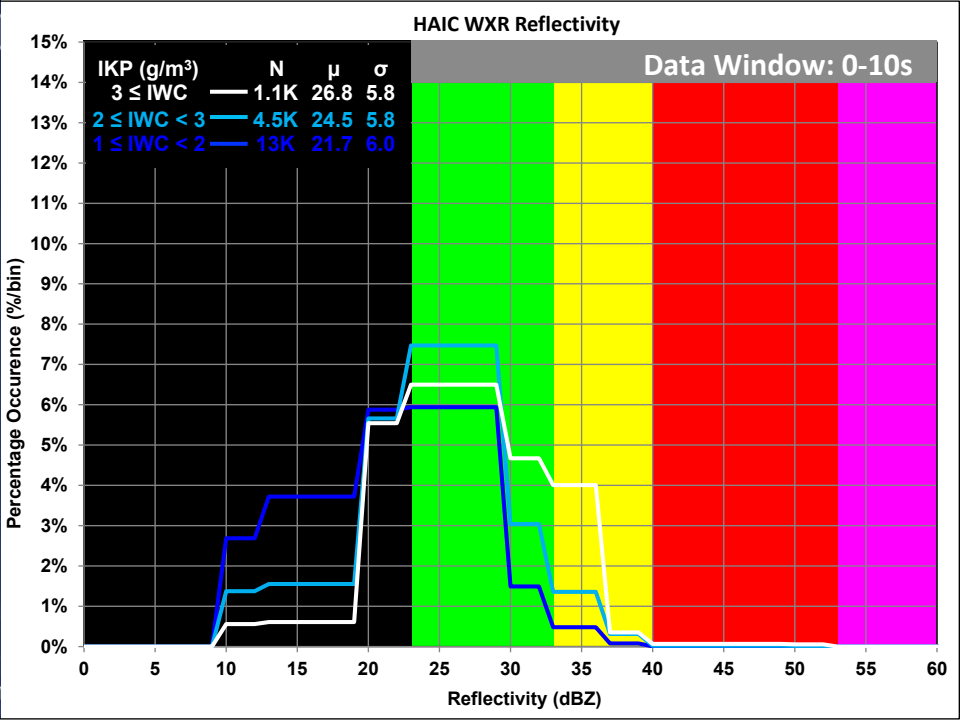
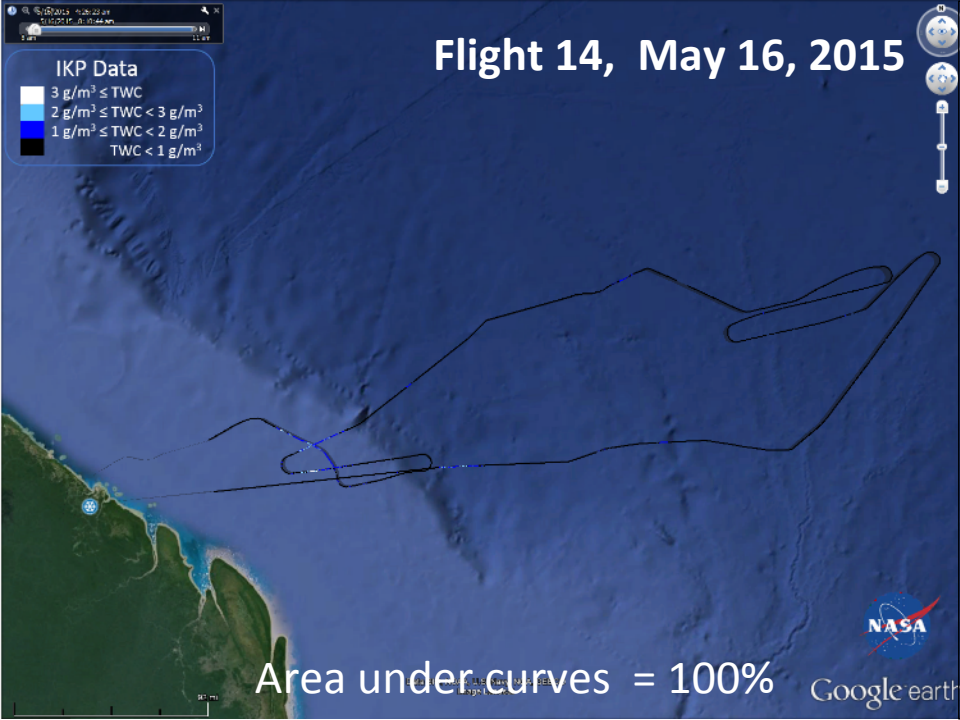
Flight 13, May 15, 2015



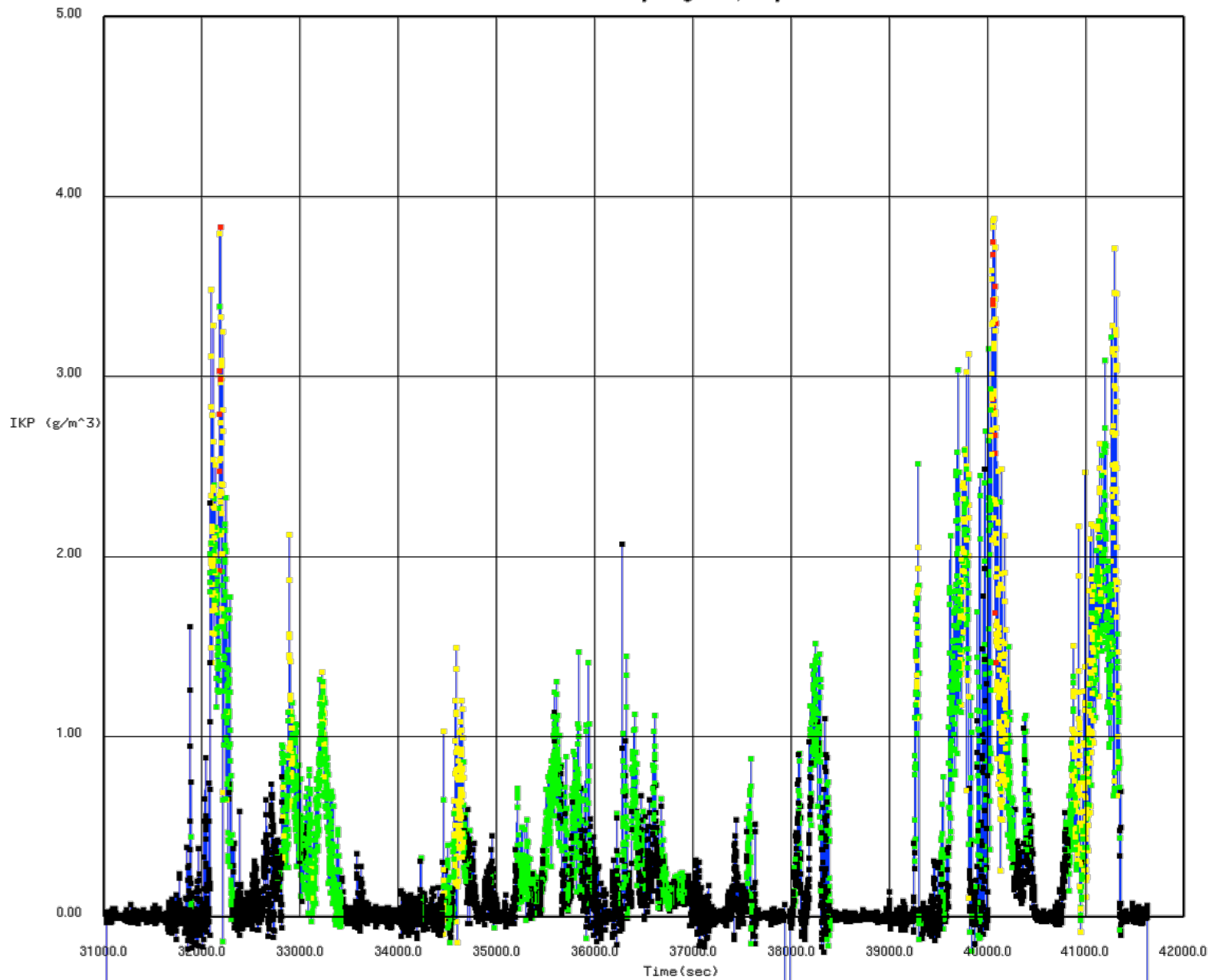
different Y-axis

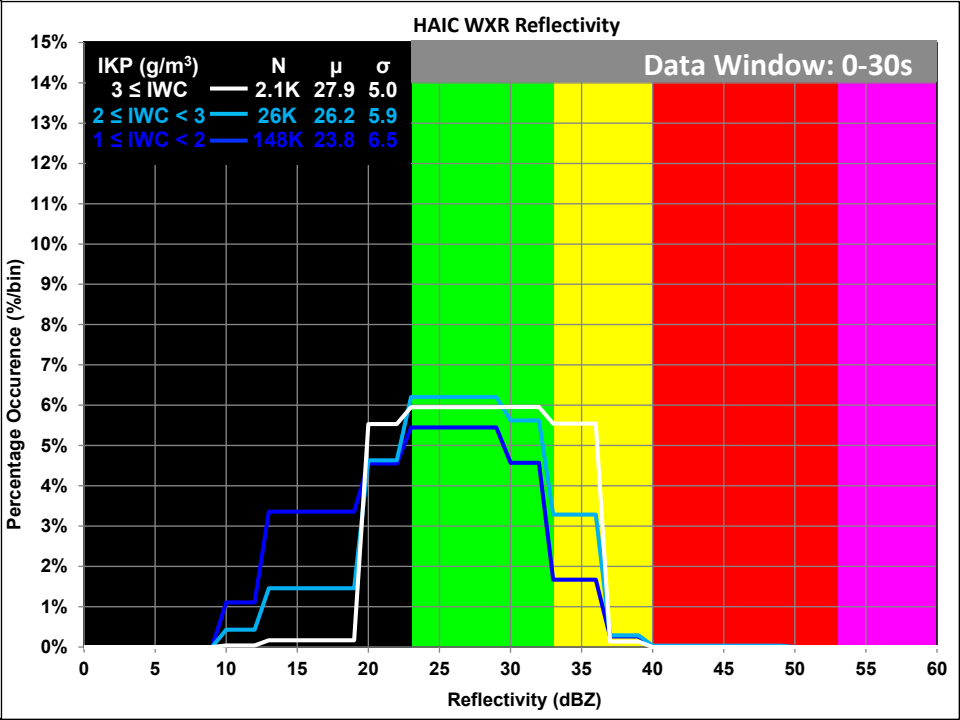
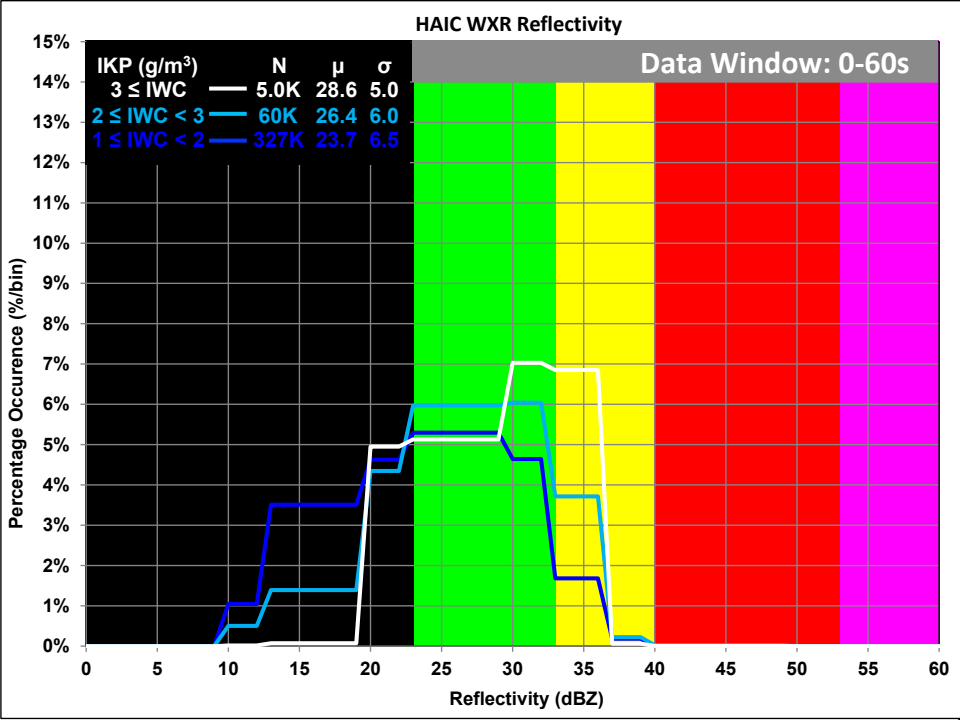
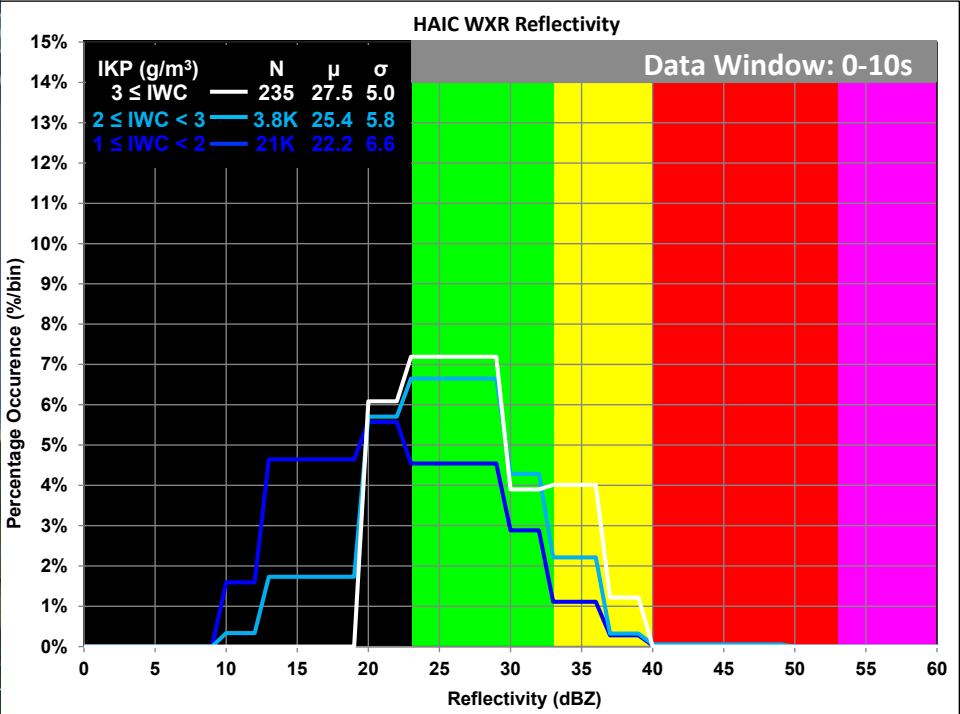
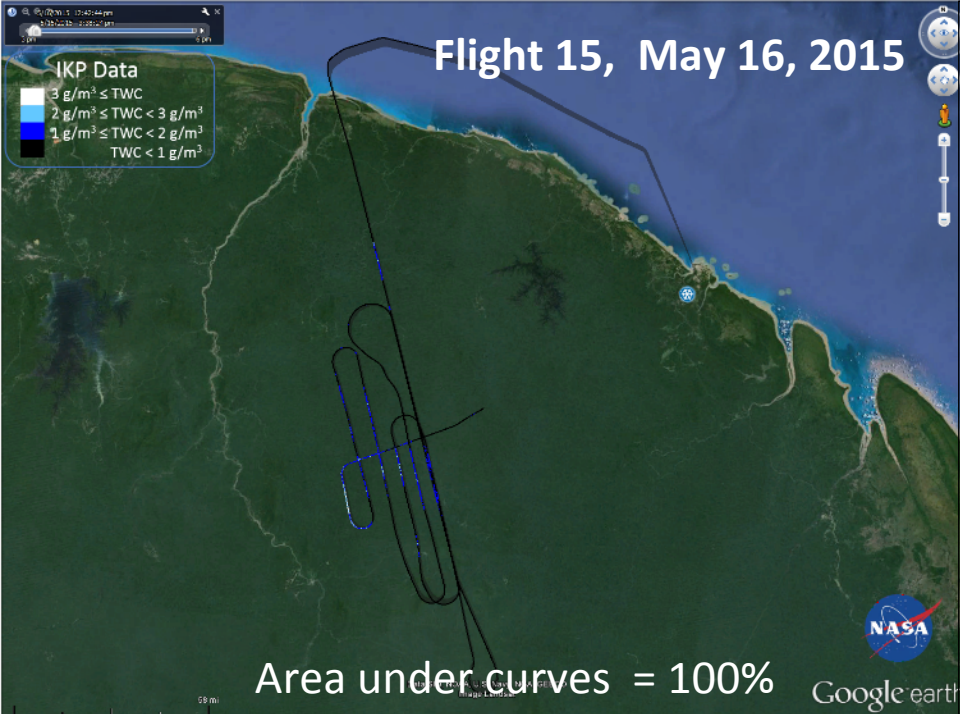
IKP and Reflectivity Flight 13, May 15



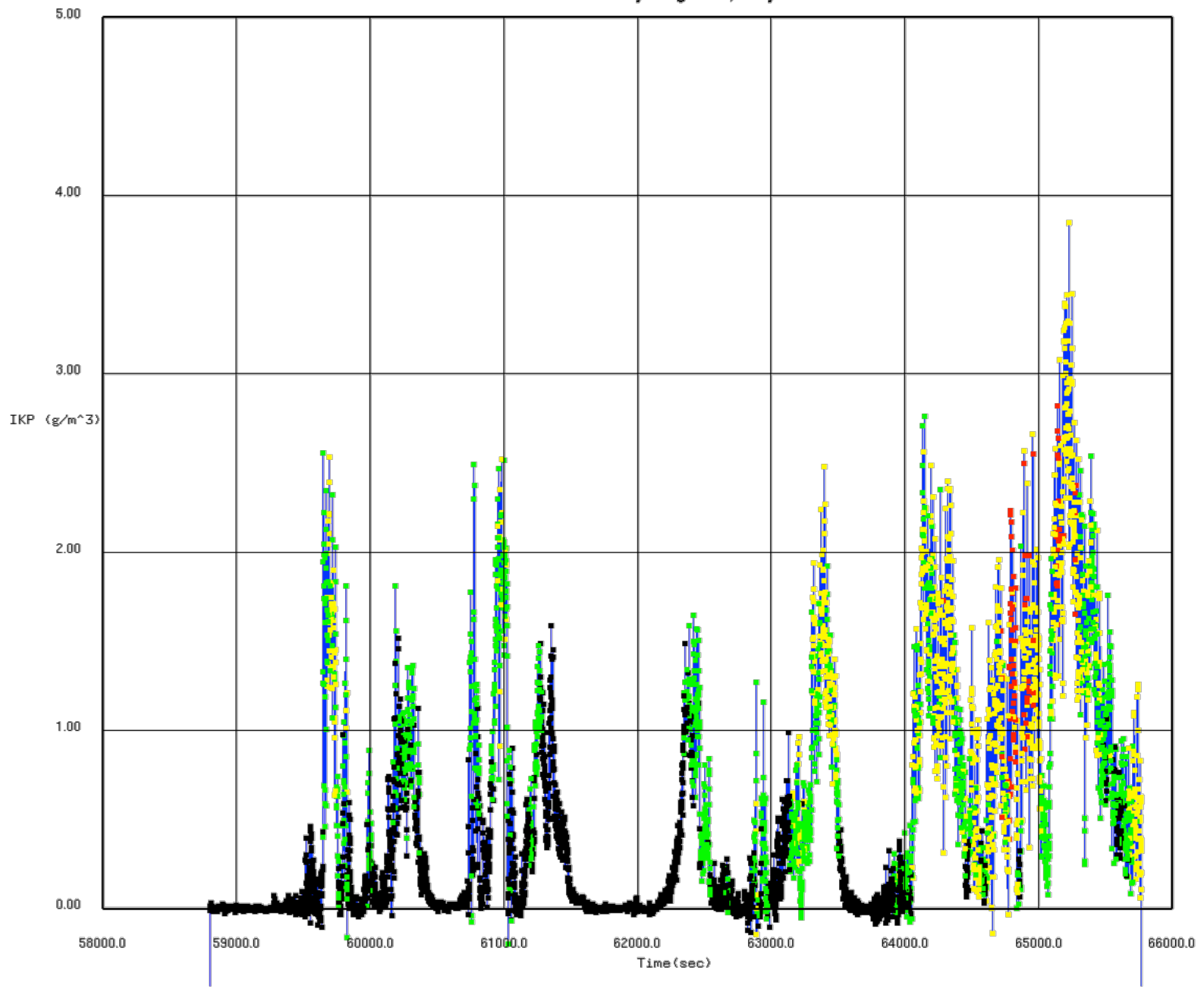


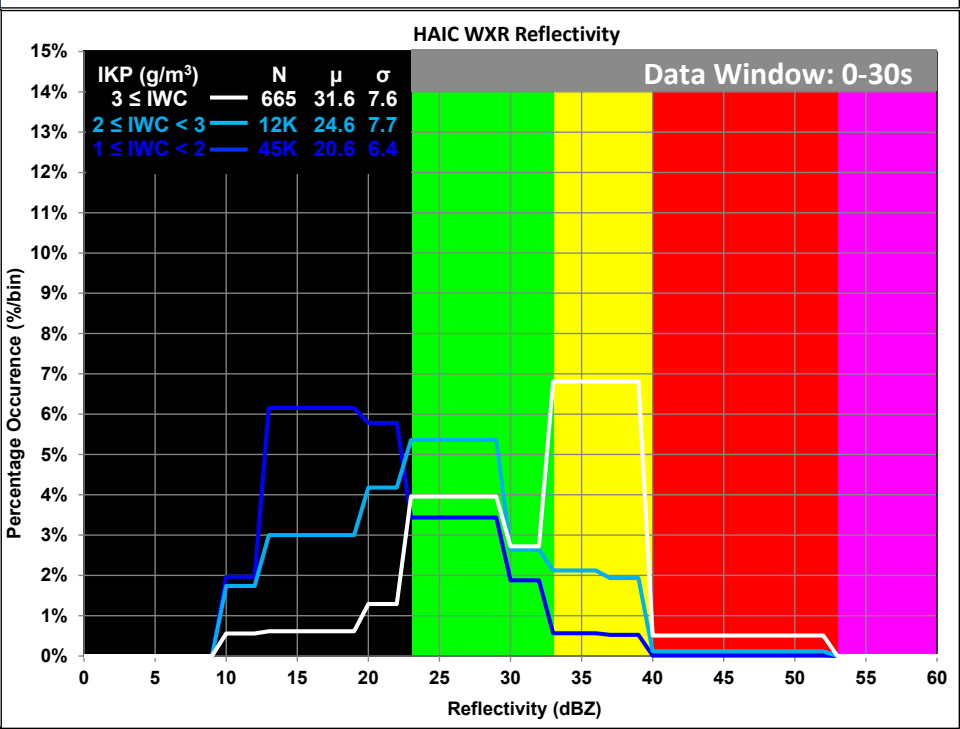
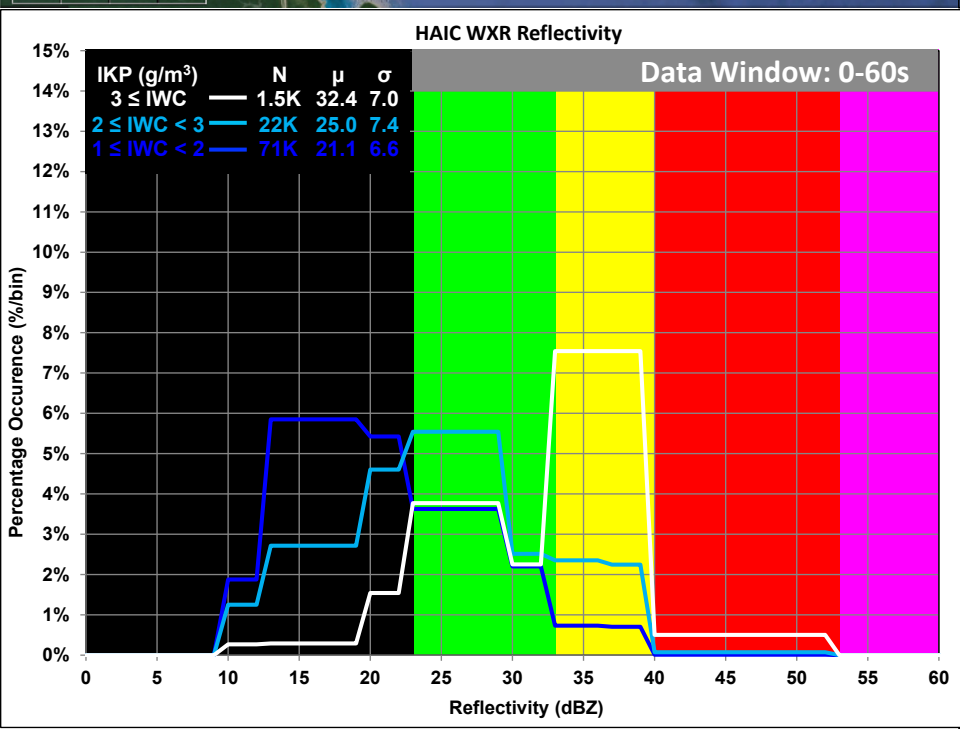
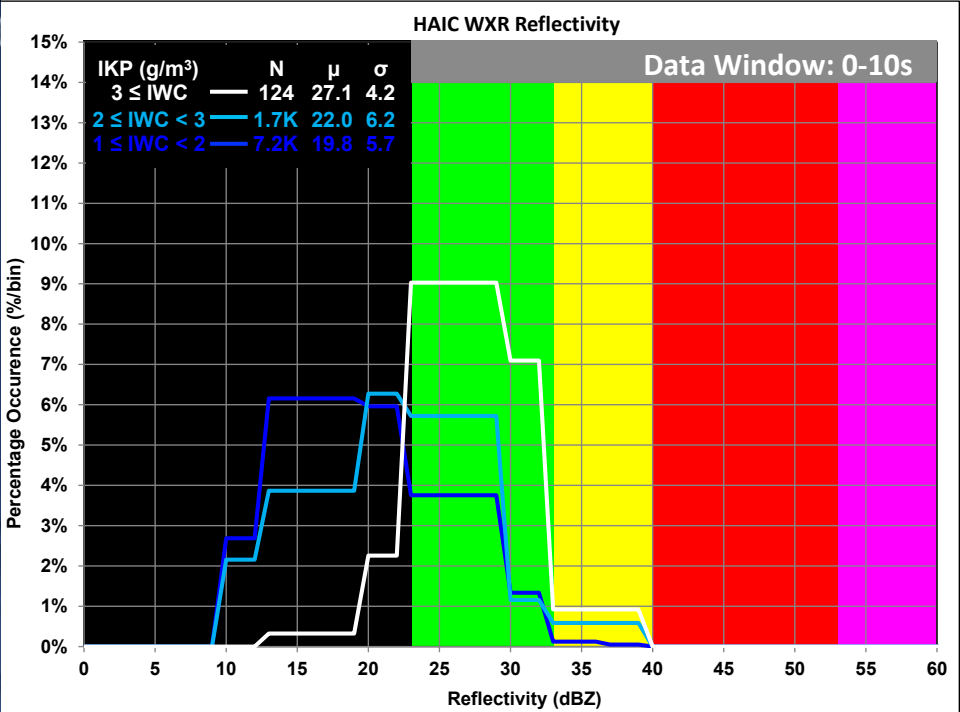
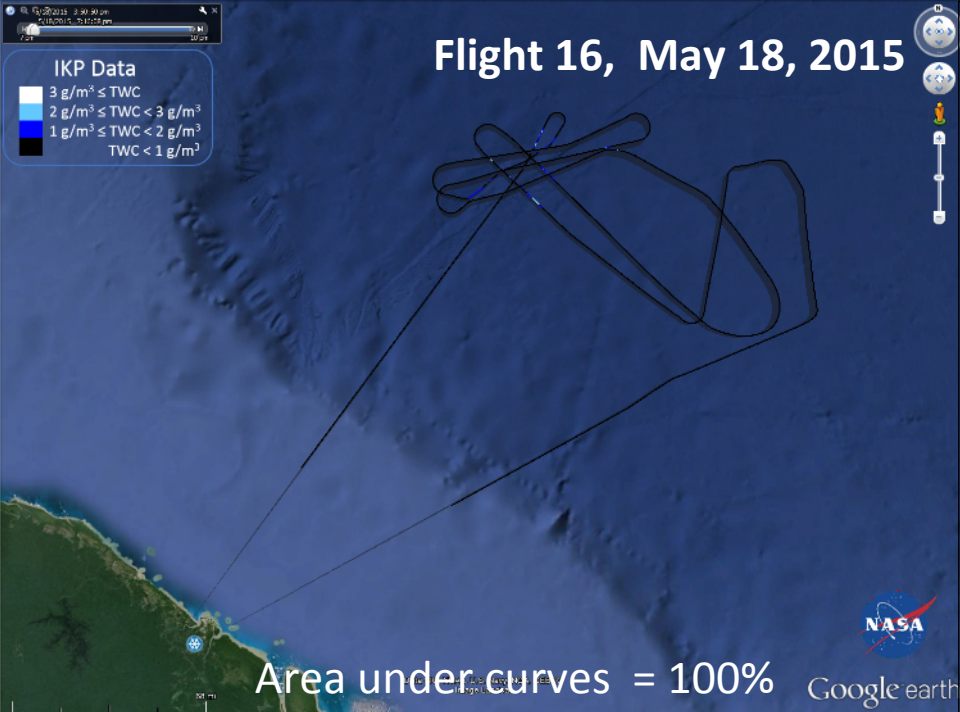
IKP and Reflectivity Flight 14, May 16



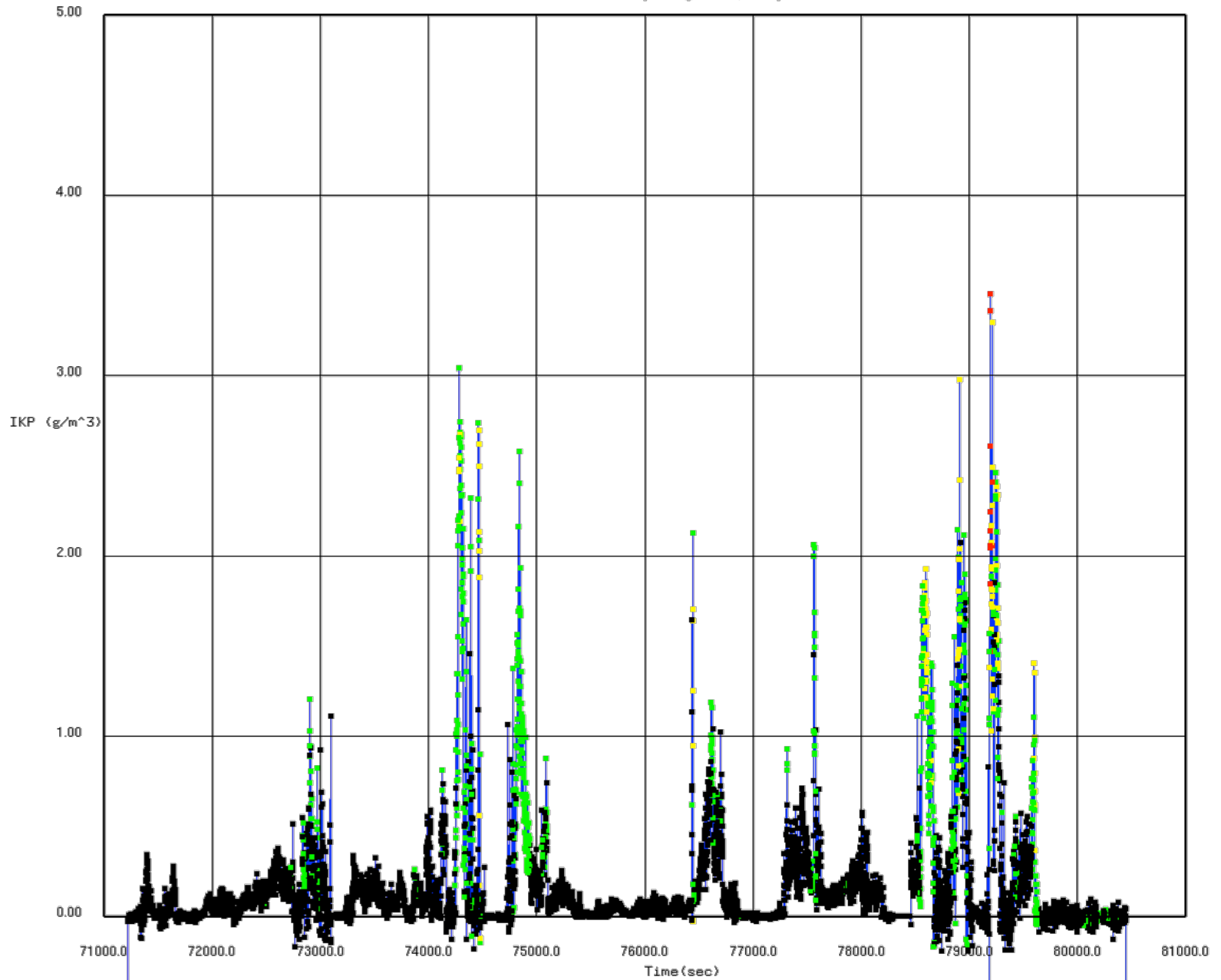


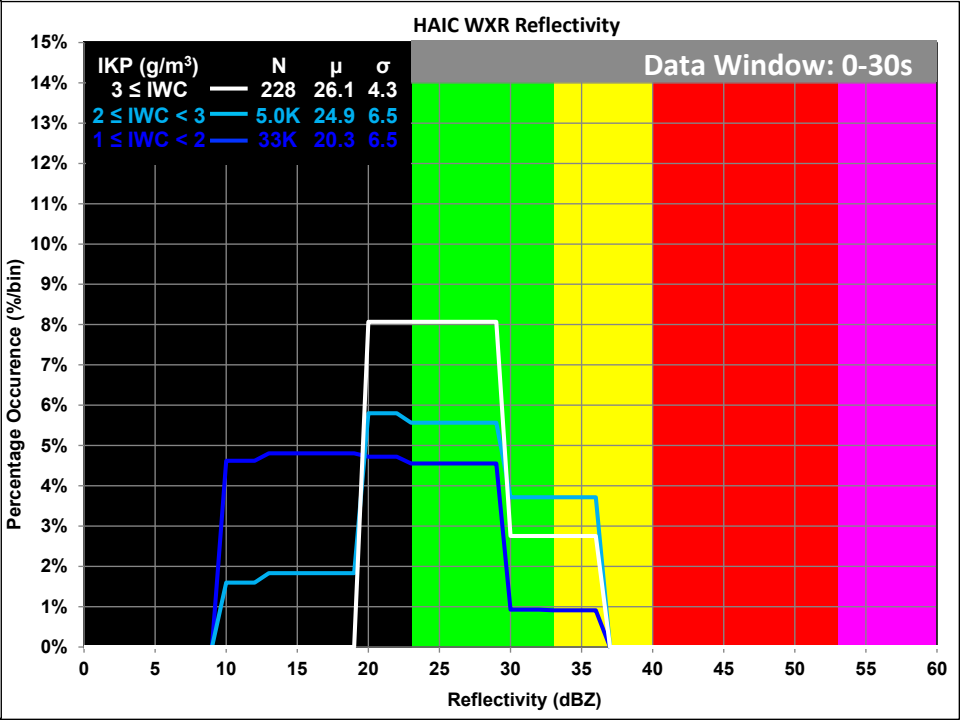
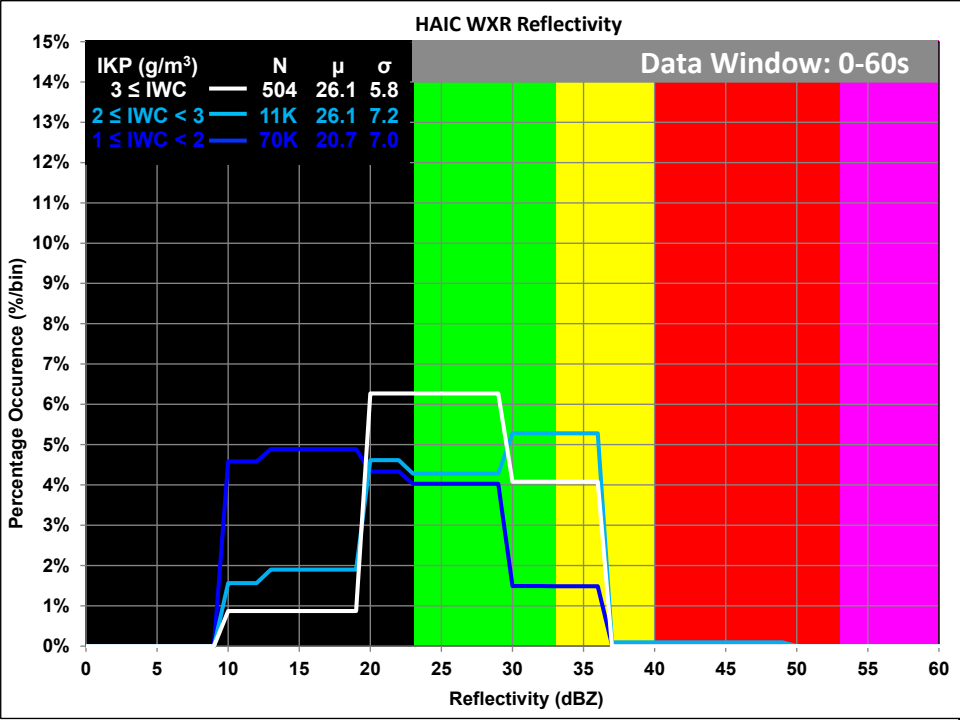
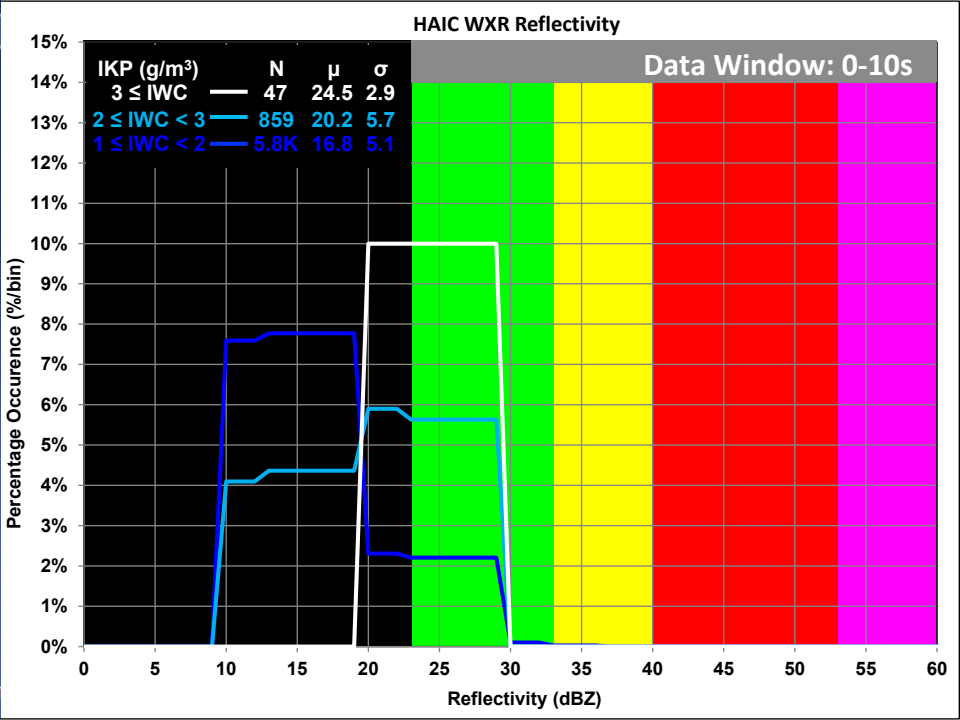
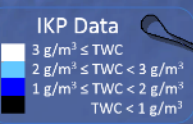
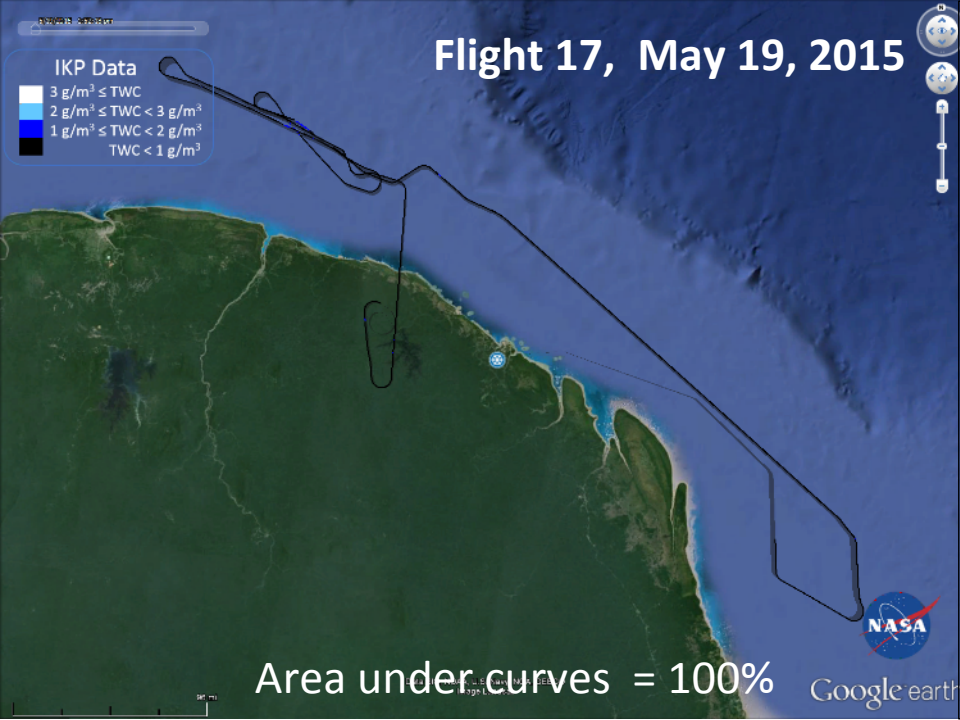
IKP and Reflectivity Flight 15, May 16



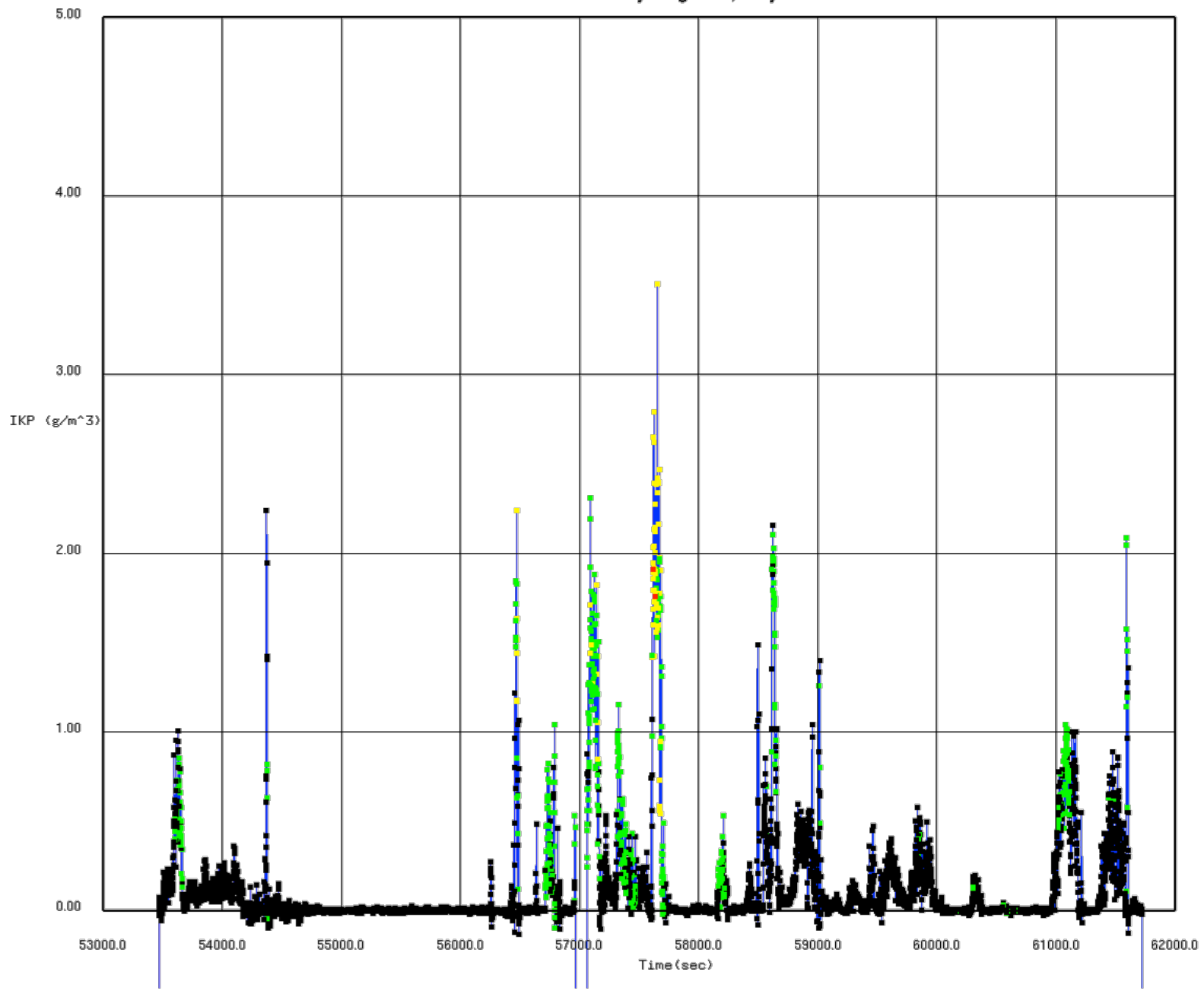


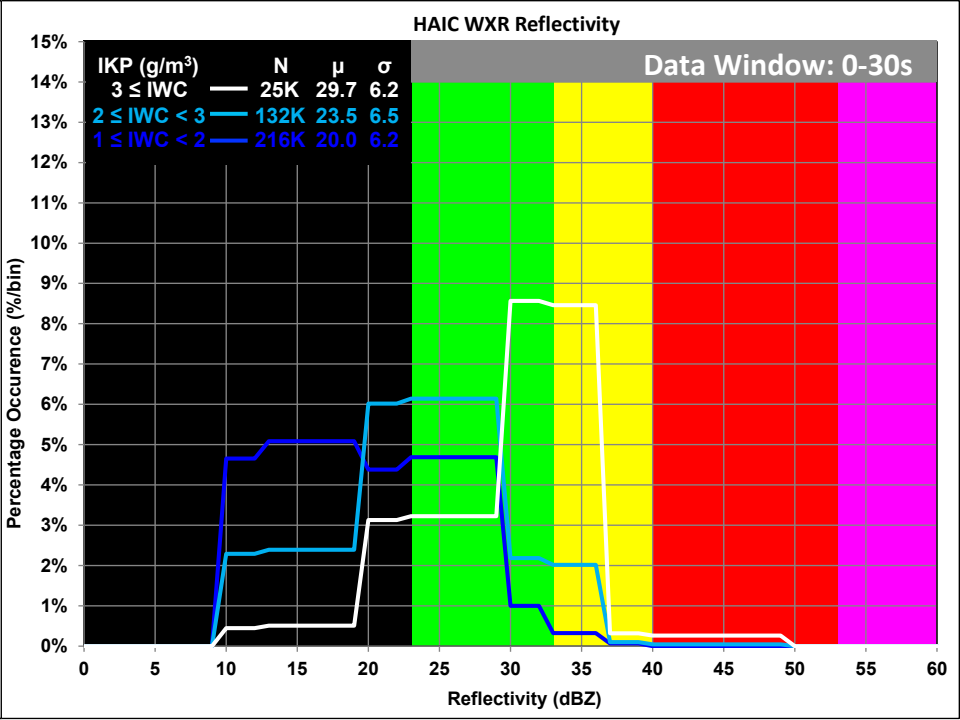
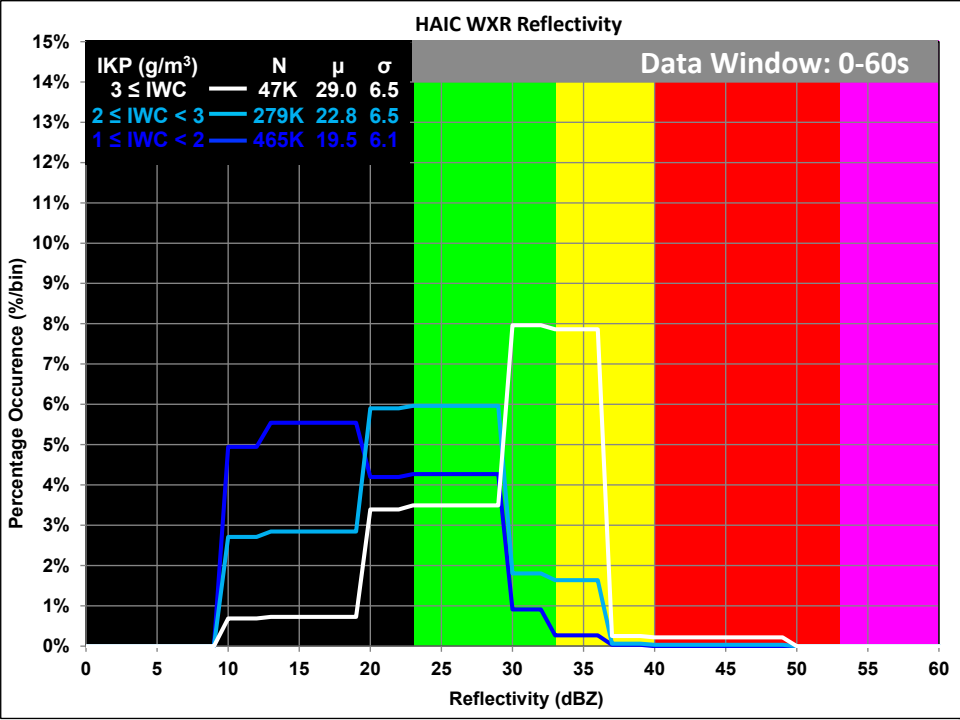
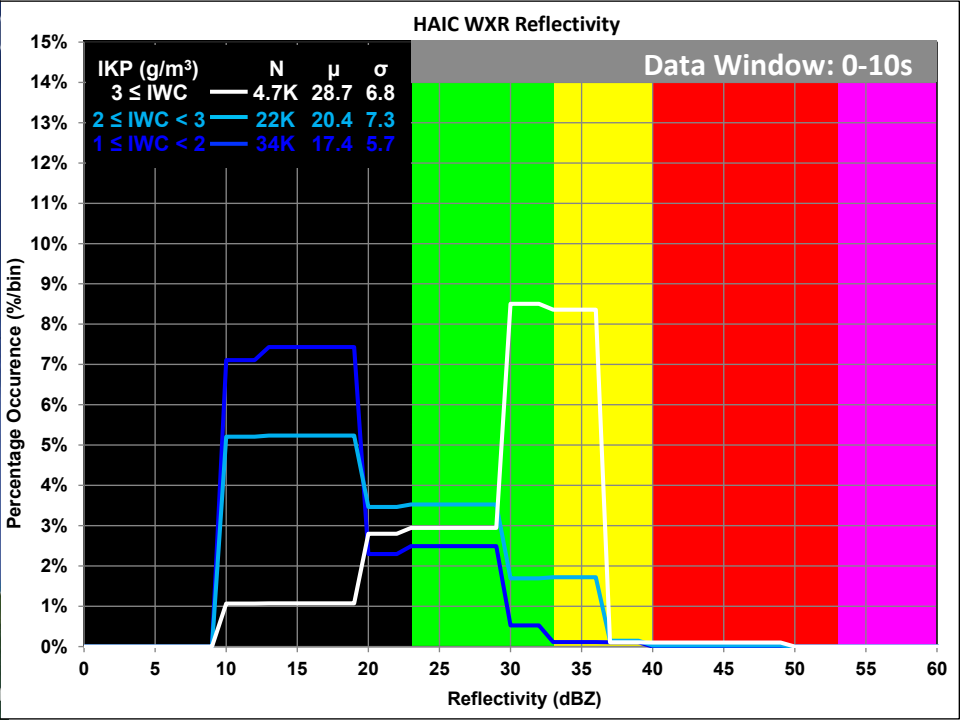
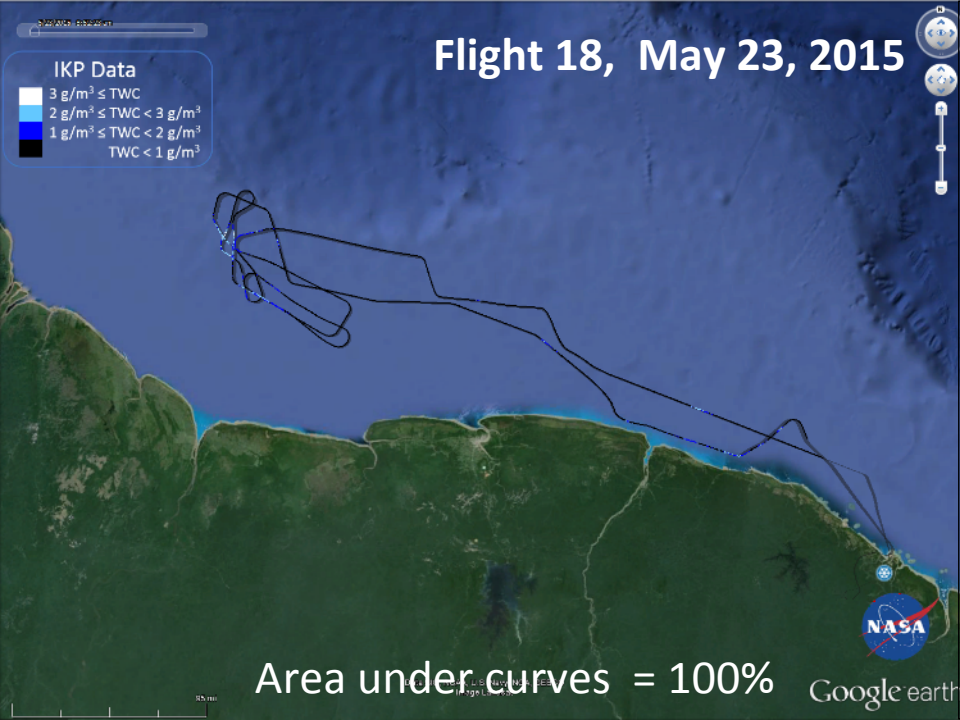
IKP and Reflectivity Flight 16, May 18





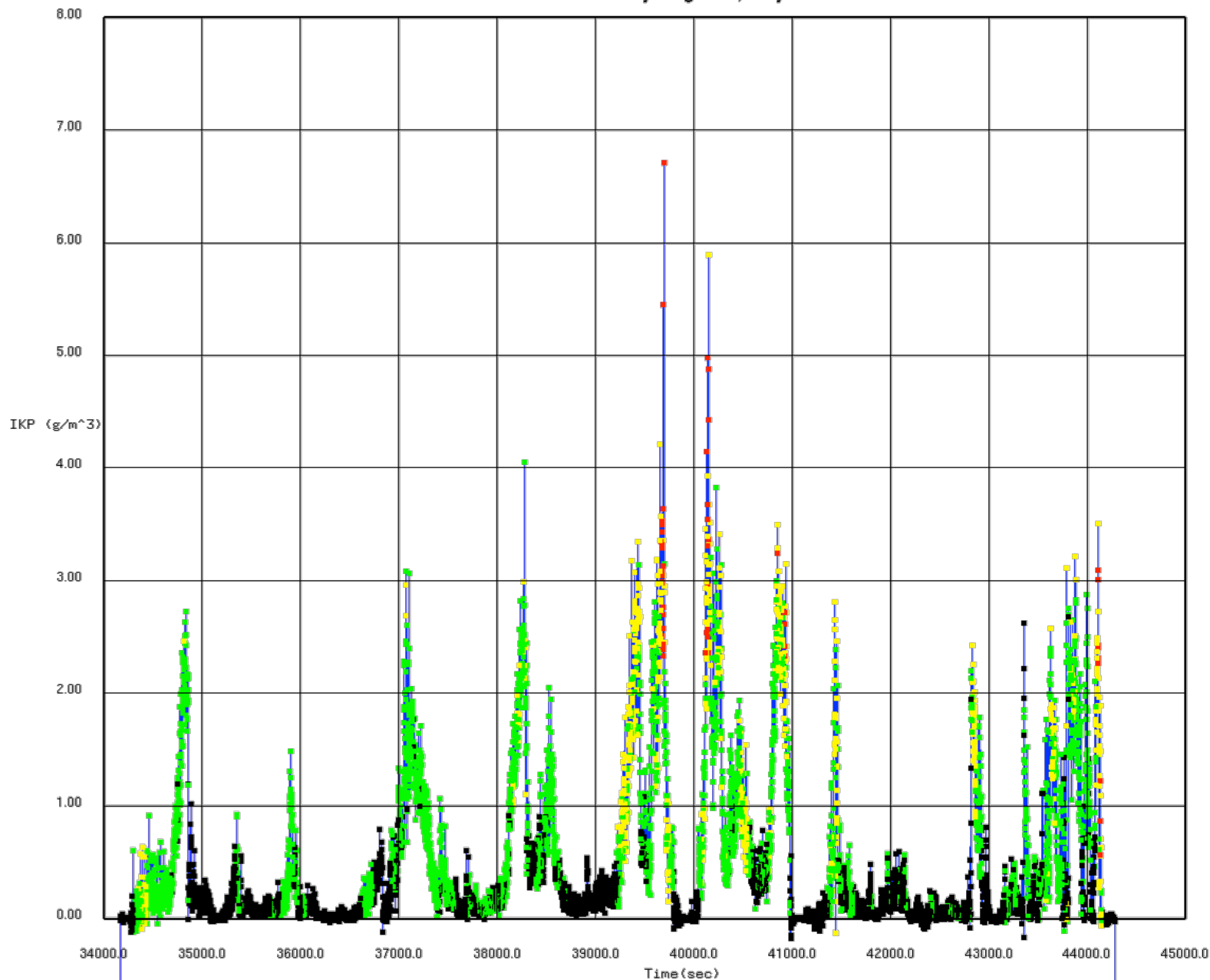
IKP and Reflectivity Flight 17, May 19



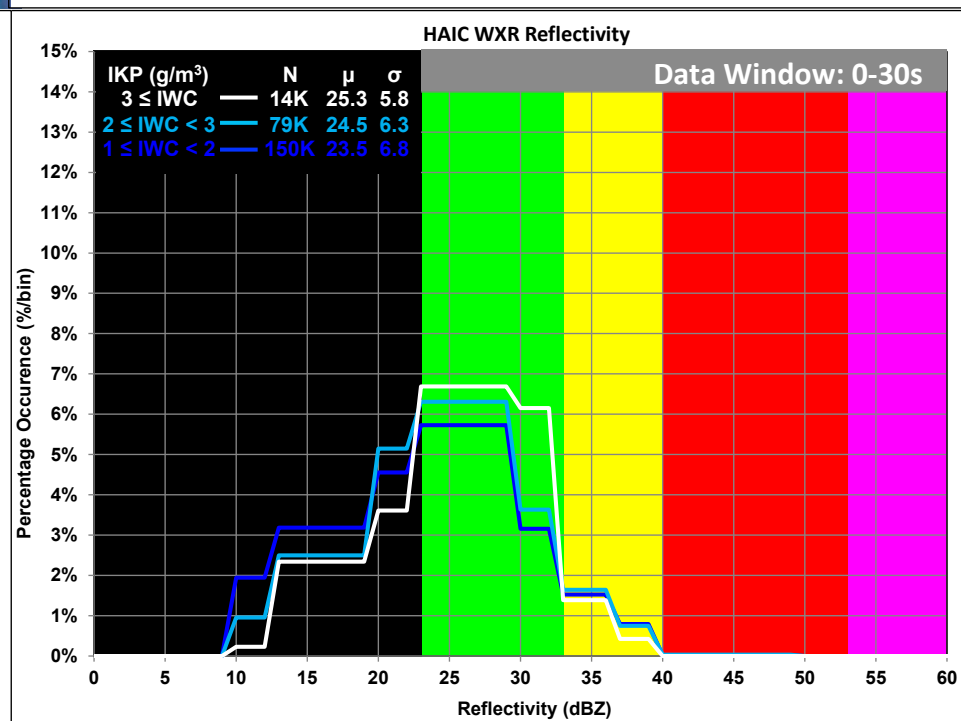
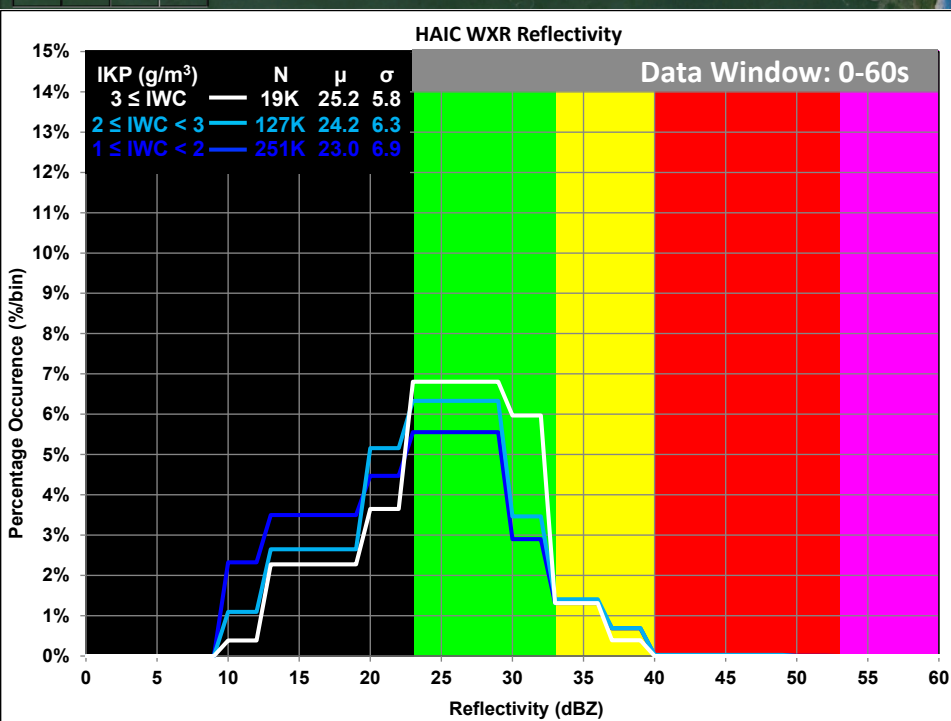
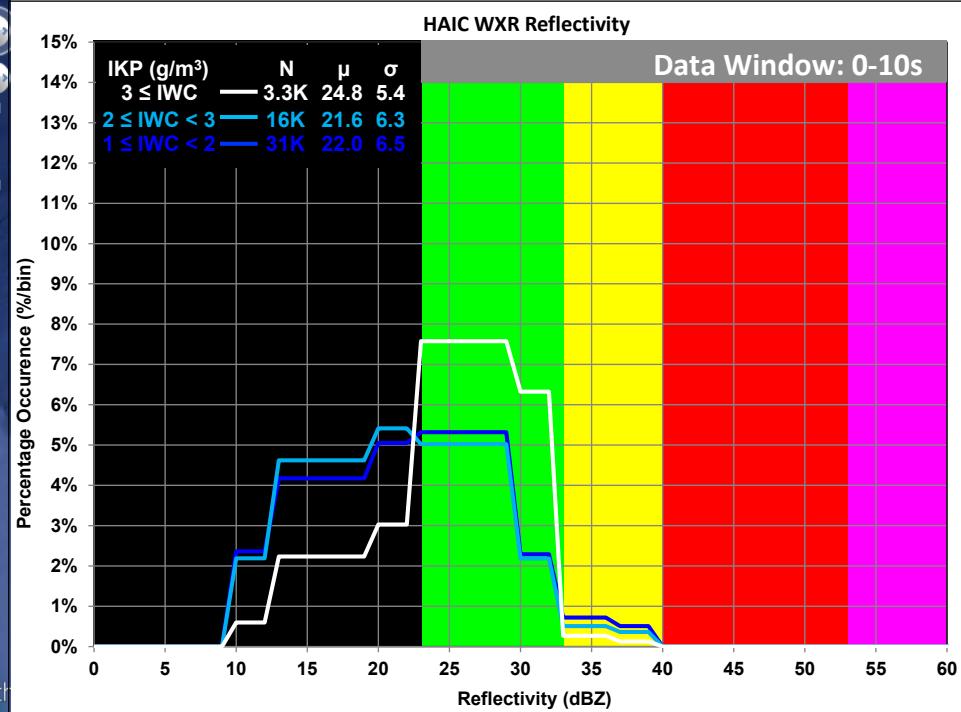
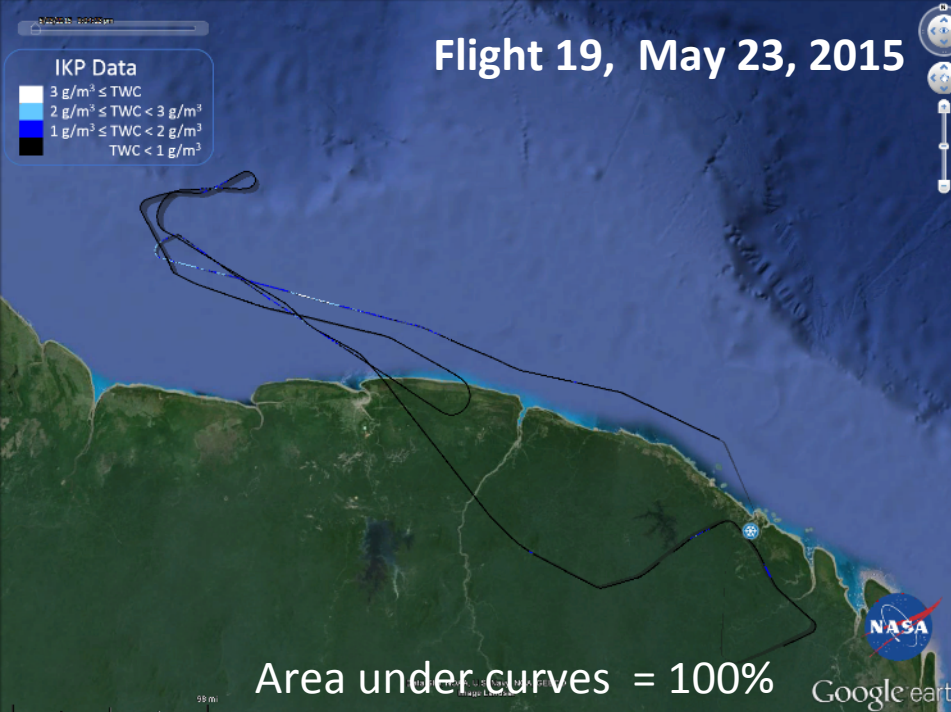


different Y-axis

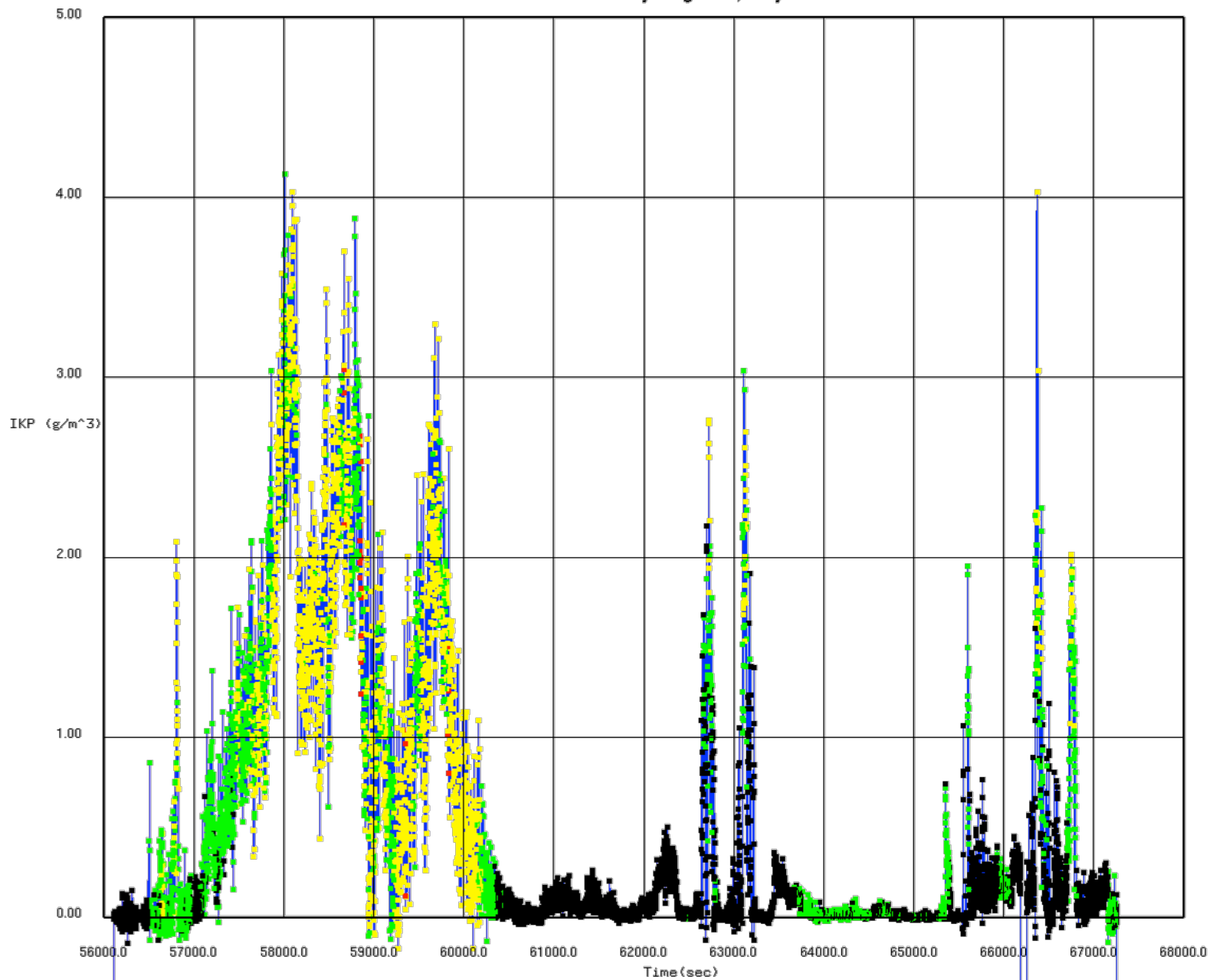
IKP and Reflectivity Flight 18, May 23

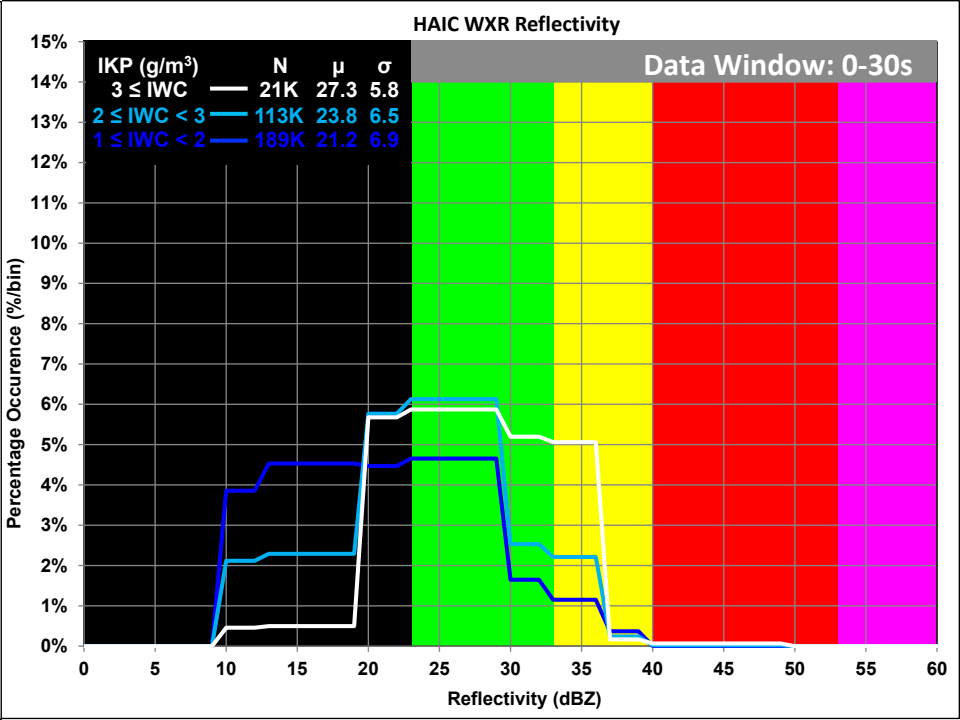
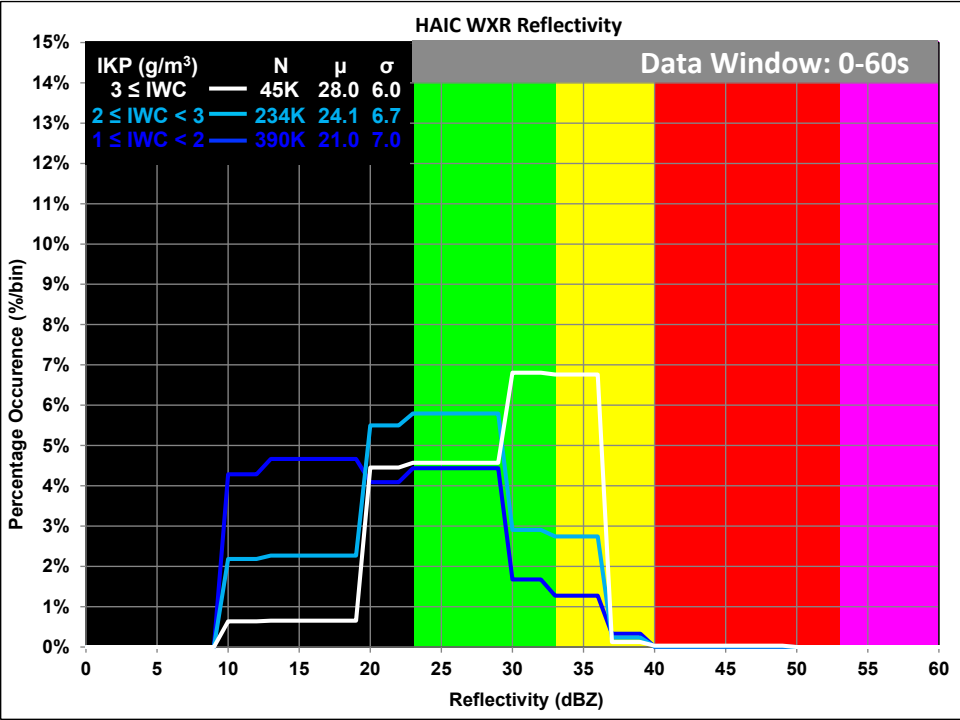
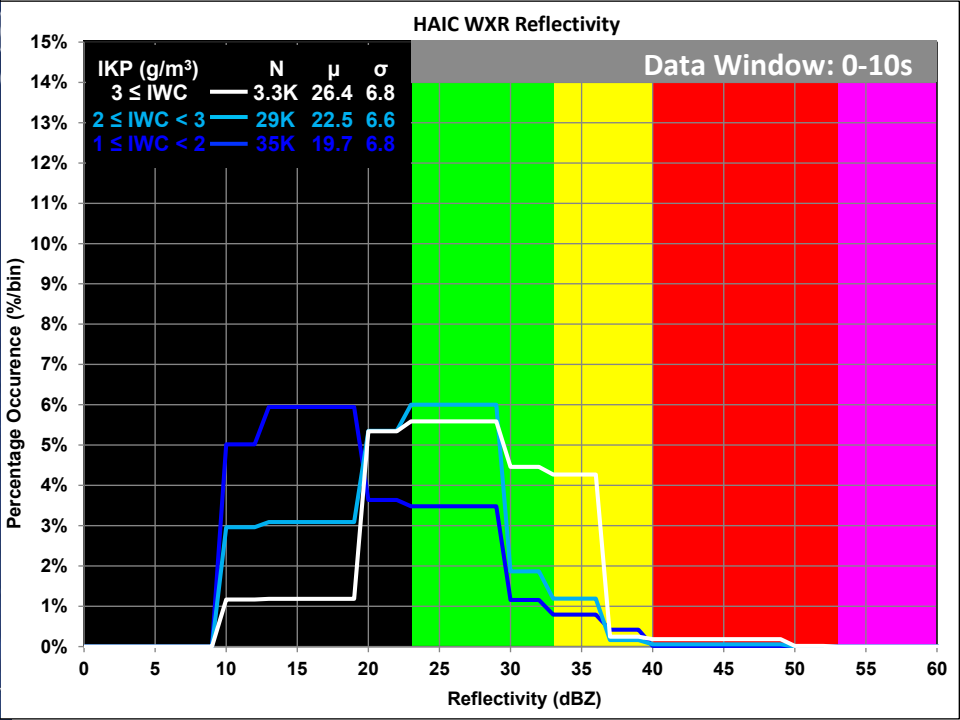
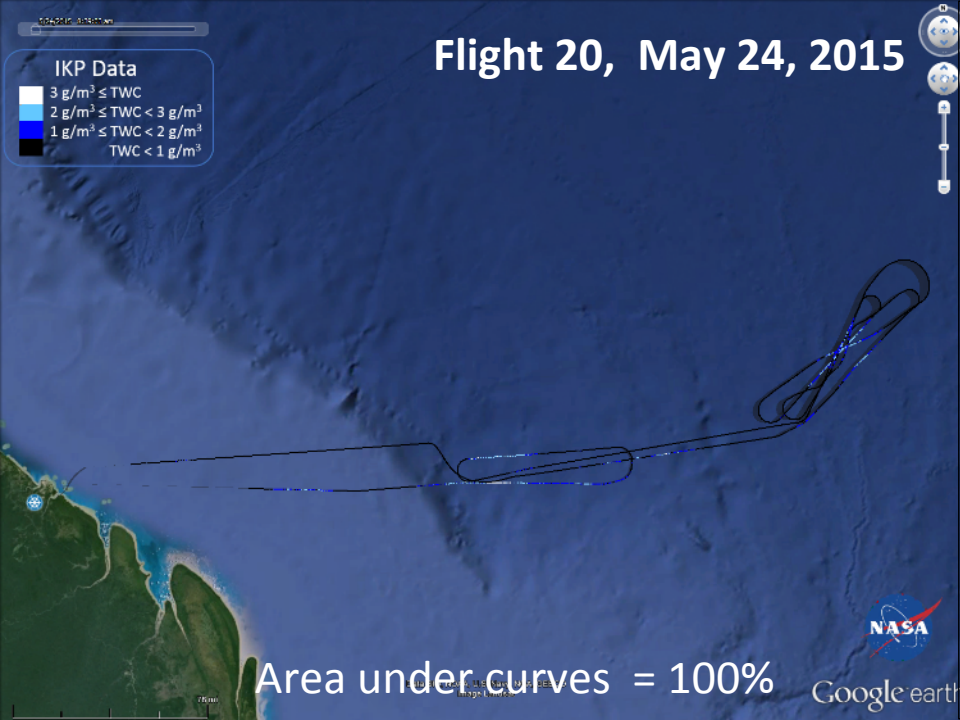


Flight 19, May 23, 2015

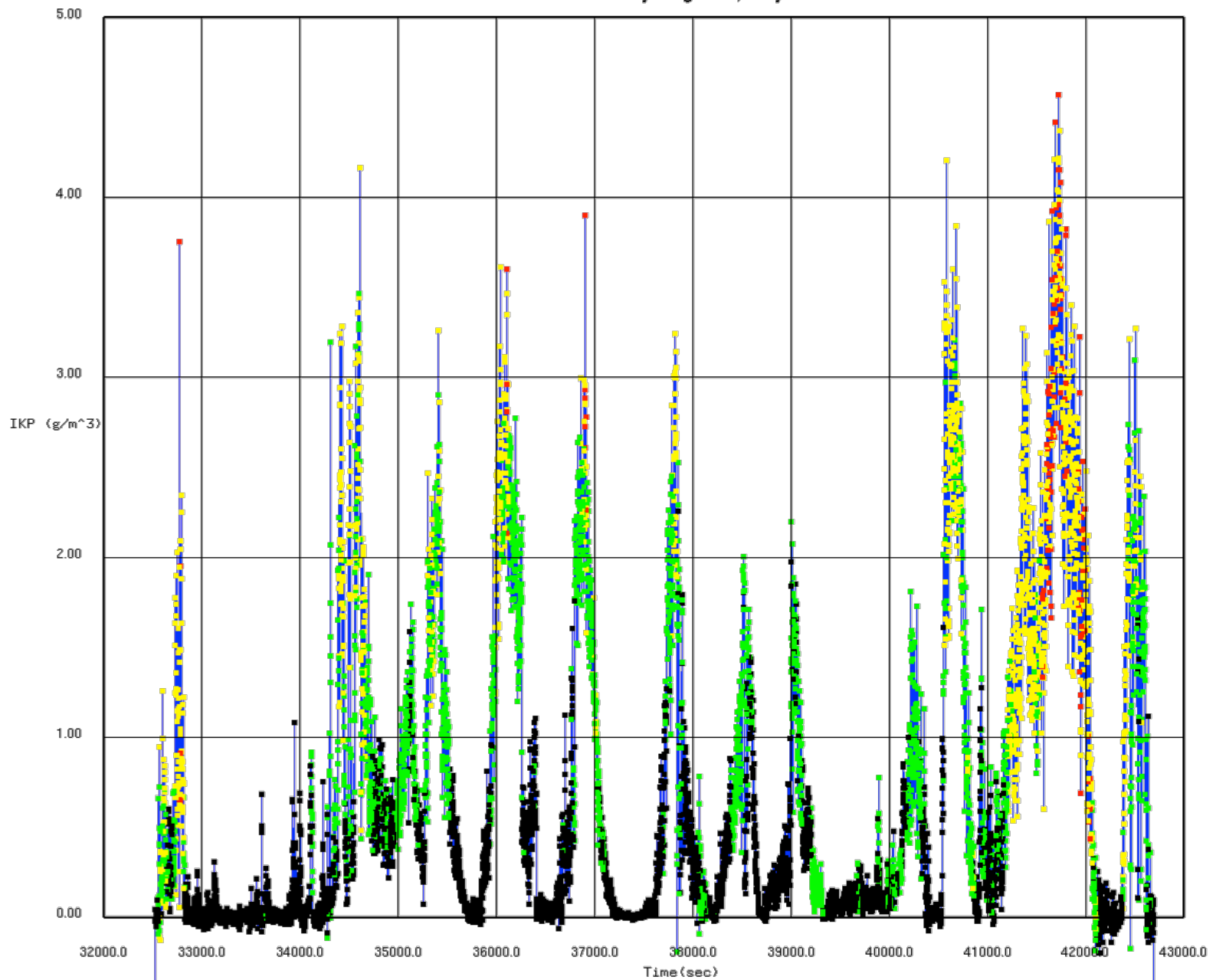


IKP and Reflectivity Flight 19, May 23

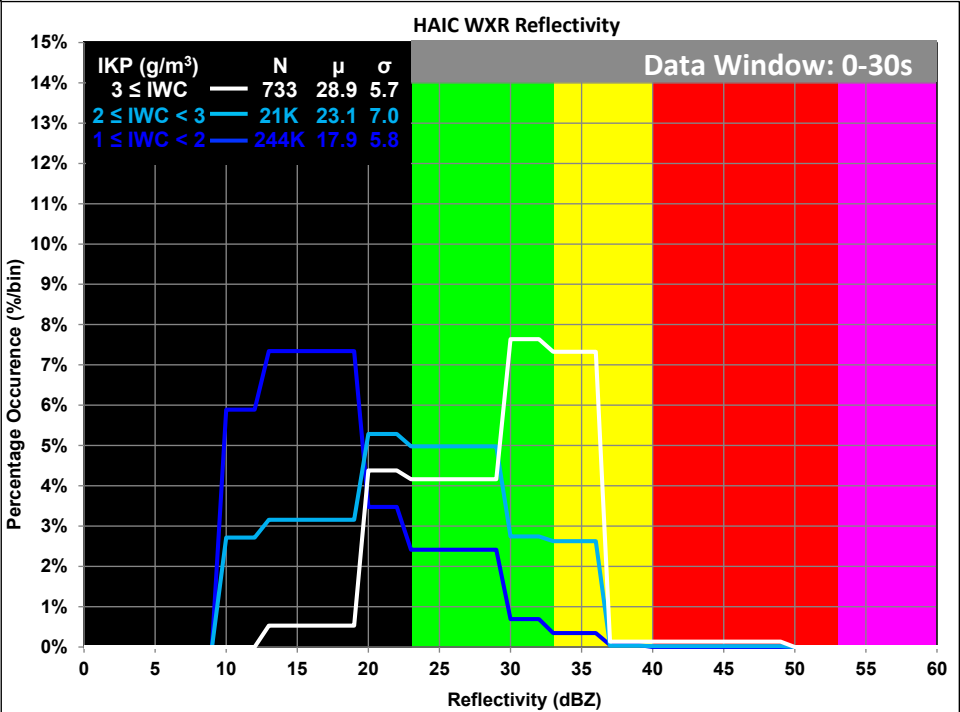
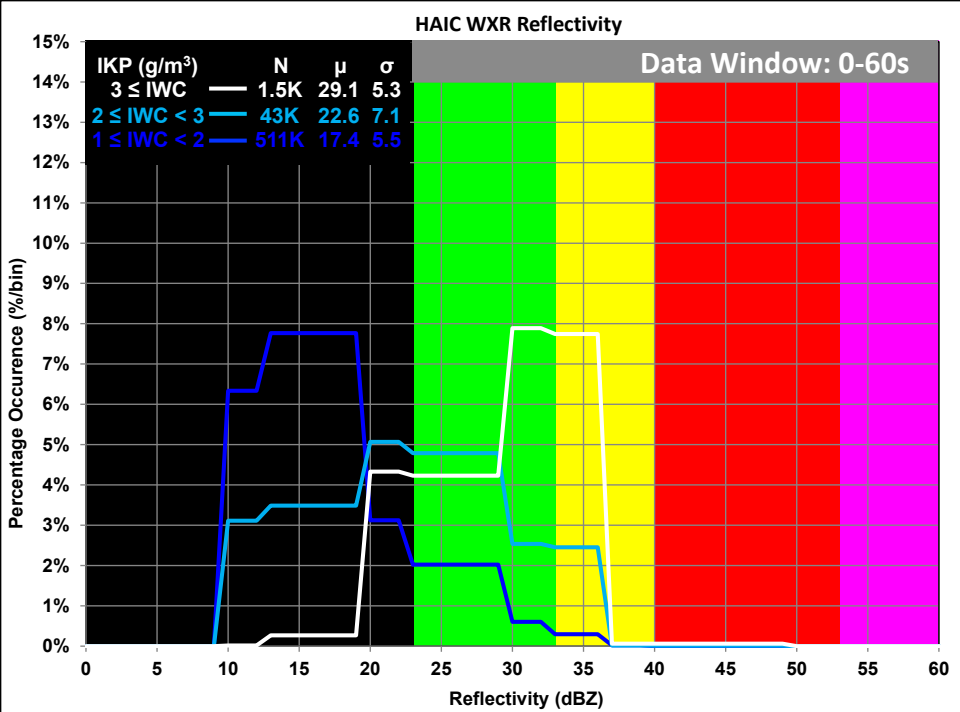
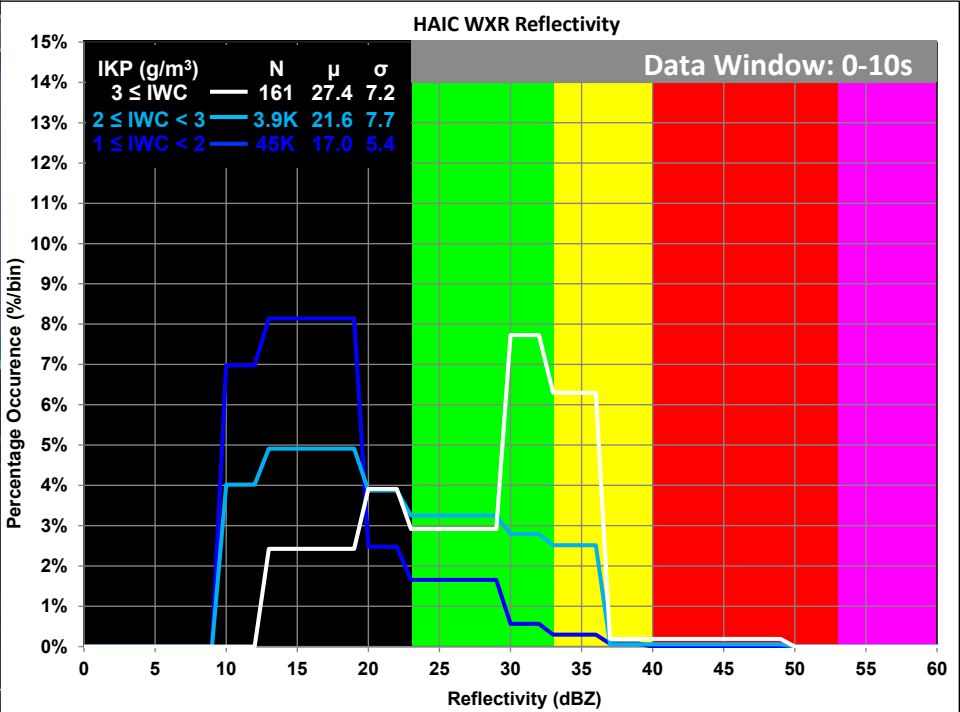
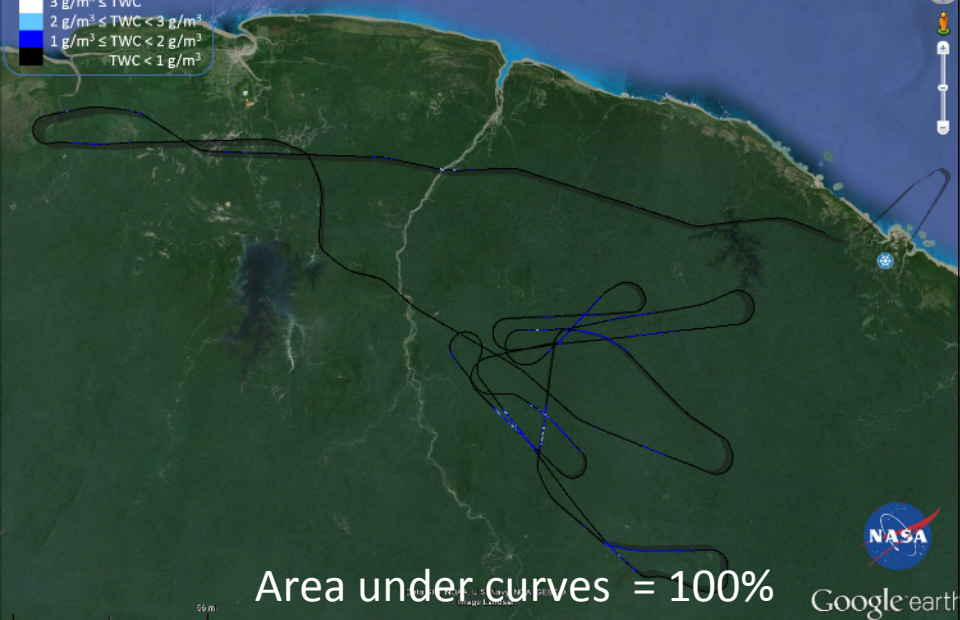
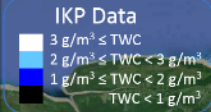




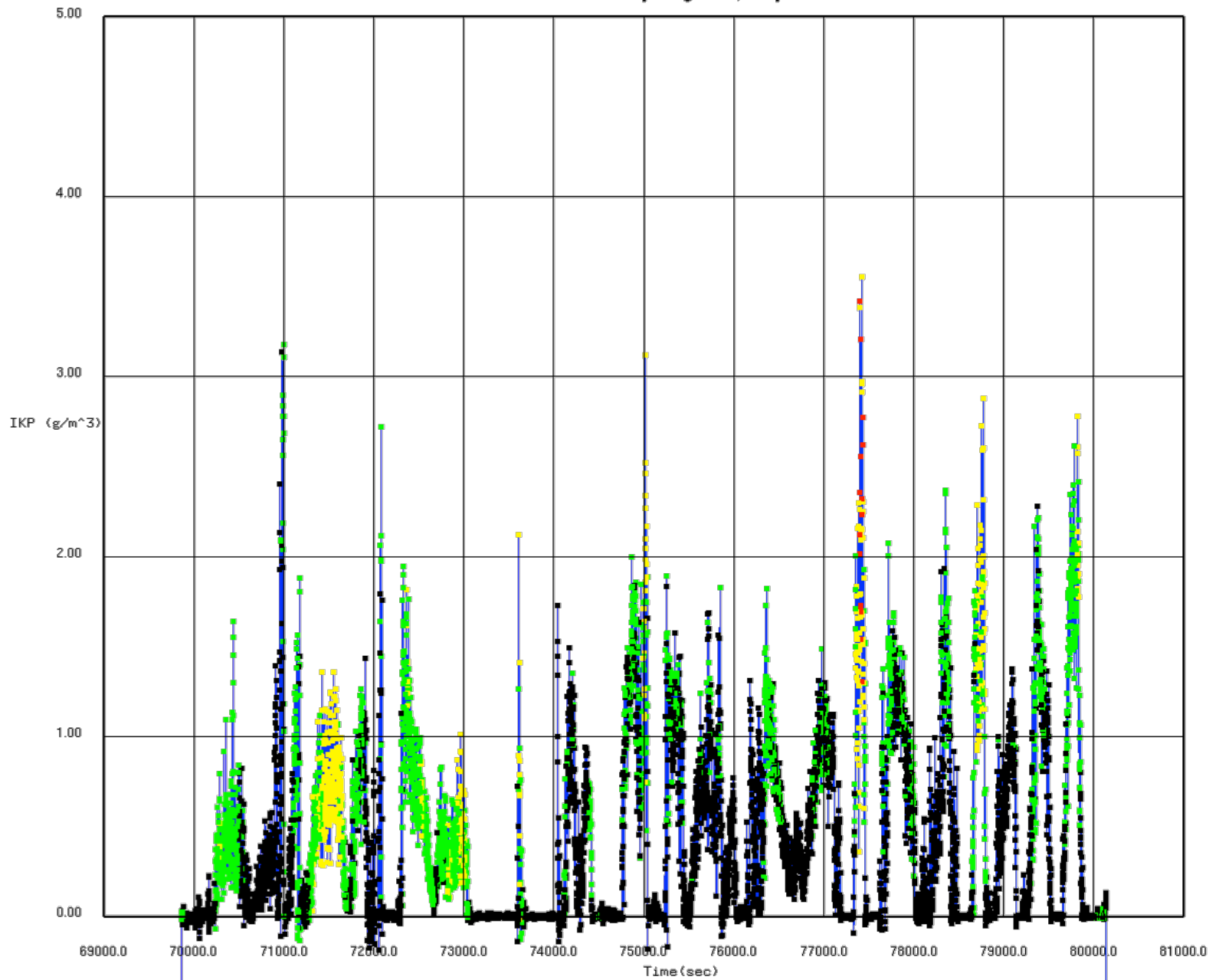
IKP and Reflectivity Flight 20, May 24

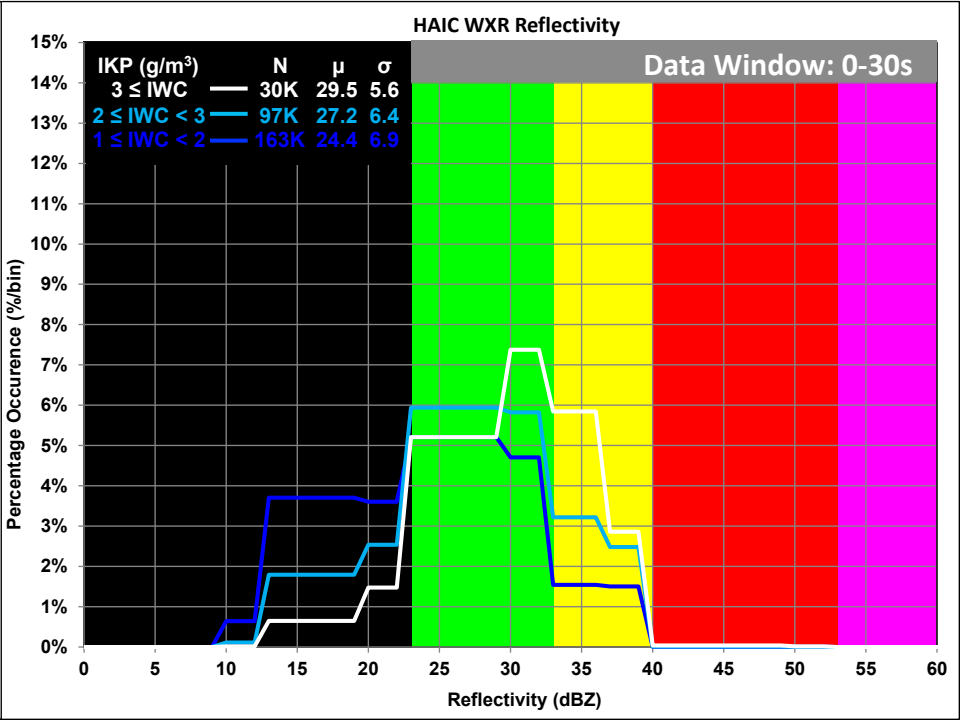
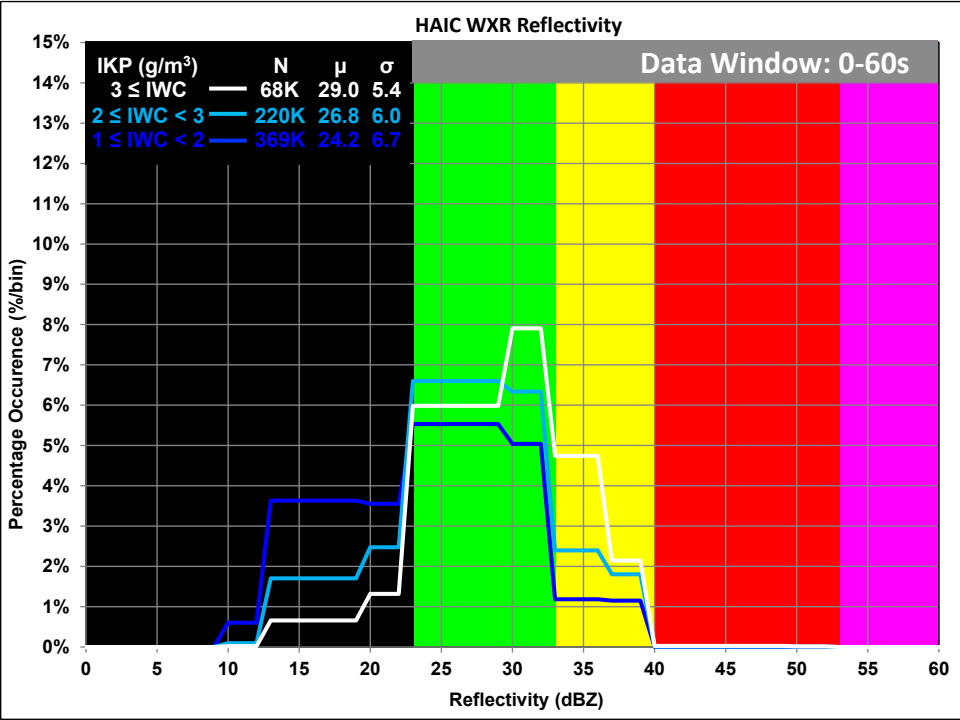
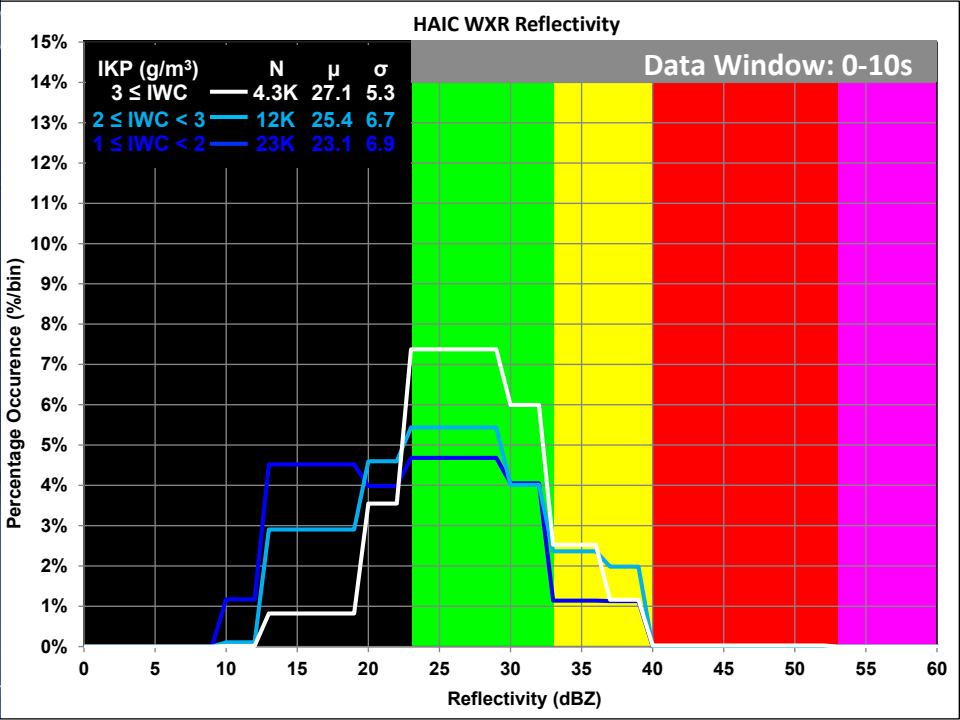
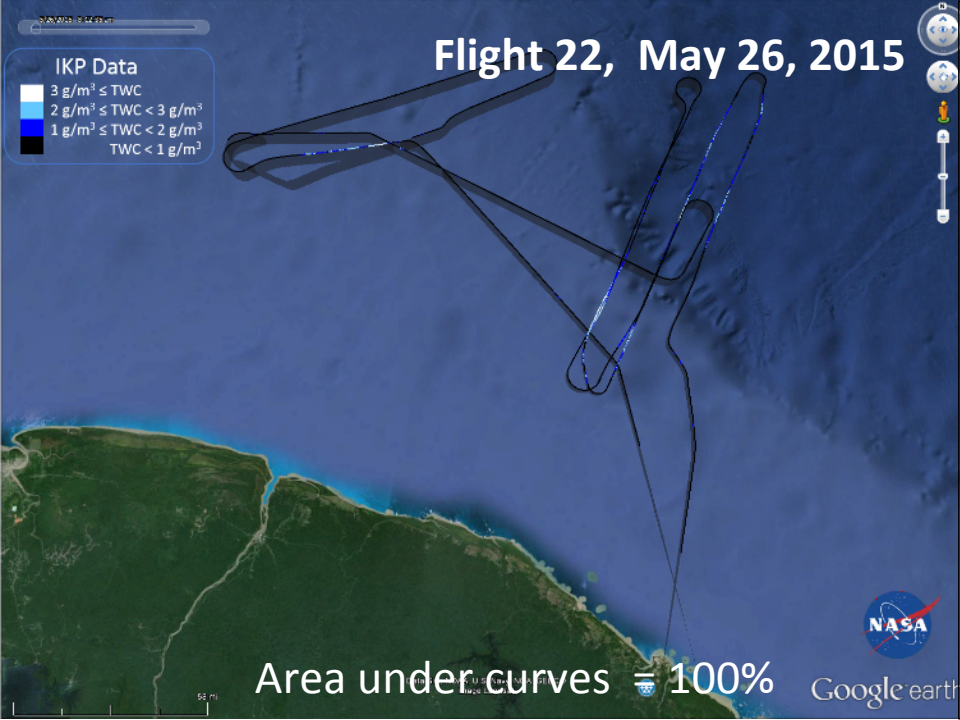


Flight 21, May 25, 2015



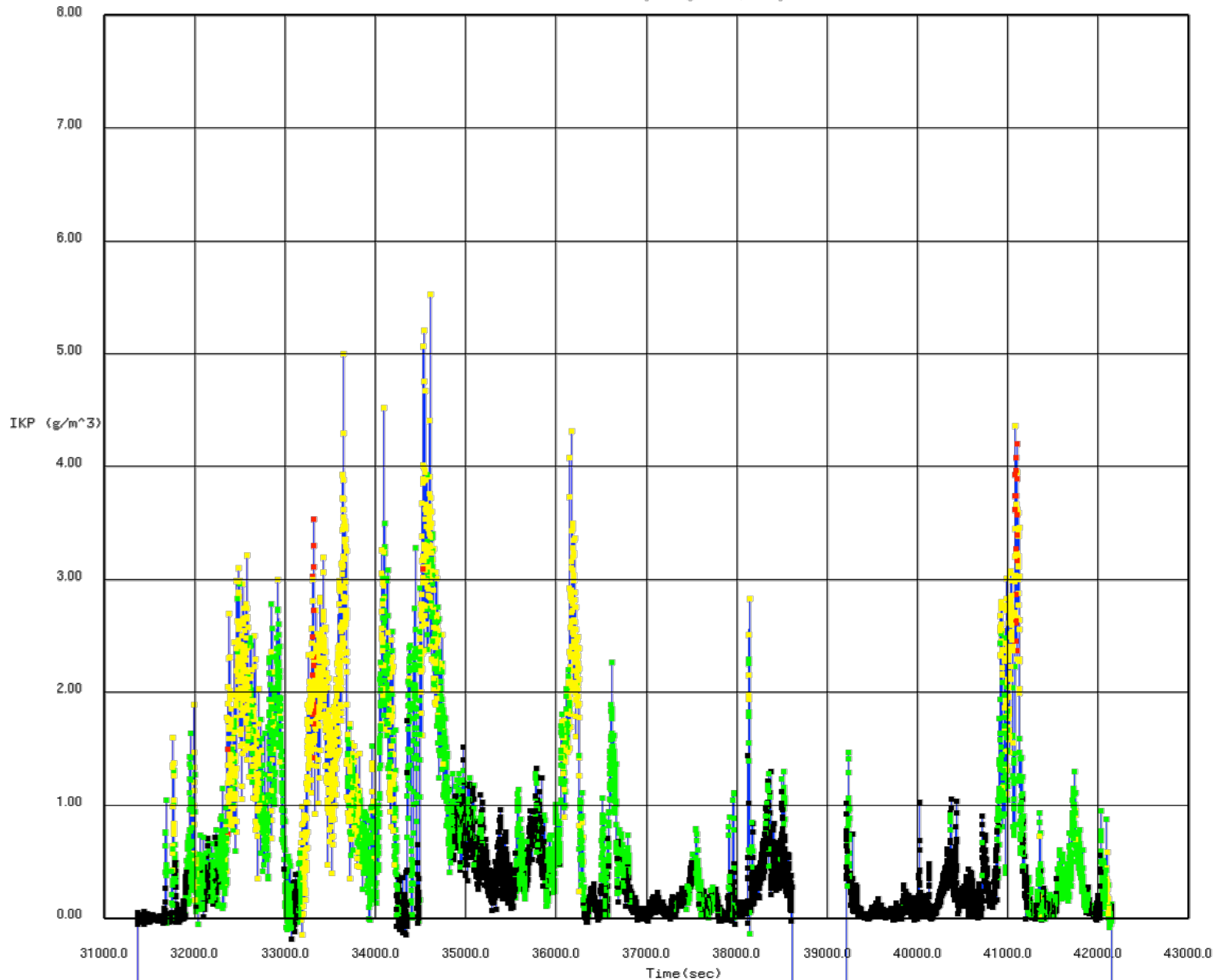
IKP and Reflectivity Flight 21, May 25

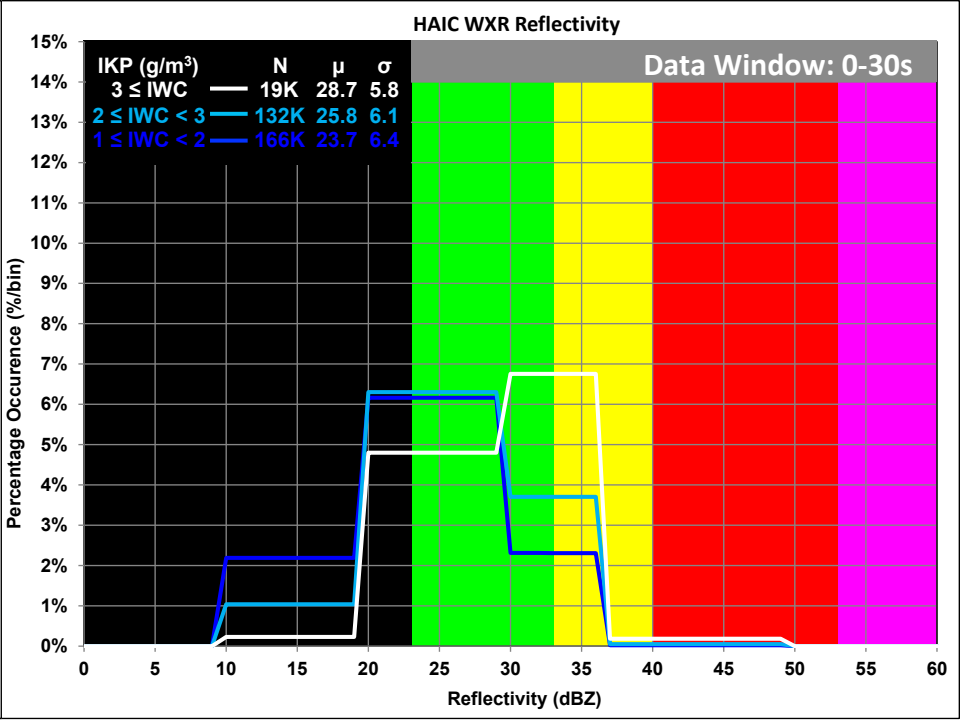
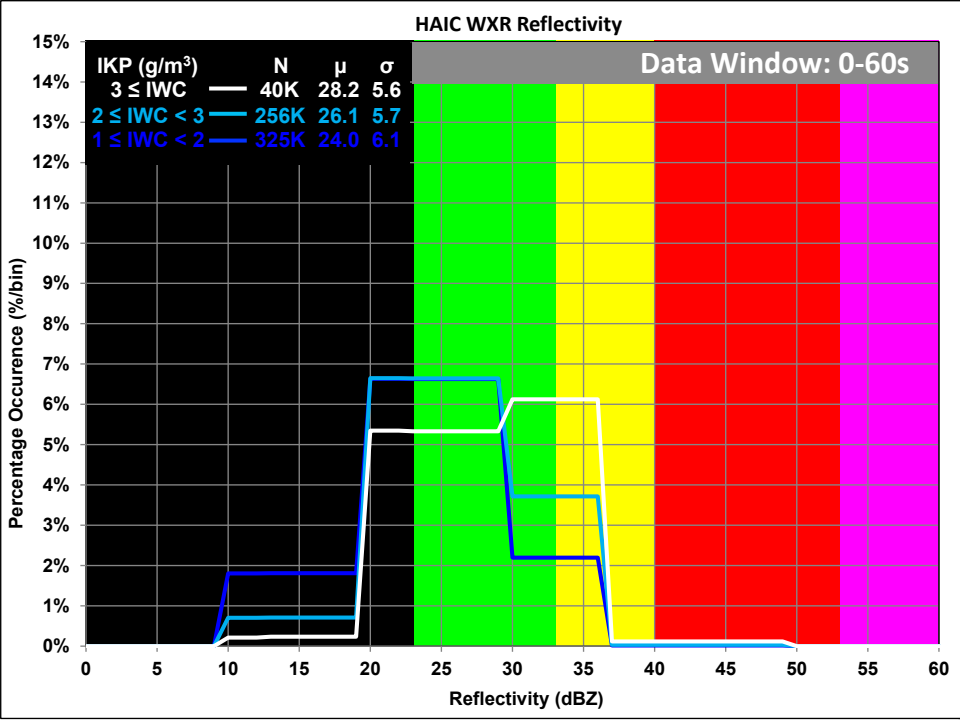
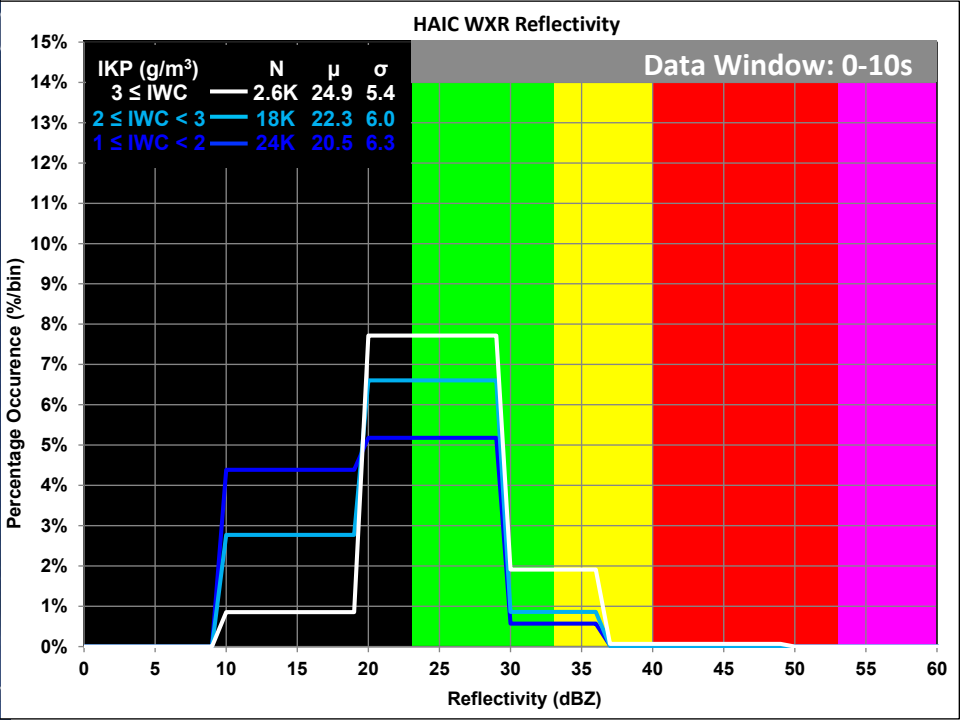
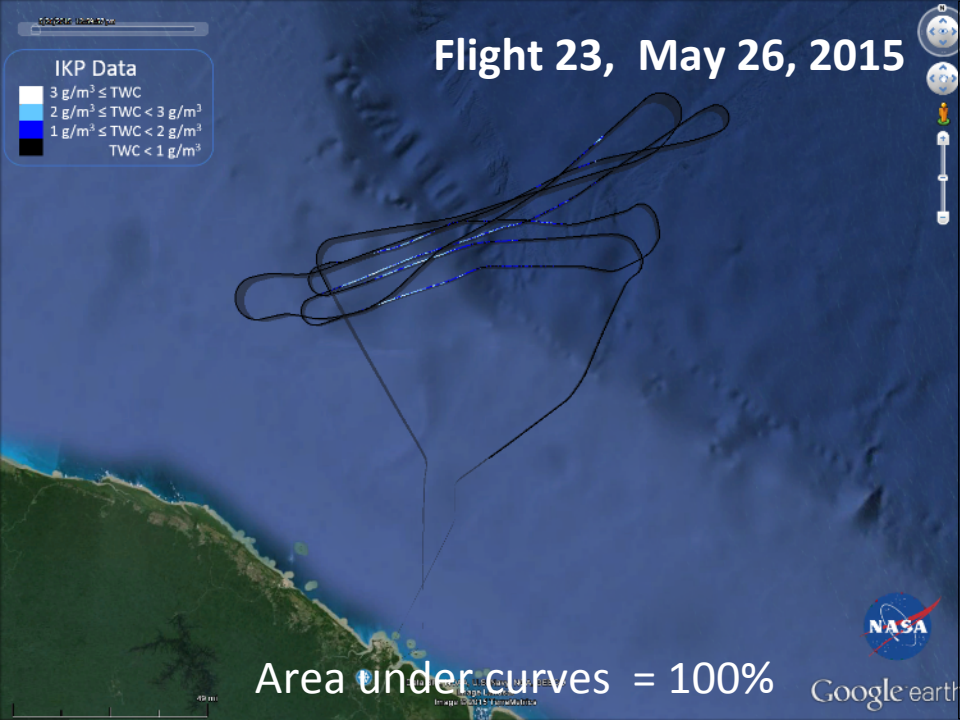




different Y-axis

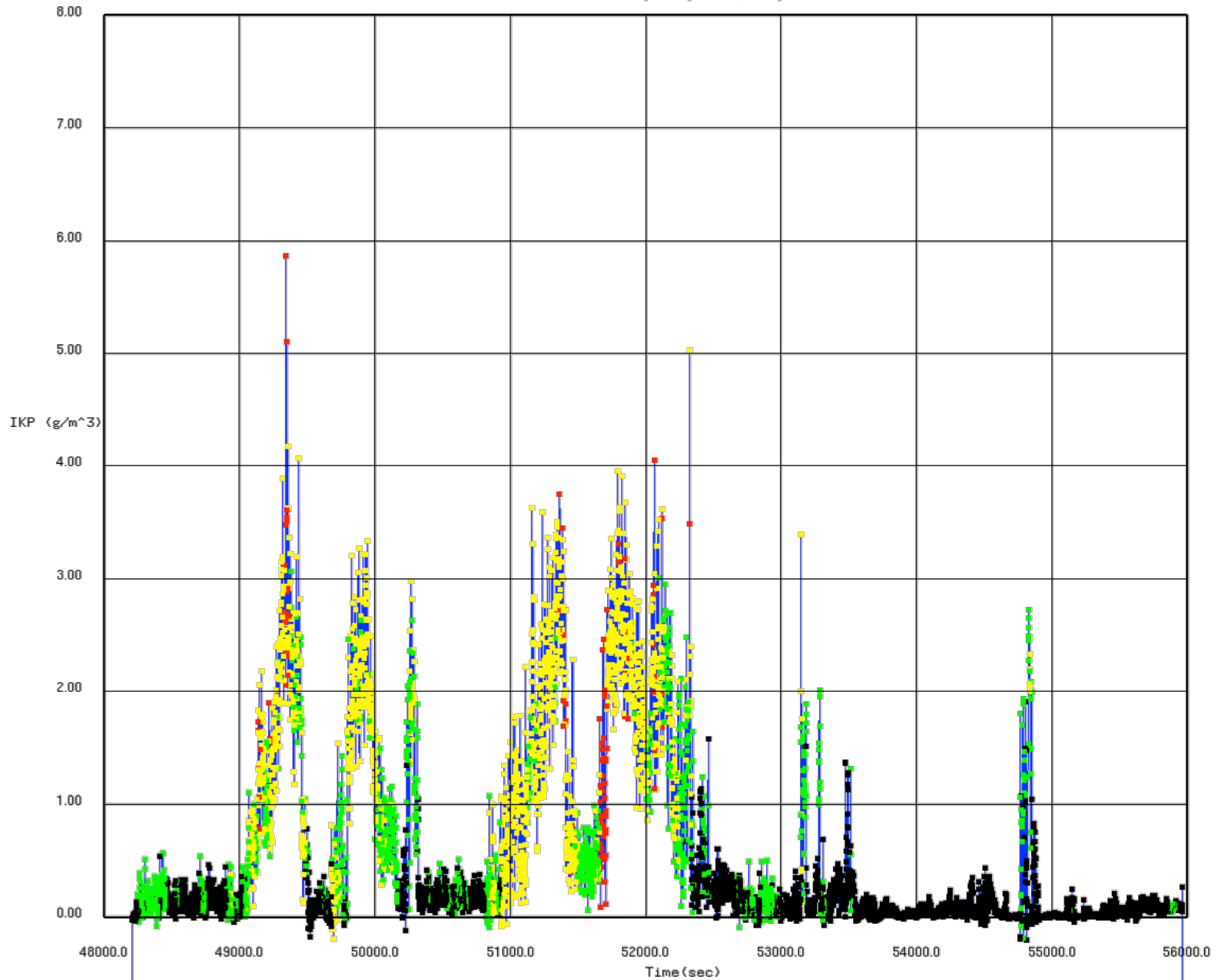
IKP and Reflectivity Flight 22, May 26

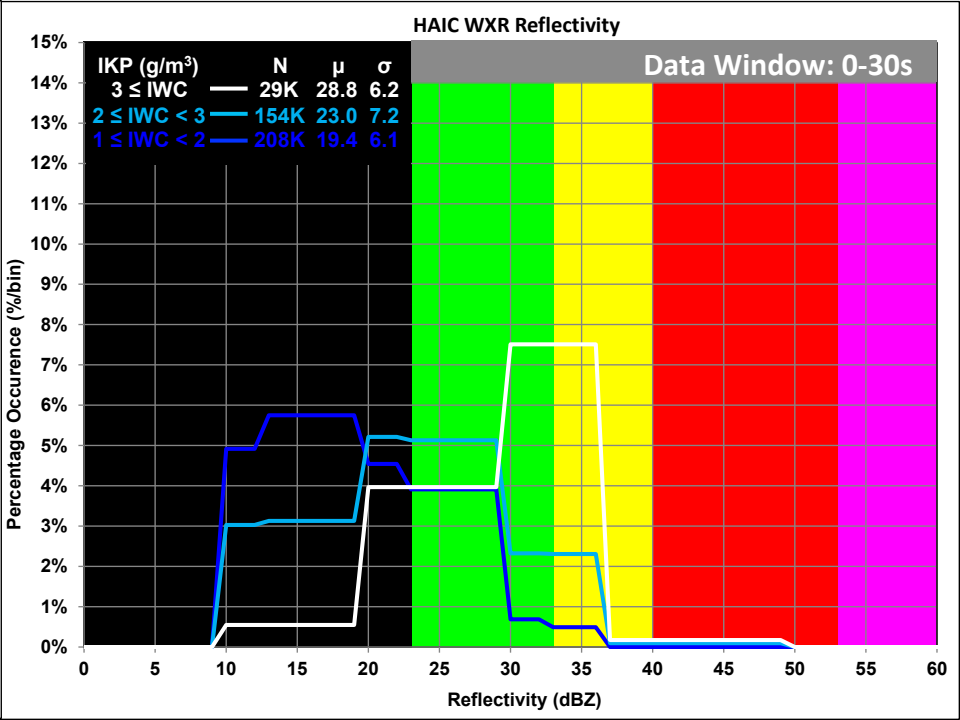
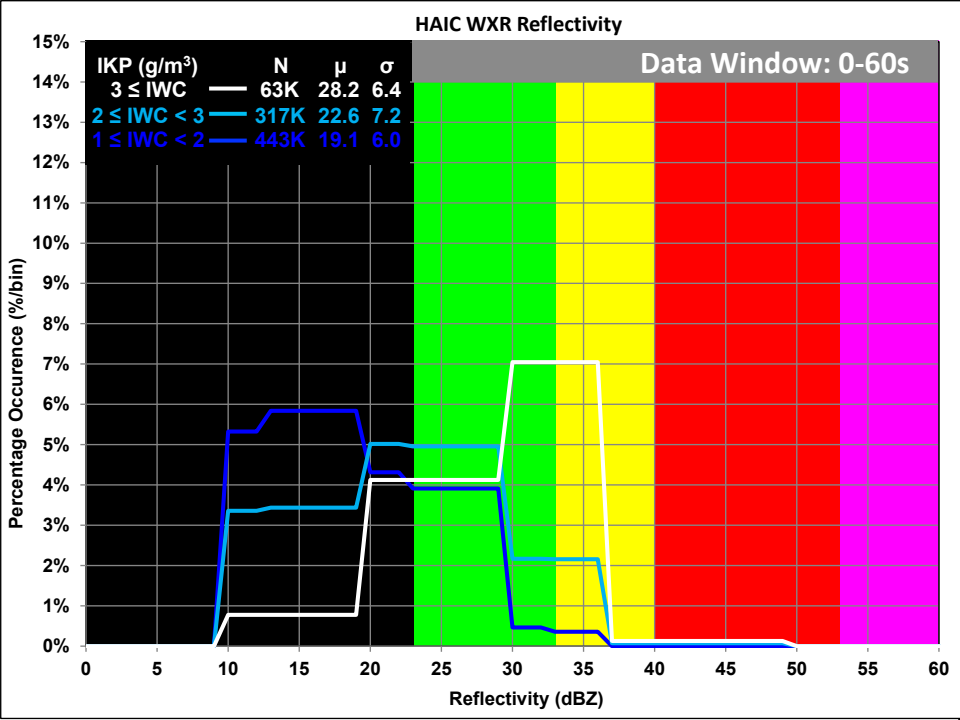
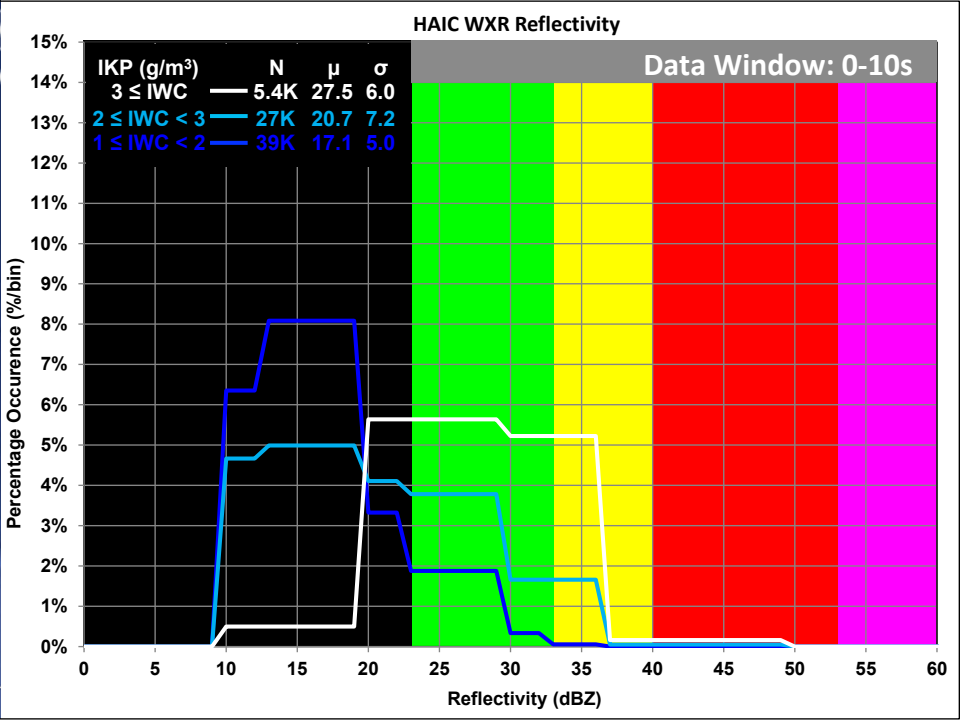
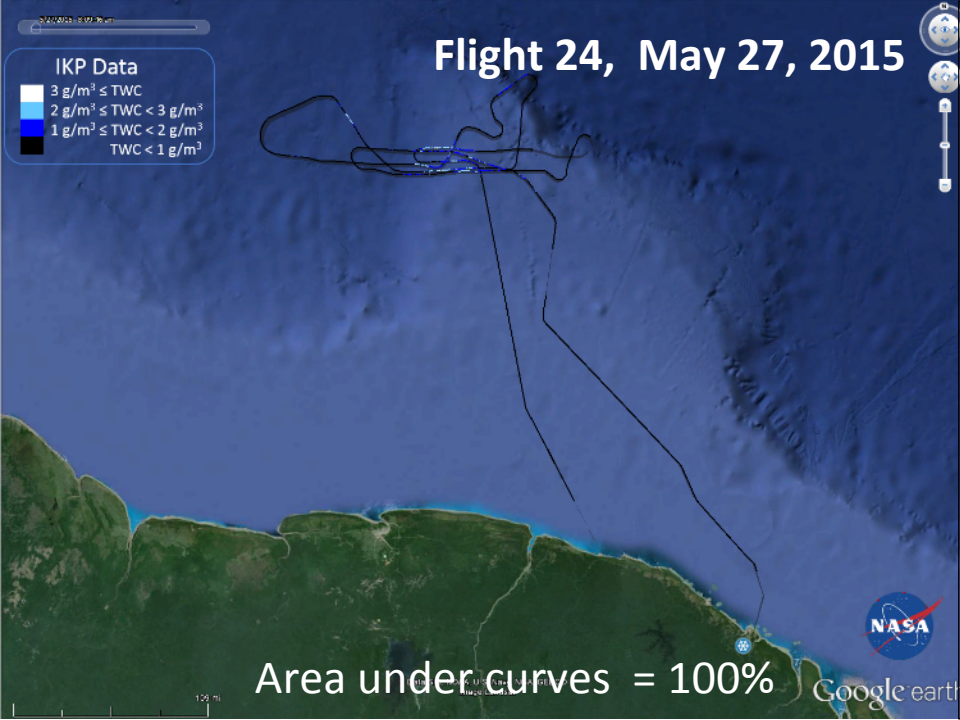




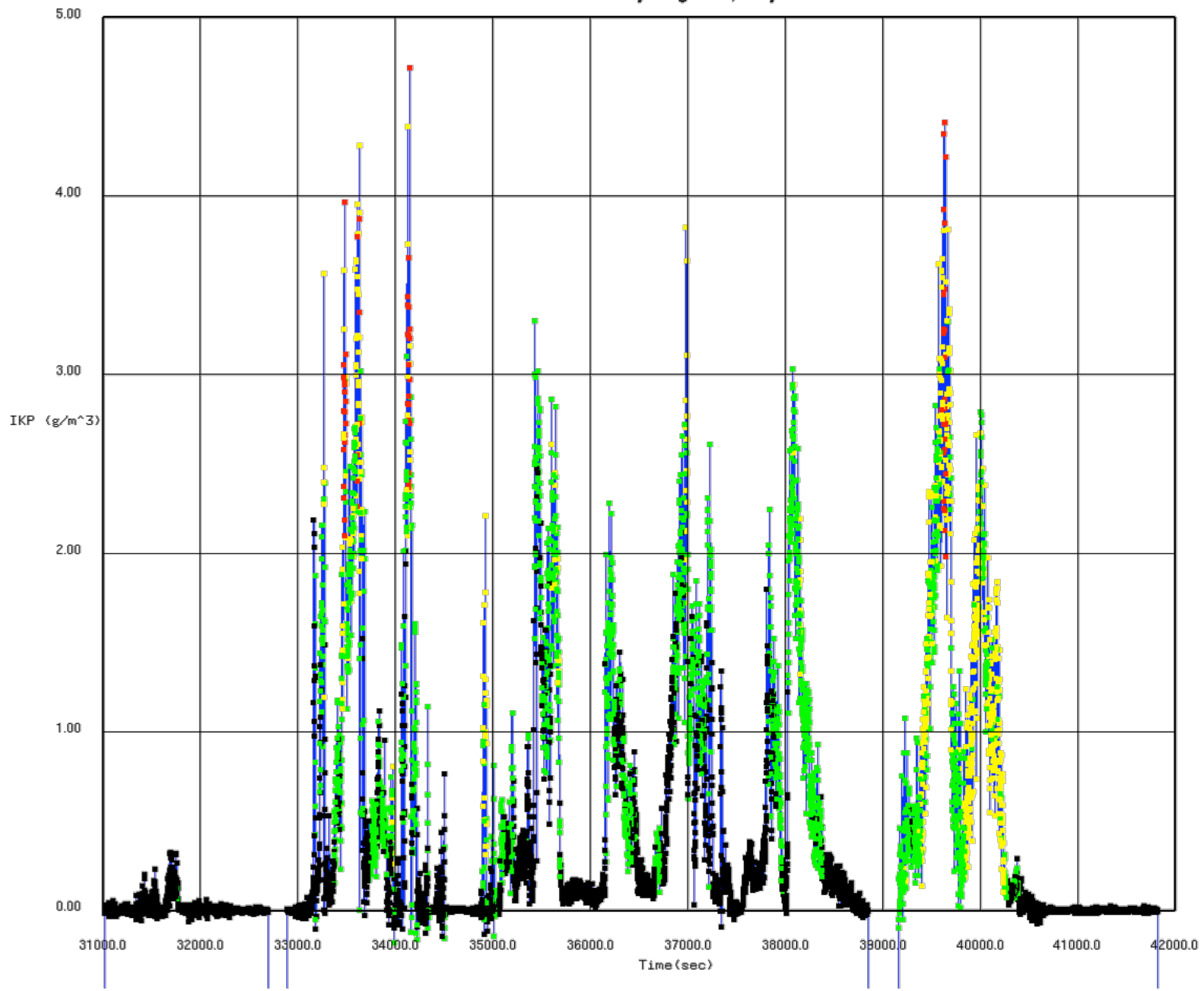
different Y-axis

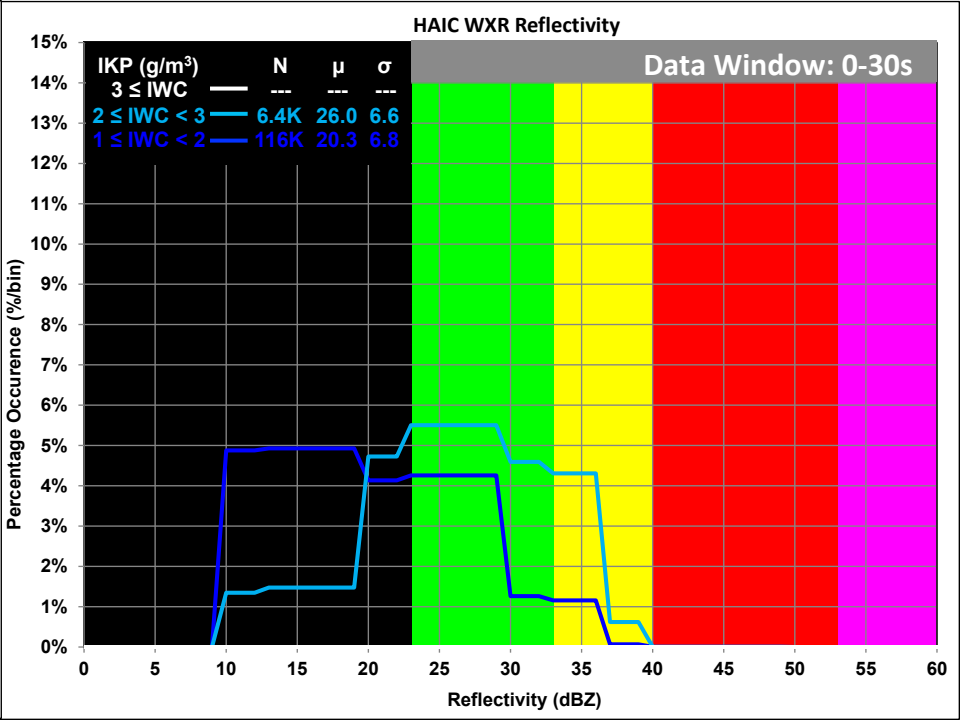
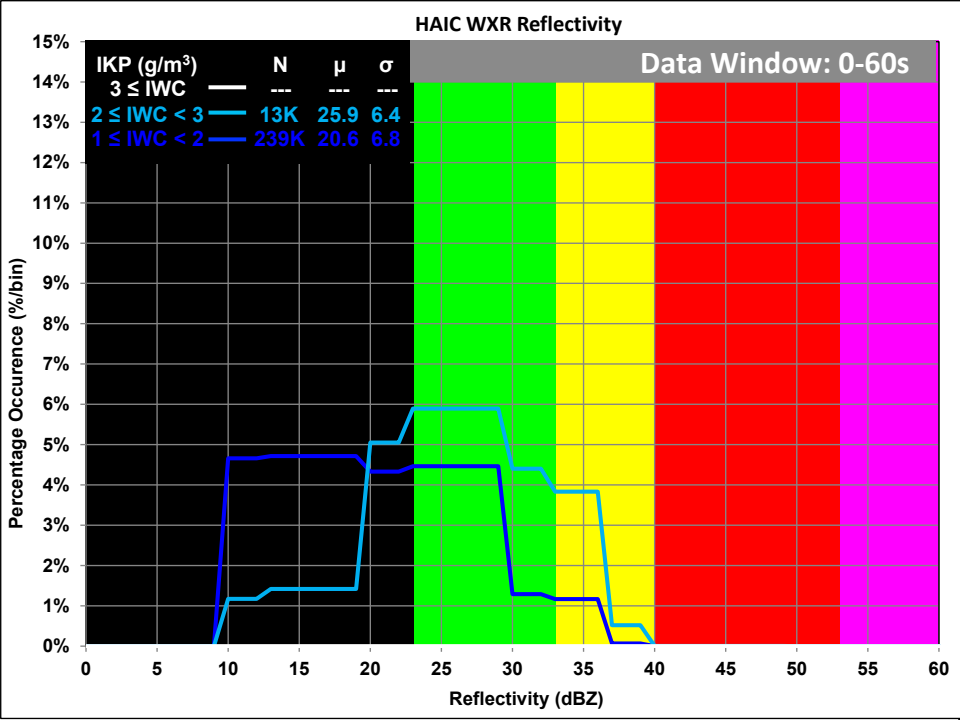
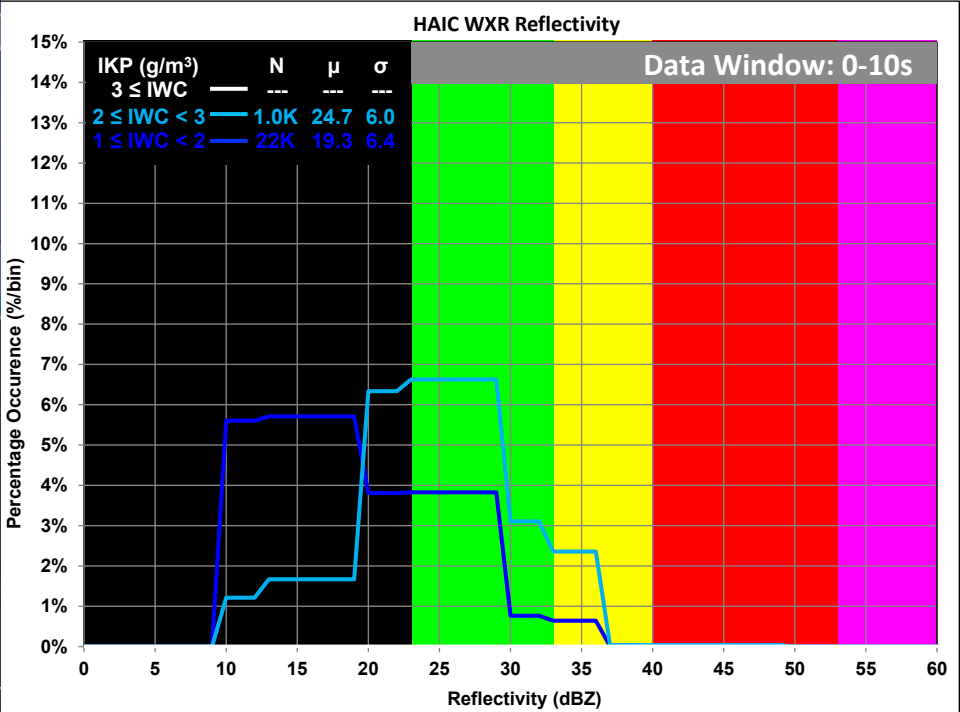
IKP and Reflectivity Flight 23, May 26



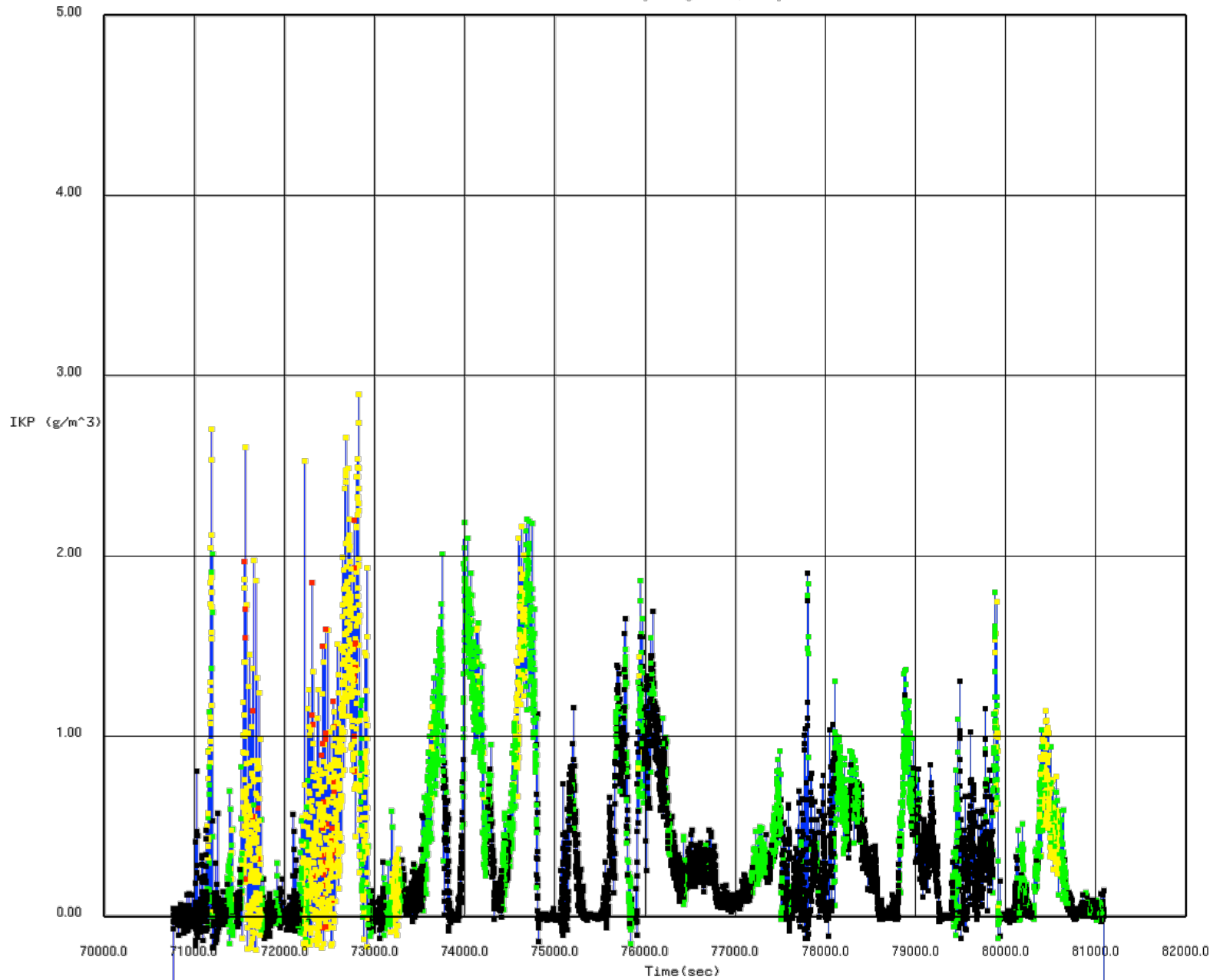


IKP and Reflectivity Flight 24, May 27



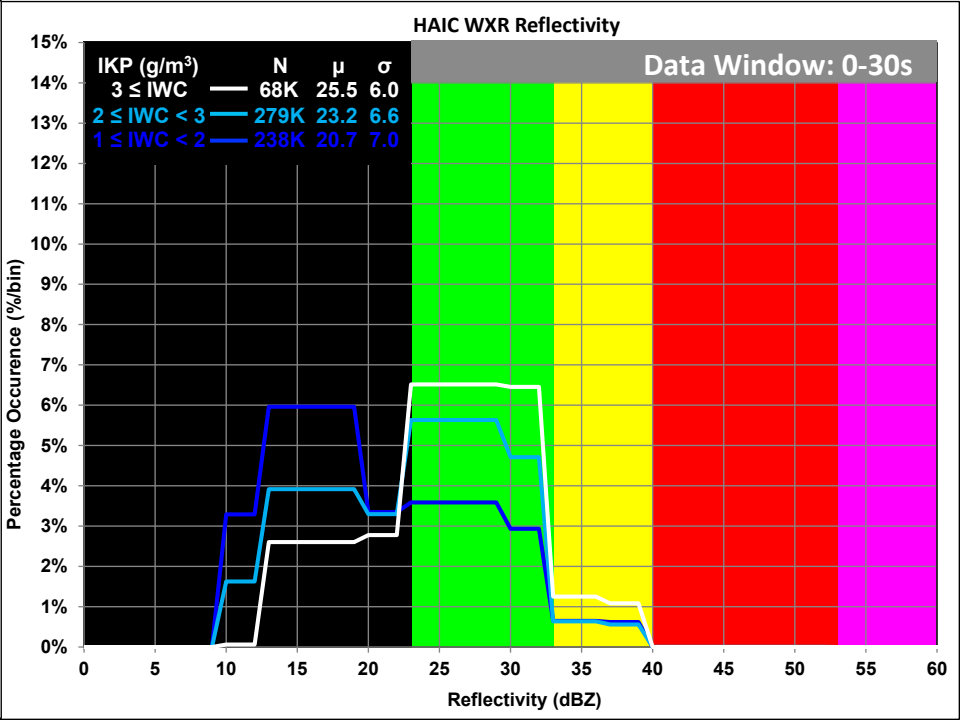
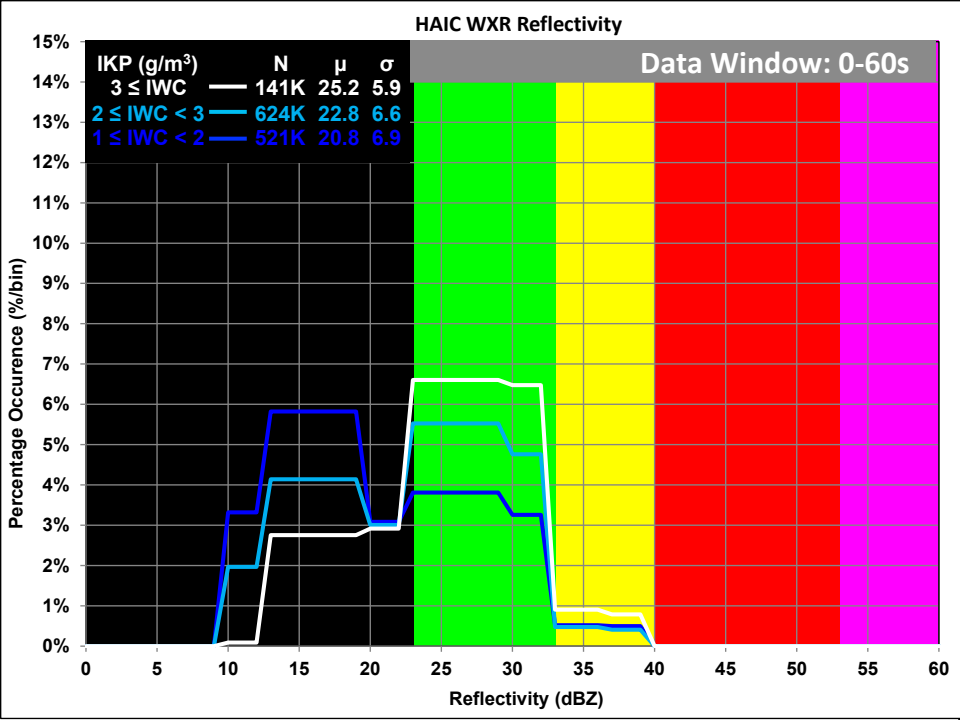
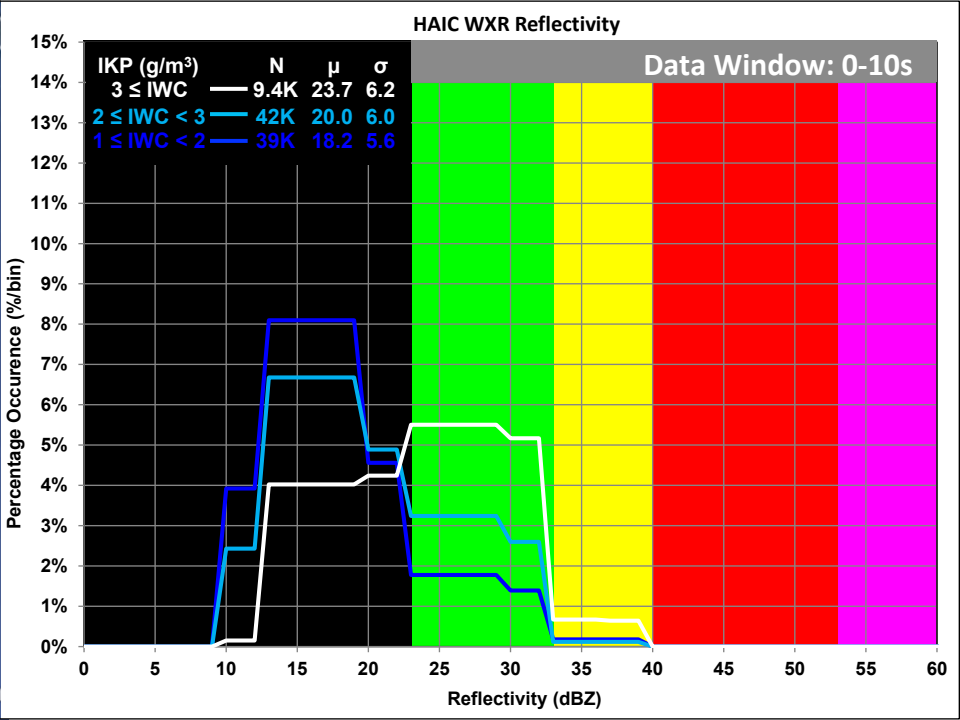
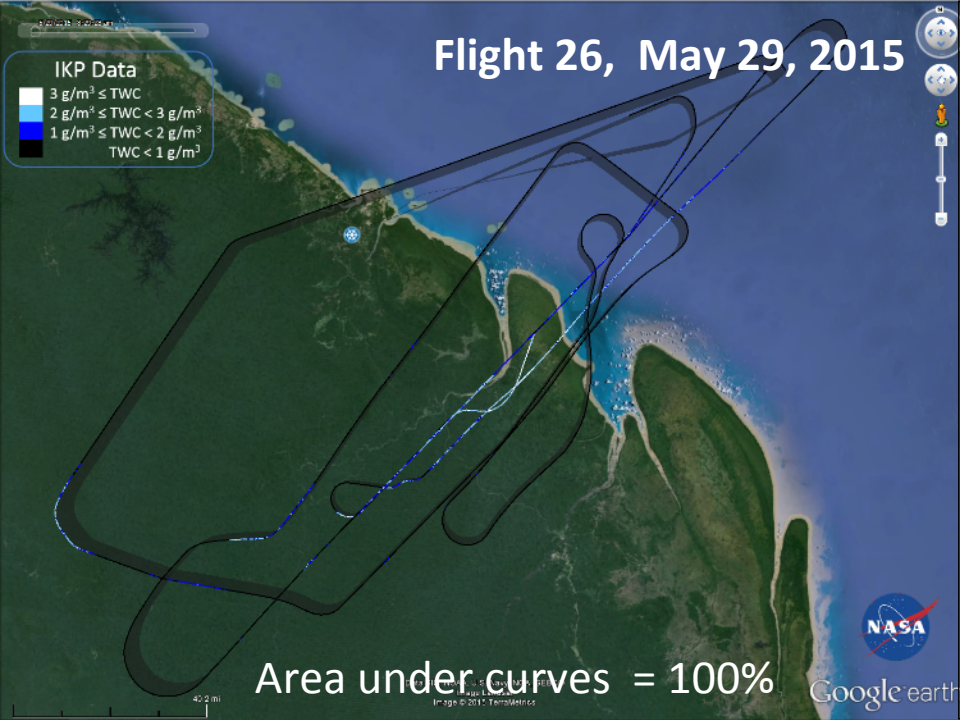


IKP and Reflectivity Flight 25, May 28



Flight 26, May 29, 2015

IKP Data
 3 g/m³ ≤ TWC
 2 g/m³ ≤ TWC < 3 g/m³
 1 g/m³ ≤ TWC < 2 g/m³
 TWC < 1 g/m³



IKP and Reflectivity Flight 26, May 29

