NOAA POES
Data Delivery Study

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Introduction and Methodology

- Data assimilation systems rely on timely data delivery
  - NCEP Global Forecast System
    - T + 2:45 (00, 06, 12, 18 UTC)
      - Early cycle (15 day forecast)
    - T + 6:05 (00 UTC), T + 5:50 (06, 18 UTC), T + 8:05 (12 UTC)
      - Late cycle (6 h forecast for Early and Late cycle background)
  - NCEP Regional (Eta) System
    - T + 1:10 (00, 12 UTC), T + 0:50 (06, 18 UTC)
      - Early cycle (84 h forecast)
    - T + 10:40 (t-12 EDAS 00, 12 UTC), T + 11:20 (t-12 EDAS 06, 18 UTC)
      - Late cycle (3 h forecast from t-12 to t-09)
    - T + 7:40 (t-09 EDAS 00, 12 UTC), T + 8:20 (t-09 EDAS 06, 18 UTC)
      - Late cycle (3 h forecast from t-09 to t-06)
    - T + 4:40 (t-06 EDAS 00, 12 UTC), T + 5:20 (t-06 EDAS 06, 18 UTC)
      - Late cycle (3 h forecast from t-06 to t-03)
    - T + 2:00 (t-03 EDAS 00, 12 UTC), T + 2:20 (t-03 EDAS 06, 18 UTC)
      - Late cycle (3 h forecast from t-06 to t-03 for Early and t-12 Late cycle background)
- POES observations transmitted orbitally

Introduction and Methodology (cont)

- Continued user pressure to deliver forecasts earlier
- Possible earlier data delivery in NPOESS era
- Earlier data assimilation cutoff conflicts with data receipt
- This study
  - Considers POES availability at NCEP
  - Quantifies operational data receipt for various cutoff times
  - Simulates operational data preparation process
    - Retrieves POES radiances from operational data storage files
    - Duplicate checking
    - Prepares data for use in assimilation cycle

NOAA POES Observations Availability Platforms and Instruments

NOAA Satellite	Instrument
NOAA-14	HIRS-2 MSU
NOAA-15, 16, 17	HIRS-3 AMSU-A AMSU-B

- Reported data counts for each instrument are sum of all platforms

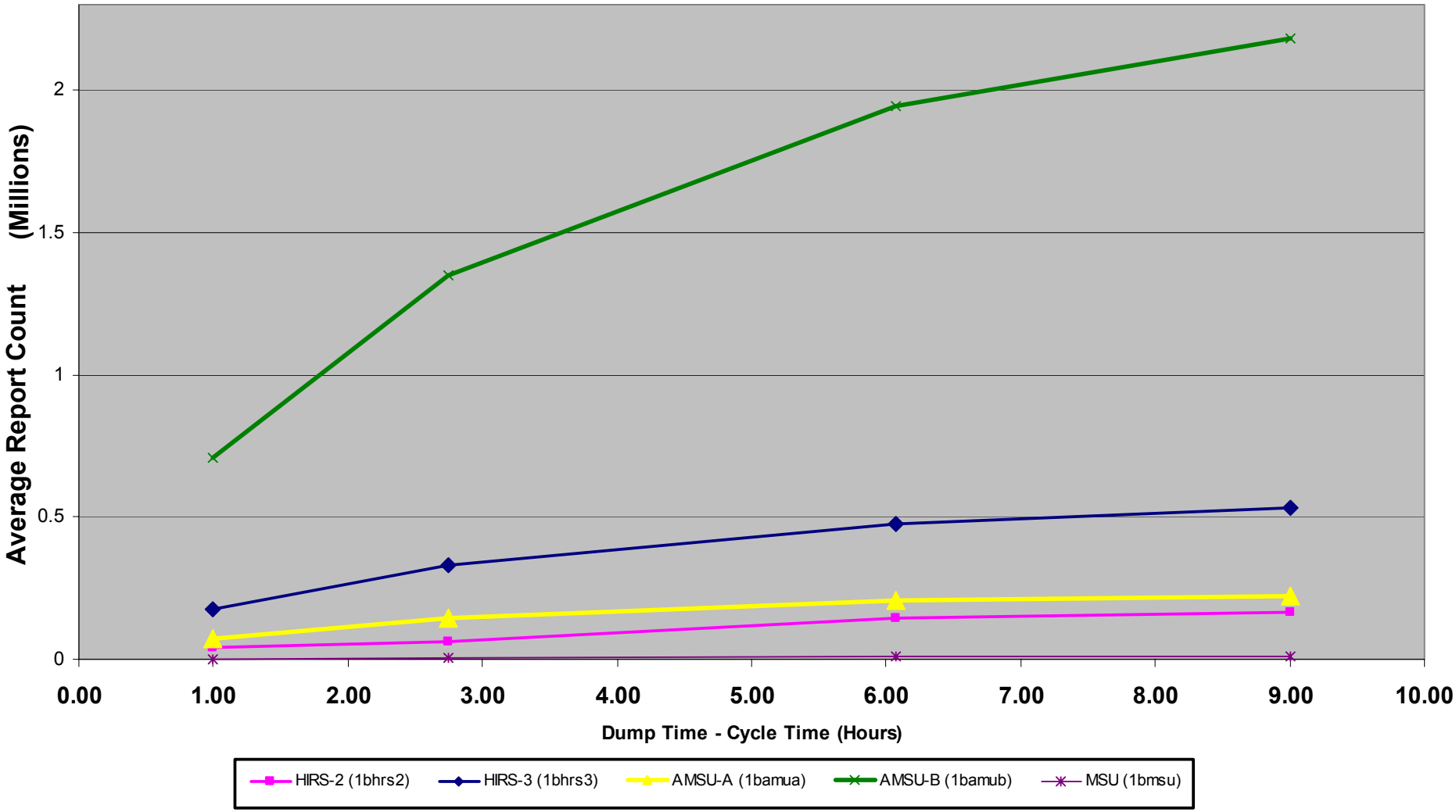
NOAA POES Observations Availability

Data Cutoff Times

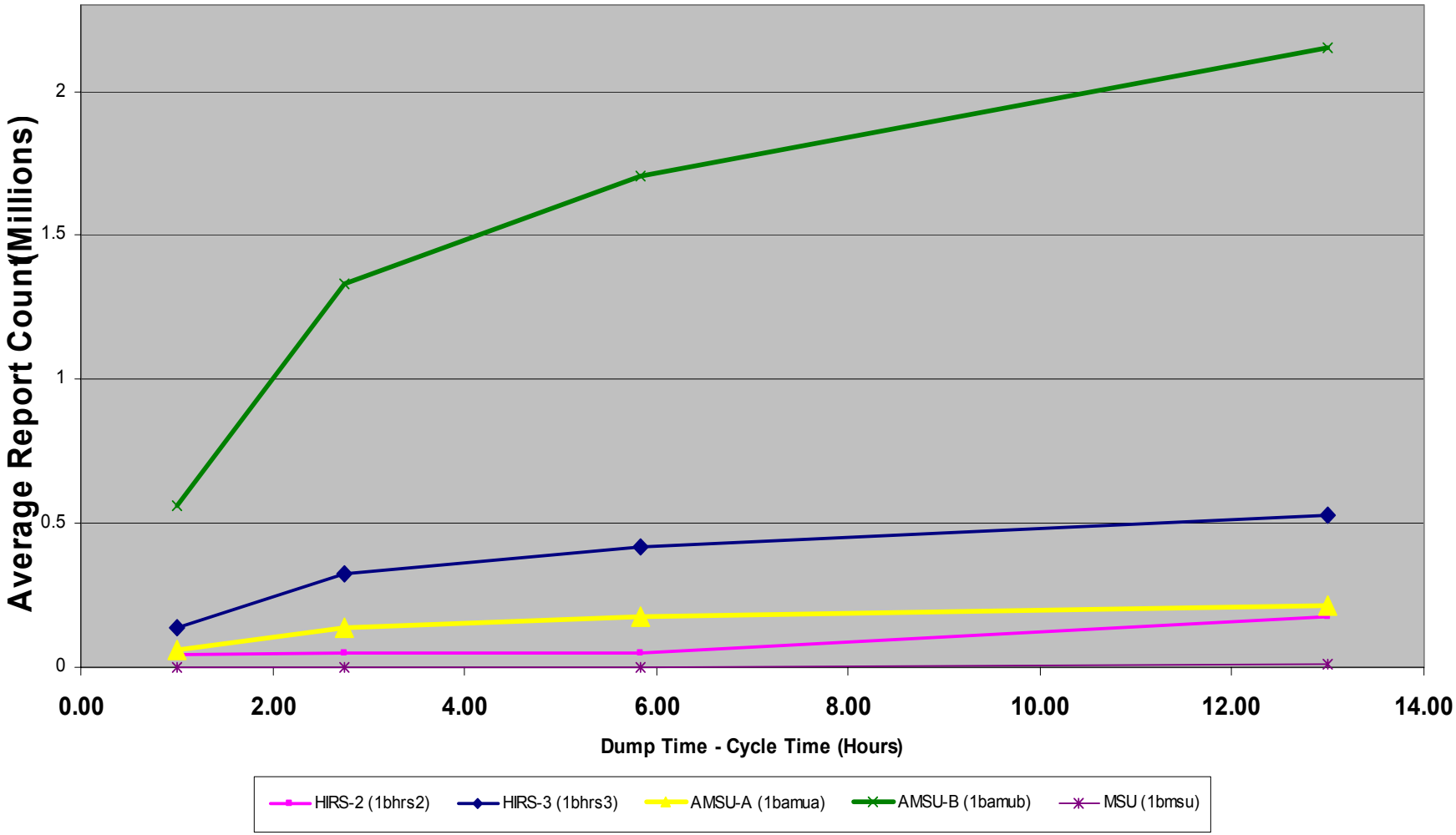
00 UTC	T + 1:00 (Regional) T + 2:45 (GFS Early) T + 6:00 (GFS Late) T + 9:00 (ECMWF)
06 UTC	T + 1:00 T + 2:45 T + 5:50 (GFS Late) T +13:00 (ECMWF)
12 UTC	T + 1:00 T + 2:45 T + 7:15 (ECMWF) T +8:05 (GFS Late)
18 UTC	T +1:00 T + 2:45 T + 5:50 (GFS Late) T + 14:30 (ECMWF)

- Data counts are one month means except T+1:00 & ECMWF (16 days)

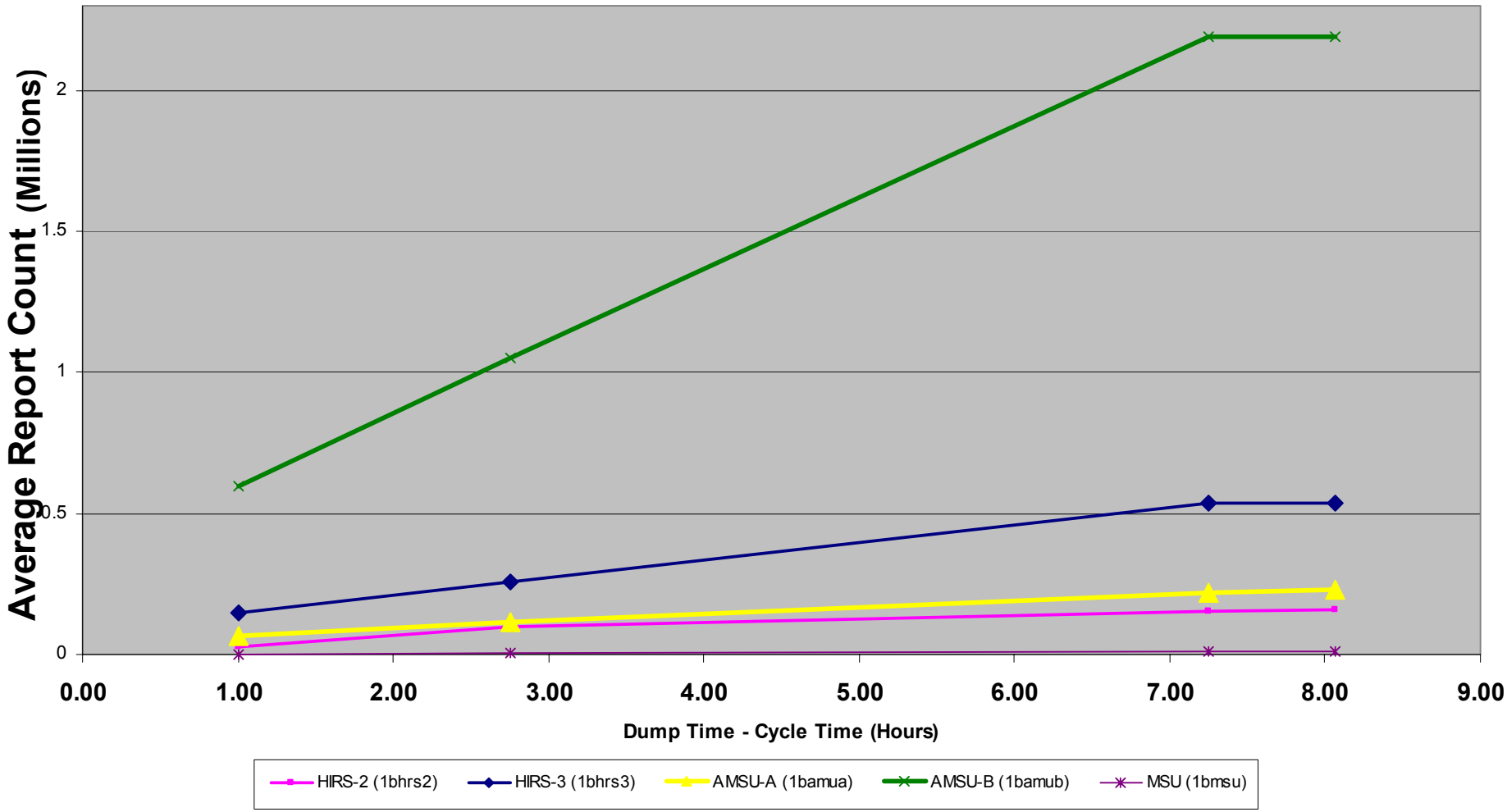
1B Data Counts: 00 UTC



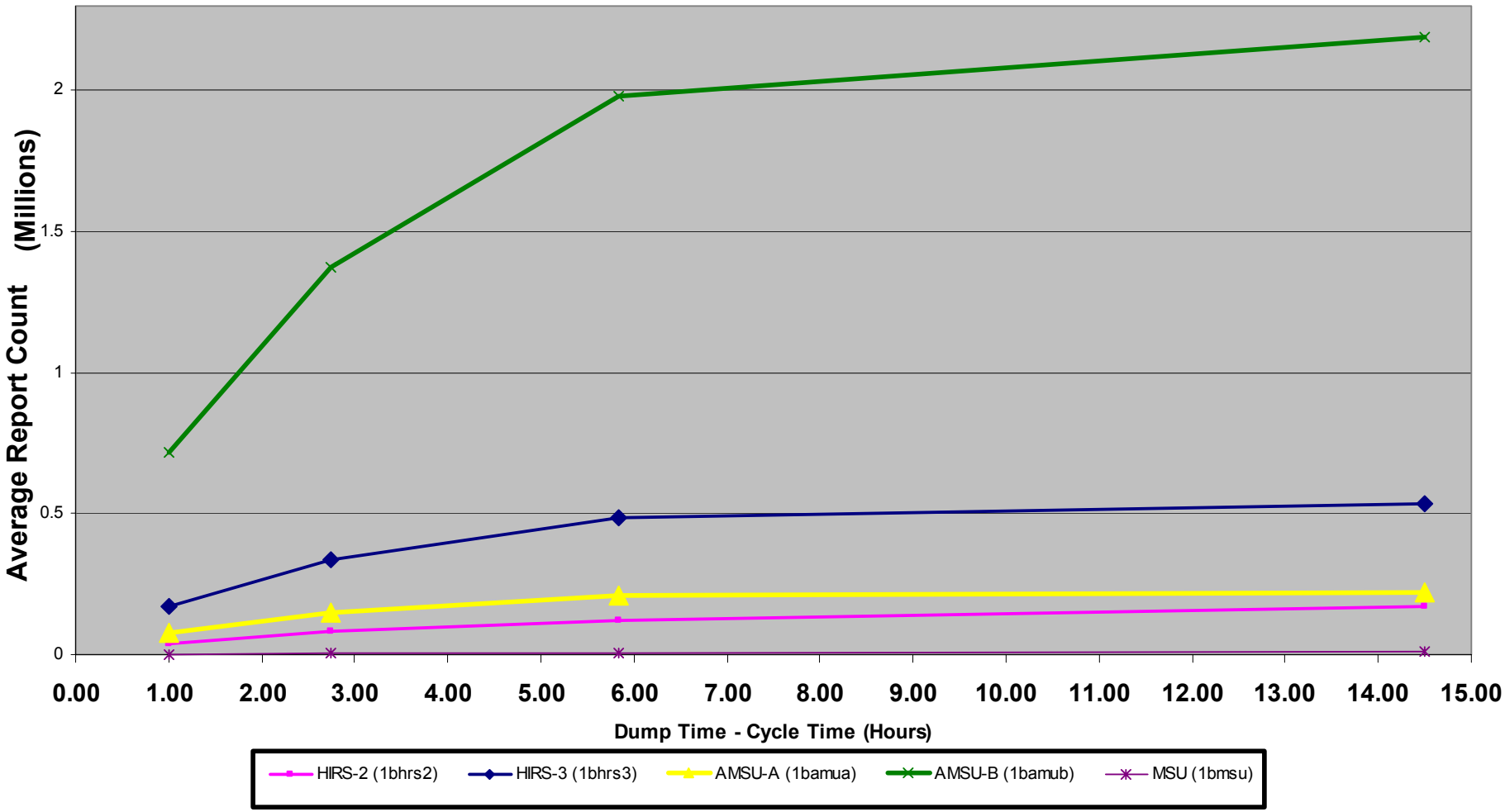
1B Data Counts: 06 UTC



1B Data Counts: 12 UTC



1B Data Counts: 18 UTC



Conclusions

- POES data delivery gives all data at ECMWF cutoff times for all cycles
- Ramp up to total data counts is cycle dependent
  - 12 UTC is slowest delivery and affects NCEP GFS early cycle most
- NCEP GFS
  - Late cycle receives typically 90-95% of ECMWF
  - Early cycle receives typically 70-75% of late cycle
- Regional models affected most due to short data cutoff

Other Factors

- "Blind orbit problem"
  - Delays transmission for all POES instruments at 06 UTC
    - NOAA-15 affected most at 06 UTC
- "Priority" satellite data transmission
  - NOAA-15 deemed lower priority
  - Important due to NOAA-17 AMSU-A demise
- Impact on assimilation system performance untested