

# CERES Data Products

- **Availability**

- What data can I find already processed at the ASDC?
- How long is the delay from satellite acquisition to first products?
- *CERES data products are climate focused: accuracy over speed. So none of the products are “near real time”: quickest appear about 3 months after satellite data acquisition.*
- Which Editions form a consistent end to end set of data?

- **Schedule of Future Data Products**

- Processing rate/delay for products in validated current production
- Processing rate/delay for products in reprocessing.
- Conversion of current Beta quality products to validated Editions
- Schedule for appearance of new Beta products
- Remember: Beta is perishable test data and not for publication, Editions are validated science ready data that are permanently archived (including older versions).

# Schedule for Future Products

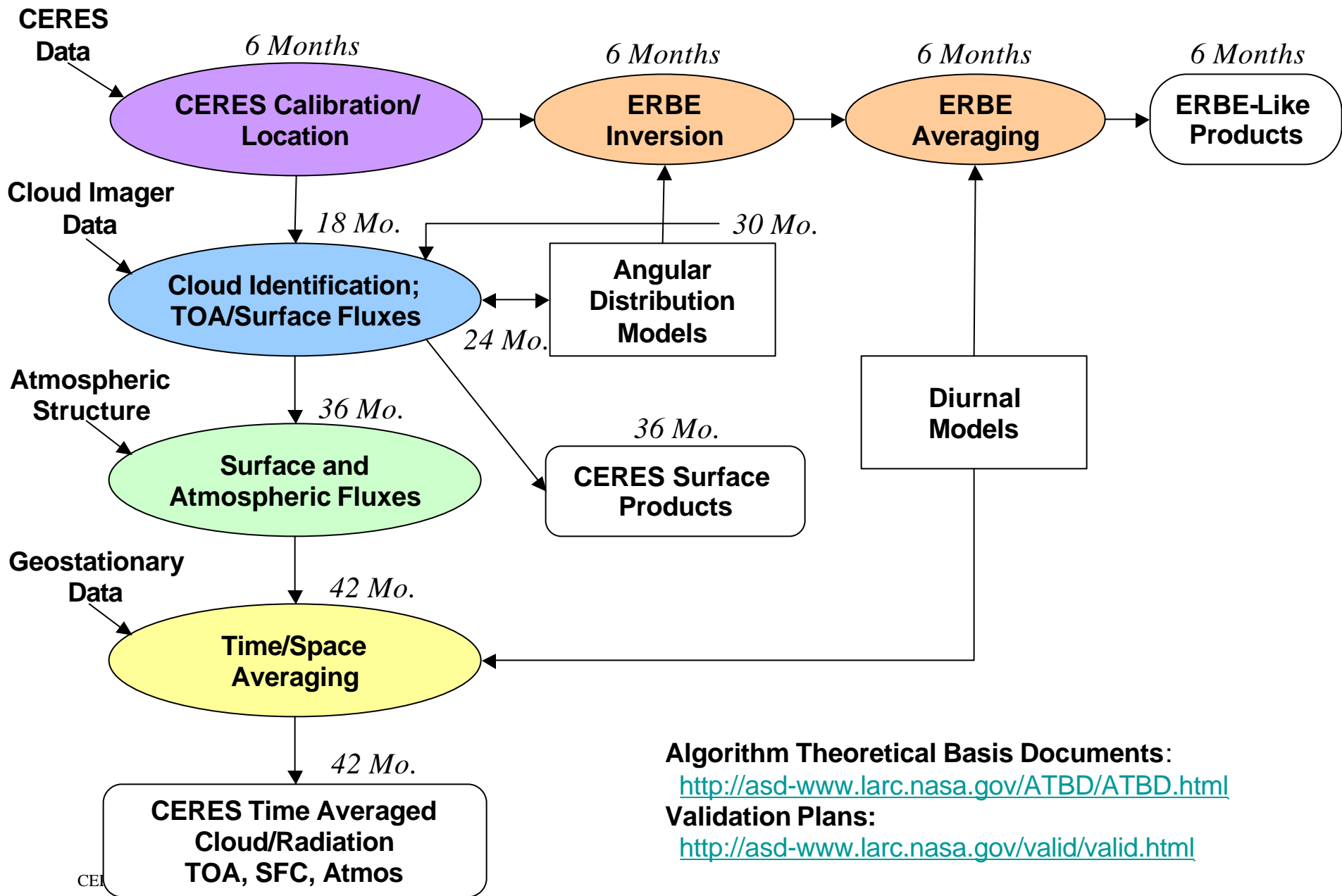
- **Catch-22**

- Software companies usually refuse to predict delivery dates: too many uncertainties. (ERBE did not predict schedules).
- When they do predict release (Windows, games) its usually late.
- Pros: schedules help focus the team, speed production, help users plan their work, especially for proposals like EOS NRA. NASA HQ likes them.
- Cons: can force data products out prematurely resulting in a reprocessing, or products always late, frustrating users. It always seems to take longer than you can predict.

- **What holds things up?**

- Angular Dependence Models (ADMs) require 2 years of sampling.
- Validation requires long time series of surface site comparisons, e.g. ARM.
- Merging data from up to 11 instruments, 7 spacecraft, ECMWF, NOAA snow and ozone data.
- Problems in input data sets: format changes, bad files or data, missing or delayed data.
- Hardware and software problems with the production environment (operating system upgrades, hardware failures, etc).
- NASA does provides funding to get products done: but not to guarantee bullet-proof delivery times, especially for climate data products.

# CERES Data Processing Flow



# The Quick Stuff: Radiances and ERBE-Like

- **TRMM:** BDS Ed1, ES-8 Ed2, ES-4 Ed2, ES-9 Ed2 complete and form a consistent climate data set.
- **Terra:** BDS Ed1 has some instrument drifts.  
BDS Ed2 cleans the drifts up  
BDS, ES-8/4/9 Ed2 are a consistent climate set.  
BDS, ES-8/4/9 Ed2 processed 3/00 to 9/01.  
Remainder should process by 3/03.  
Thereafter, 4 month delay from acquisition.
- **Aqua:** BDS, ES-8/4/9 Ed1 begins 3/03 for FM4  
FM3 instrument still resolving 2 anomalies.  
Expect 3 month delay from acquisition.

# New Generation Products: SSF

- **Merged cloud imager properties and CERES radiances/fluxes.**  
**Two Phases: *before* new ADMs and *after* new ADMs.**
- **TRMM: SSF Ed2B complete. 1/98-8/98 and 3/00.**
- **Terra: SSF Ed1 processing to develop 2 yrs ADM data**  
**Uses TRMM ADMs: ok for 40S to 40N.**  
**3/00-6/00 and 11/00-9/01 available now**  
**7/00-8/00 and 10/01-2/02 by 3/03**  
**Fill in remaining months at ~ 4X reprocessing.**  
**Terra global ADMs expected to complete 9/03.**  
**Ed2 SSF with new ADMs/fluxes starts 11/03.**  
**Reprocessing is at about 30X.**
- **Aqua: Beta starts 3/03. Will run seasonal months first.**  
**Ed1 starts 11/03 and uses Terra ADMs.**  
**2 years of Ed1 processed for ADMs by 10/04,**  
**ADMs complete 4/05, Ed2 reprocessing with**  
**new ADM fluxes starts 6/05 and reprocesses at 30X.**

# New Generation Products: CRS

- **Uses SSF Fluxes with new ADMs as input.**
- **TRMM: CRS Ed2B complete. 1/98-8/98 and 3/00.  
HDF formatting bug: TOA fluxes left off.  
CRS Ed2C fix/process by 3/03 for all months.**
- **Terra: Beta available 3/03. seasonal months run first.  
Ed2 validated after ADMs and SSF Ed2: 3/04.  
Reprocessing occurs at about 5X.**
- **Aqua: Beta available 8/03.  
Ed2 validated after ADMs and SSF Ed2: 10/05.  
Reprocessing occurs at about 5X.**

***May be possible to accelerate the Aqua schedule depending on performance of Terra ADMs applied to Aqua data. This will not be known until ~11/03 following completion of Terra ADMs.***

# New Generation Products: SFC and FSW

- 1 degree gridded versions of SSF and CRS
- **TRMM:**           SFC Ed2B complete  
                  FSW Ed2C complete by 3/03 using CRS Ed2C.
- **Terra:**           SFC Beta by 2/03.           FSW Beta by 3/03.  
                  SFC Ed2 by 2/04.       FSW Ed2 by 4/04.  
                  Reprocessing at 10X.
- **Aqua:**           SFC Beta 4/03.           FSW Beta 9/03  
                  SFC Ed2 by 9/05.       FSW Ed2 by 11/05.  
                  Reprocessing at 10X.

*May be possible to accelerate the Aqua schedule depending on performance of Terra ADMs applied to Aqua data. This will not be known until ~11/03 following completion of Terra ADMs.*

# New Generation Products: SRBAVG

- **Requires ADMs and new SSF Edition 2 TOA fluxes to derive directional models: albedo vs solar zenith angle for all ADM scene types. Appears several months after ADMs.**
- **Corrects CERES diurnal cycles using geostationary 3-hrly.**
  
- **TRMM: Ed2B complete**
  
- **Terra: Beta by 3/03.  
Ed2 by 3/04. Reprocessing at 10X.**
  
- **Aqua: Beta by 6/03.  
Ed2 by 10/05 following completion of Aqua ADMs and directional models (DMs).  
Reprocessing at 10X.**

***May be possible to accelerate the Aqua schedule depending on performance of Terra ADMs applied to Aqua data. This will not be known until ~11/03 following completion of Terra ADMs.***



# New Generation Products: SYN and AVG

- **3-hourly Synoptic, daily, monthly data based on CRS input with geostationary data used for diurnal cycle. Reprocessing speeds are expected to be better than 5X, but are still TBD.**
- **TRMM:            SYN Beta by 5/03,            AVG Beta by 8/03.  
                      SYN Ed2C by 9/03,            AVG Ed2C by 10/03.**
- **Terra:            SYN Beta by 6/03,            AVG Beta by 9/03.  
                      SYN Ed2C by 7/04,            AVG Ed2C by 9/04.**
- **Aqua:            SYN Beta by 10/03,            AVG Beta by 11/03.  
                      SYN Ed2C by 2/06,            AVG Ed2C by 4/06.**

***May be possible to accelerate the Aqua schedule depending on performance of Terra ADMs applied to Aqua data. This will not be known until ~11/03 following completion of Terra ADMs.***

## CERES Data Product Availability and Schedule

Description	Lvl	Product Name	TRMM Mission	TRMM Data Available	Terra Mission	Terra Data Available
<b>Radiances</b>	<b>1</b>	<b>BDS</b>	Ed1	1/98-8/98; 3/00	Ed1 Ed2	3/00-11/02 3/00-9/01
<b>ERBE-Like TOA</b>	<b>2</b>	<b>ES-8</b>	Ed2	1/98-8/98; 3/00	Ed1 Ed2	3/00-11/02 3/00-9/01
<b>ERBE-Like TOA</b>	<b>3</b>	<b>ES-4,9</b>	Ed2	1/98-8/98; 3/00	Ed1 Ed2	3/00-11/02 3/00-9/01
<b>Cloud/Radiance ADMs</b>	<b>2</b>	<b>SSF</b>	Ed2B	1/98-8/98; 3/00	Ed1	3/00-6/00; 11/00-9/01
<b>Cloud/TOA Flux</b>	<b>4</b>	<b>ADMs</b>	Yes	9 mo. composite	<i>beta 6/03, validated 9/03 beta 7/03, Ed2 11/03 beta 11/03, Ed2 1/04 beta 2/03, Ed2 2/04 beta 3/03, Ed2 3/04 beta 2/03, Ed2 3/04 beta 3/03, Ed2 4/04 beta 6/03, Ed2 7/04 beta 9/03, Ed2 9/04</i>	
<b>Solar Zenith Dep</b>	<b>4</b>	<b>DMs</b>	Yes	9 mo. composite		
<b>Gridded SSF</b>	<b>3</b>	<b>SFC</b>	Ed2B	1/98-8/98; 3/00		
<b>Monthly Gridded TOA/Sfc/Atmos</b>	<b>3</b>	<b>SRBAVG</b>	Ed2B	1/98-8/98; 3/00		
<b>Gridded CRS</b>	<b>2</b>	<b>CRS</b>	Ed2B	Ed2C in 3/03		
<b>Synoptic Fluxes</b>	<b>3</b>	<b>FSW</b>	<i>Ed2C in 3/03</i>			
<b>Daily/Monthly</b>	<b>3</b>	<b>SYN</b>	<i>beta 5/03, Ed2C 9/03</i>			
	<b>3</b>	<b>AVG</b>	<i>beta 8/03, Ed2C 10/03</i>			

*Notes:*

- 1) Beta data starts with sample testing seasonal months, later processes one to two years.
- 2) All data products delivered for public use with a Data Quality Summary
- 3) TRMM data also available for selected field experiments in 1999 (INDOEX)
- 4) Terra diurnal sampling biases an issue until SRBAVG and AVG products available.
- 5) Once the validated Edition data is available for a product, reprocessing as rapid as possible
- 6) Slowest reprocessing rates are SSF Ed1 (~5X), CRS (~5X): others 10X or faster.
- 7) Current best estimates of delivery dates: subject to funding levels, unanticipated instrument or processing/algorithm issues.

## CERES Data Product Availability and Schedule

Description	Lvl	Product Name	Aqua Mission
<b>Radiances</b>	<b>1</b>	<b>BDS</b>	<i>Ed1 in 2/03 for FM4 (FM3 still in testing)</i>
<b>ERBE-Like TOA</b>	<b>2</b>	<b>ES-8</b>	<i>Ed1 in 2/03 for FM4 (FM3 still in testing)</i>
<b>ERBE-Like TOA</b>	<b>3</b>	<b>ES-4,9</b>	<i>Ed1 in 2/03 for FM4 (FM3 still in testing)</i>
<b>Cloud/Radiance ADMs</b>	<b>2</b>	<b>SSF</b>	<i>beta in 3/03, Ed1 in 11/03</i>
<b>Cloud/TOA Flux</b>	<b>4</b>	<b>ADMs</b>	<i>beta in 10/04, validated 4/05</i>
<b>Solar Zenith Dep</b>	<b>2</b>	<b>SSF</b>	<i>beta in 3/03, Ed2 in 6/05</i>
<b>Gridded SSF</b>	<b>4</b>	<b>DMs</b>	<i>beta in 3/05, Ed2 in 8/05</i>
<b>Monthly Gridded TOA/Sfc/Atmos</b>	<b>3</b>	<b>SFC</b>	<i>beta in 4/03, Ed2 in 9/05</i>
<b>Gridded CRS</b>	<b>3</b>	<b>SRBAVG</b>	<i>beta in 6/03 Ed2 in 10/05</i>
<b>Synoptic Fluxes</b>	<b>2</b>	<b>CRS</b>	<i>beta in 8/03 Ed2 in 10/05</i>
<b>Daily/Monthly</b>	<b>3</b>	<b>FSW</b>	<i>beta in 9/03 Ed2 in 11/05</i>
	<b>3</b>	<b>SYN</b>	<i>beta in 10/03, Ed2 in 2/06</i>
	<b>3</b>	<b>AVG</b>	<i>beta in 11/03, Ed2 in 4/06</i>

### Notes:

- 1) Beta data starts with sample testing seasonal months, later processes one to two years.
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- 4) Once the validated Edition data is available for a product, reprocessing as rapid as possible
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- 6) Current best estimates of delivery dates: subject to funding levels, unanticipated instrument or processing/algorithm issues.

# Schedule Disclaimer

***These schedules are a current rough estimate done specifically for the data workshop. They will be worked more thoroughly as part of the EOS NRA process over the next several months. The intent is to give rough estimates that can guide future planning and use of the data products. Think of these as rough 50% probability schedules. If you need to know with 90% confidence that data will be available: add a 30% contingency to the schedule.***