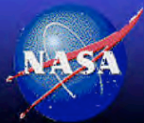# Time-averaged Computed, ATM, and SFC Flux Products (SYN/AVG/ZAVG) Beta-to-Edition Roadmap

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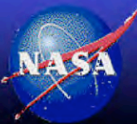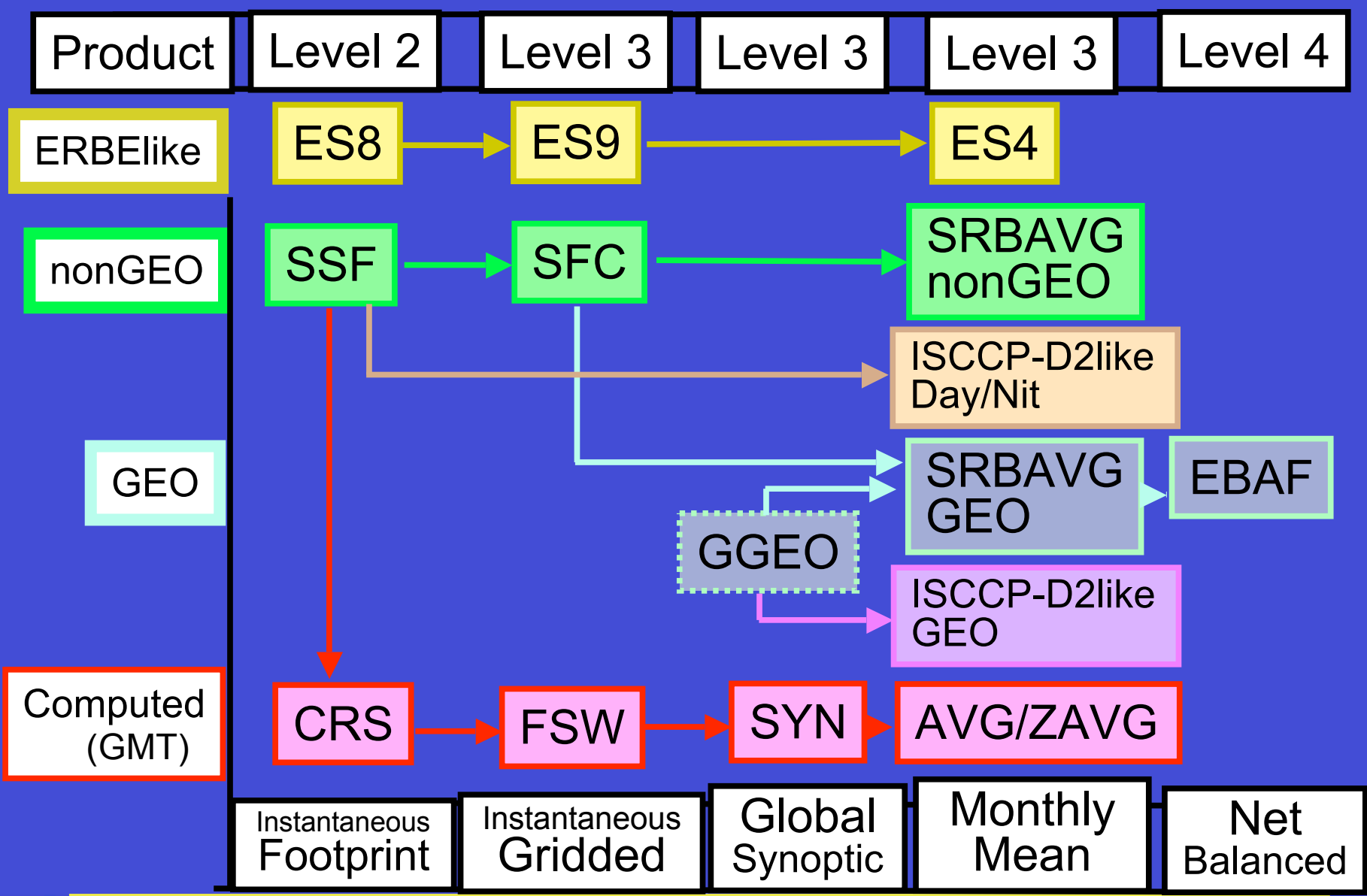
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# CERES Time-averaged Flux Product Objectives

- ES-4 ERBE-like product
  - Similar algorithms to the ERBE product
  - Near real time release
- SSF/SFC/SRBAVG-nonGEO product
  - Best TOA instantaneous (footprint/gridded) flux
  - Based on extensive ADMs constructed from RAPS scan mode SSF radiances and MODIS clouds
- SRBAVG GEO product
  - The most robust time-averaged TOA fluxes
  - Incorporates GEO derived BB fluxes to complete diurnal cycle
- EBAF product, removes the net imbalance in the GEO product
  - Set to the ocean heat storage term constrained within CERES calibration uncertainty
- SYN/AVG/ZAVG product
  - The most consistent cloud and flux product tuned to the CERES TOA calibration - for comparison with GCMs
  - The best surface and atmospheric fluxes available
  - Uses GEO product TOA fluxes and clouds, GSFC GEOS-4 reanalysis atmosphere, MODIS and MATCH aerosols in the Fu-Liou flux computations

Product	Level 2	Level 3	Level 3	Level 3	Level 4
ERBElike	ES8	ES9		ES4	
nonGEO	SSF	SFC		SRBAVG nonGEO	
			ISCCP-D2like Day/Nit		
GEO				SRBAVG GEO	EBAF
			GGEO		
				ISCCP-D2like GEO	
Computed (GMT)	CRS	FSW	SYN	AVG/ZAVG	

Instantaneous Footprint	Instantaneous Gridded	Global Synoptic	Monthly Mean	Net Balanced

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SYN/AVG/ZAVG Development

Version	Release	Processed	Highlights	Cautions
Beta1/ Beta2	Oct06		99.5% Computed flux success	Noted computed flux differences between GEO and MODIS clouds
Beta3	Apr07	Terra Mar00-Oct04	EOF revealed no computed flux trending compared with nonGEO	Missing ancillary file stopped processing
Beta4/5	Jul08	Terra & Aqua seasonal months and single year	Integrated hourly SZA's computed, SYN/AVG/ZAVG processing reduced from 3 to 1 day/month	Nested grid error and GEOS4 read error corrected
Edition	Apr09	Terra and Aqua record	Finalize Validation and Deliver code	
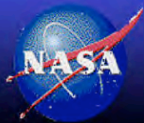
SYN/AVG/ZAVG Deadlines

- NASA Terra/Aqua Senior Review due April 2009
  - Determines future CERES funding
  - Helpful to have SYN/AVG/ZAVG Edition

- What is the validation status to assure climate quality computed fluxes?
  - Validation summary and schedule to be laid out

- What are the time constraints at the DAAC to begin processing an Edition by April 2009?
  - Code delivery, testing, processing to be outlined
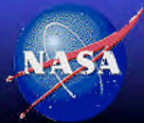
SYN/AVG/ZAVG validation strategy

- The big issue is GEO clouds, which have been determined to be different then MODIS clouds, when used to compute radiative transfer fluxes
  - GEO clouds are based on a VIS and IR retrievals, whereas MODIS is based on superior multi-channel retrievals
  - However is the diurnal information in GEO clouds sufficient enough to compute more accurate fluxes then MODIS temporally interpolated cloud properties.
  - Are the GEO clouds devoid of artifacts and systematic biases?
  - Are the SYN/AVG/ZAVG fluxes of climate quality

SYN/AVG/ZAVG Validation Summary

Truth dataset	Validation	SW	LW
Cave surface flux comparisons	Comparison with other datasets ISCCP, SRB, ModelB		
	Deseasonalized trends, GEO artifacts		
	Tuning at TOA improvement		
	GEO clouds computed flux improvement over MODIS interpolated		
	Improvement of Tuned fluxes with GEO flux using MODIS-only clouds		
	Increased GEO computed flux improvement near sunrise/sunset flux		
	UV index and PAR comparison		
Terra-based fluxes compared with Aqua TOA 1:30 PM observed	GEO cloud computed fluxes similar to TOA temporal interpolated fluxes		
	GEO clouds computed SFC flux improvement over MODIS interpolated compared with Aqua clouds		
Beta4	TOA Untuned – Observed flux consistency Clouds and fluxes are consistent		
SeaWifs PAR	Compare untuned PAR flux		
NCAR/NCEP	Net atmosphere flux comparison		
EOF	Any GEO artificacts		
GERB diurnal	Computed TOA fluxes diurnally consistent		

Validation Outcome

Improvement	(green)
Neutral	(yellow-green)
Caution - DQS	(yellow)
Show Stopper	(red)

Validation and Processing Schedule

Nov08	Dec08	Jan09	Feb09	Mar09	Apr09	Aug09
Initial Validation Promising		Validation Completed		Validation summarized in DQS		
Code Delivery	Code testing	Process Test months	Evaluate Test months		Begin Edition processing	Finish Production
Today Initial Consensus		Final Edition Approval			Process speed of 1 day/month of 104 months	

- This schedule does not allow for any algorithm improvements
    - hand in current corrected code
    - Further science improvements to wait until Edition3
- Beta3 has been publicly available for over a year and only minor improvements have been implemented since
    - voice concerns now

SYN/AVG/ZAVG Edition Plans

- Today initial consensus
  - Fred and I to discuss initial validation
  - Discussion of results to continue edition plans
- Complete validation in January 2009 for distribution to science team members for evaluation
- Late January 2009 telecon for final edition approval
- SYN/AVG/ZAVG Edition processing begins Apr09
- SYN/AVG/ZAVG Edition Mar00 - Oct05 processing complete for the Terra Aqua records in Aug09