Leaf Area Index (LAI) and Fraction of Absorbed Photosynthetically Active Radiation (FAPAR) CDR

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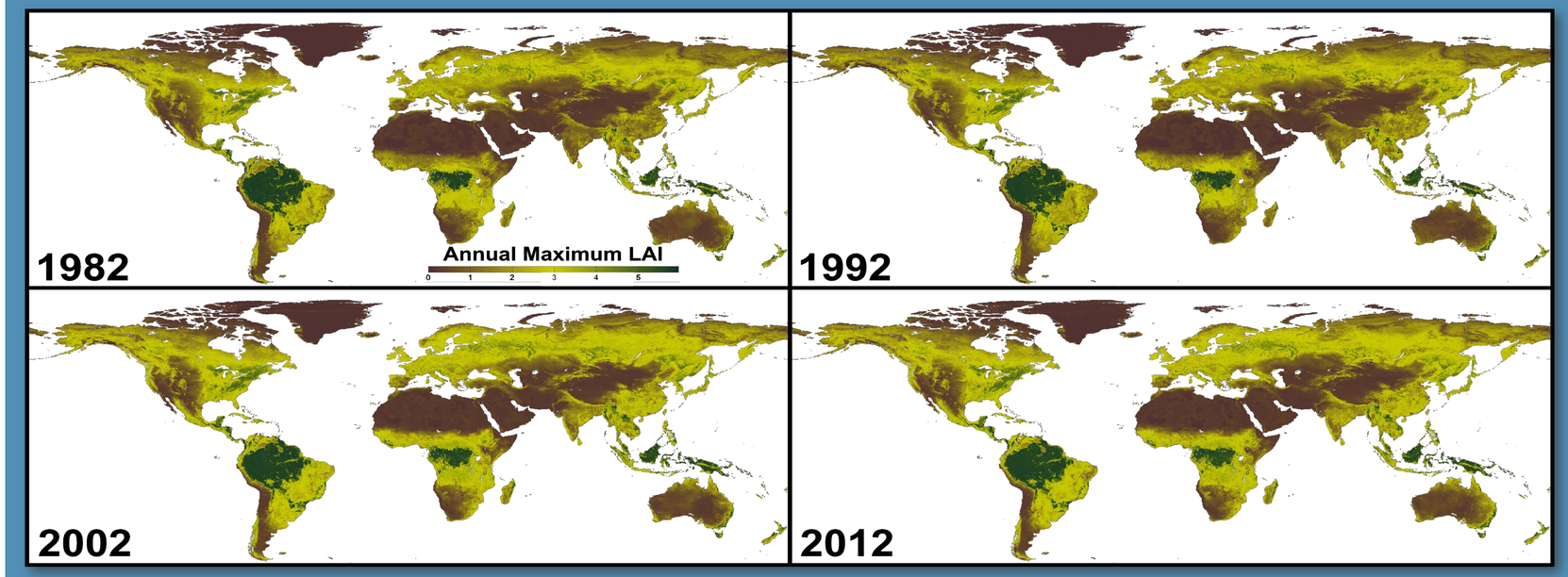
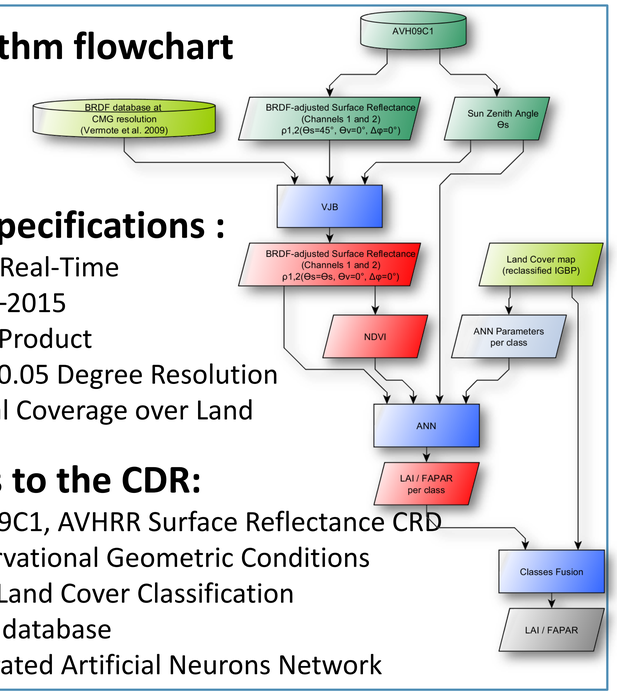
CDR Images



CDR Description

Algorithm flowchart



CDR Specifications :

- Near-Real-Time
- 1981–2015
- Daily Product
- 0.05x0.05 Degree Resolution
- Global Coverage over Land

Inputs to the CDR:

- AVH09C1, AVHRR Surface Reflectance CRD
- Observational Geometric Conditions
- IGBP Land Cover Classification
- BRDF database
- Calibrated Artificial Neurons Network

ANN Calibration

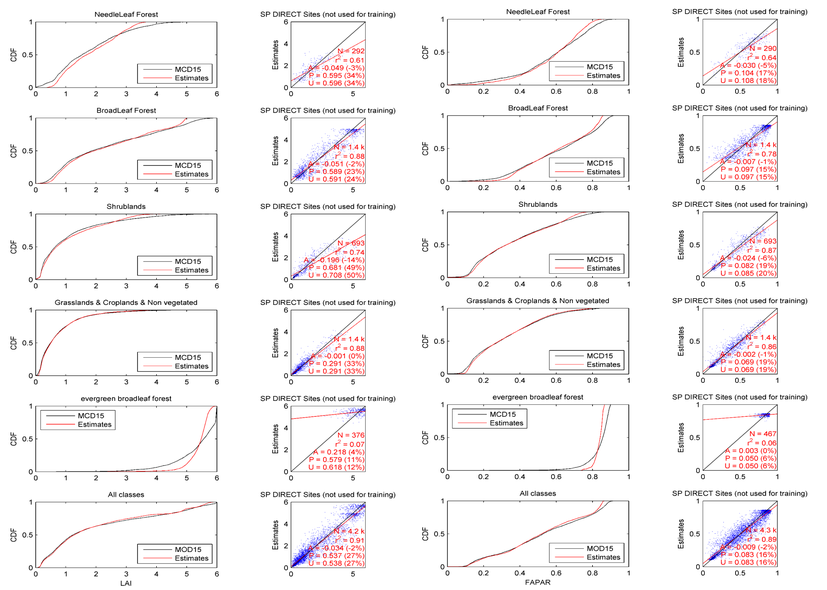


Fig. 1. Theoretical performances of the LAI (left) and FAPAR (right) retrieval.

CDR Validation

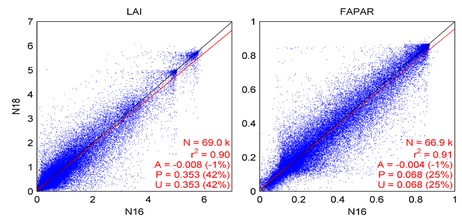
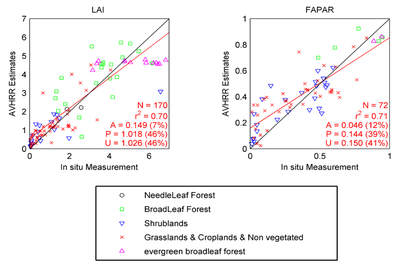


Fig. 2. NOAA16 vs NOAA18 retrievals comparison

Fig. 3. In situ validation using the DIRECT network



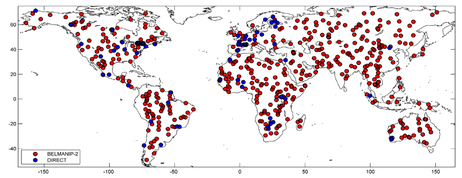


Fig. 4. BELMANIP-2 and DIRECT network sites location

Class	LAI				FAPAR			
	A	P	U	N	A	P	U	N
NeedleLeaf Forest	-0.04	0.44	0.31	2				0
BroadLeaf Forest	0.39	1.15	1.18	22	0.07	0.15	0.15	5
Shrublands	0.02	0.96	0.93	20	0.04	0.13	0.13	25
Grasslands & Croplands & Non vegetated	0.11	0.69	0.69	51	0.05	0.15	0.16	40
evergreen broadleaf forest	-0.81	1.35	1.53	14	-0.07	0.02	0.07	2
All	0.13	1.04	1.05	171	0.05	0.14	0.15	72

Future Improvements

- Use of a single ANN rather than a per-class ANN

Potential Applications:

- Agriculture Monitoring
- Drought impact detection
- Phenology detection
- Climate models assimilation
- Detecting long-term trend of vegetation structure