ASTER Cal/Val Test Sites

Site Name	Type	Working Group	Site Cog I	lat/lon	Participating institutions and team members	Algorithm val site?
* see data sheets for additional information						
Iowa corn belt		Geometric Cal	H. Kieffer	43.2 N / 95.6 W	H. Kieffer, Bryan Bailey	Yes
Moon		Geometric Cal	H. Kieffer	n/a	H. Kieffer, NAU/USGS Lunar Photometry program	no
San Francisco Bay		Geometric Cal	H. Kieffer	37.8 N /122.3 W	H. Kieffer	No
Texas Test Range - TBD - classified site		Geometric Cal	H. Kieffer			
Brainard, Minnesota or Blair, Nebraska		Geometric Cal	H. Kieffer	46.4 N 94.0 W or 41.5 N / 96.2 4	H. Kieffer, Bryan Bailey	Yes
10 deg. lat spaced sites:						
- Central angle: 90 Nominal Latitude: 81.70: Franz Josef Land (former USSR)		Geometric Cal	H. Kieffer	81 N, 57 E (Path 199, Row 1)	H. Kieffer	Yes
- Central angle: 100 Nominal Latitude: 77.03: Svalbard		Geometric Cal	H. Kieffer	77.0 N, 16.5 E (Path 210, Row 5)	H. Kieffer	Yes
- Central angle: 110 Nominal Latitude: 68.41: Northern Norwegian Islands		Geometric Cal	H. Kieffer	68.4 N, 15.3 E (Path 199, Row 12)	H. Kieffer	Yes
- Central angle: 120 Nominal Latitude: 58.98: Alaskan coast		Geometric Cal	H. Kieffer	58.9 N, 136.5 W (Path 59, Row 19)	H. Kieffer	Yes
- Central angle: 130 Nominal Latitude: 49.29 (ALTERNATIVE): Paris		Geometric Cal	H. Kieffer	49.0 N, 1.9 E (Path 199, Row 26)	H. Kieffer	Yes
- Central angle: 130 Nominal Latitude: 49.29 (ALTERNATIVE): NW Washington State		Geometric Cal	H. Kieffer	49.0 N, 122.8 W (Path 47, Row 26)	H. Kieffer	Yes
- Central angle: 140 Nominal Latitude: 39.50: Aegean Sea Islands (Santorini Island?)		Geometric Cal	H. Kieffer	36.7 N, 24.4 E (Path 182, Row 34 1/2)	H. Kieffer	Yes
- Central angle: 150 Nominal Latitude: 29.65 (ALTERNATIVE): Inland Sea Islands, Japan		Geometric Cal	H. Kieffer	34.5 N, 133.45 E (Path 111, Row 36 1/4)	H. Kieffer	Yes

ASTER Cal/Val Test Sites

Site Name	Algorithm	Site Description	ASTER test site	Objectives	Site Accessibility	Minimum Site size	Extended Site size
* see data sheets for additional information							
Iowa corn belt	Level-1 Geometry	Farm land with 1-mile grid "farm-to-market" road system.	ASTER, yes. Other, no.	Verify geometric calibration files	Road, easy	60 x 60 km	185 x 185 km
Moon		Airless large natural satellite. Sharp edges against zero background radiance.	Yes. Other?: MODIS, MISR	Radiometric stability; characterize geometric response functions.	None	2 degree strip	2 degree strip
San Francisco Bay	Level-1 Geometry	Several large bridges over water, airports, shipyards; salt ponds	No	characterize geometric response functions.	Raod, easy	20 - 35 km	30 x 50 km
Texas Test Range - TBD - classified site							
Brainard, Minnesota or Blair, Nebraska	Level-1 Geometry	Farmland, 374 km along-track (stereo separation) from Iowa site	ASTER, yes. Other, no.	Verify geometric calibration files; Determine Aft stereo angle	Raod, easy	20 km, downtrack	N/A
10 deg. lat spaced sites:							
- Central angle: 90 Nominal Latitude: 81.70: Franz Josef Land (former USSR)	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 100 Nominal Latitude: 77.03: Svalbard	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 110 Nominal Latitude: 68.41: Northern Norwegian Islands	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 120 Nominal Latitude: 58.98: Alaskan coast	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 130 Nominal Latitude: 49.29 (ALTERNATIVE): Paris	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 130 Nominal Latitude: 49.29 (ALTERNATIVE): NW Washington State	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 140 Nominal Latitude: 39.50: Aegean Sea Islands (Santorini Island?)	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 150 Nominal Latitude: 29.65 (ALTERNATIVE): Inland Sea Islands, Japan	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)

ASTER Cal/Val Test Sites

Site Name	Site Occupation	Elevation	Surface Cover Type	Climate	Nearest Weather Station	Available data
* see data sheets for additional information						
Iowa corn belt	native population; no instrumentation	300-500 m	crops to mixed second-growth forest	typical US central plains		Maps
Moon	none	n/a; see CAM descriptions	lunar soil and highlands	none	384,000 km	Lunar photometric model being developed
San Francisco Bay	native population; no instrumentation	0 - 300 m	urban & rural; ocean & inland waters	coastal marine; fog common in winter	several within area	Maps, aerial photos, engineering drawing of bridges
Texas Test Range - TBD - classified site						
Brainard, Minnesota or Blair, Nebraska	native population; no instrumentation	200 or approx 400 m	crops	midland continental. require no snow.		Maps
10 deg. lat spaced sites:						
- Central angle: 90 Nominal Latitude: 81.70: Franz Josef Land (former USSR)	native population; no instrumentation.	0	open water, land (exposed in Boreal Autumn only)			Maps
- Central angle: 100 Nominal Latitude: 77.03: Svalbard	native population; no instrumentation.	0	open water, land (exposed in Boreal Autumn only)			Maps
- Central angle: 110 Nominal Latitude: 68.41: Northern Norwegian Islands	native population; no instrumentation.	0	open water, land (exposed in Boreal Autumn only)			Maps
- Central angle: 120 Nominal Latitude: 58.98: Alaskan coast	native population; no instrumentation.	0	open water, land (exposed in Boreal Autumn only)			Maps
- Central angle: 130 Nominal Latitude: 49.29 (ALTERNATIVE): Paris	native population; no instrumentation.	approx 100 m	land, river, roads			Maps
- Central angle: 130 Nominal Latitude: 49.29 (ALTERNATIVE): NW Washington State	native population; no instrumentation.	0	open water, land (exposed in Boreal Autumn only)			Maps
- Central angle: 140 Nominal Latitude: 39.50: Aegean Sea Islands (Santorini Island?)	native population; no instrumentation.	0	open water, land			Maps
- Central angle: 150 Nominal Latitude: 29.65 (ALTERNATIVE): Inland Sea Islands, Japan	native population; no instrumentation.	0	open water, land			Maps

ASTER Cal/Val Test Sites

Site Name	Field equipment Measurement accuracy	Observation Requirement	Data processing requirements	Key words	Attachments	Cog I Planned Measurements
* see data sheets for additional information						
Iowa corn belt	Differential GPS; 2 meter accuracy.	preflight: extensive GPS survey In-flight: Early VNIR & SWIR & TIR	Normal Level 1A & Level 1B.	Geometry, spatial response, registration		Existing Large scale Maps; yes -- Aerial Photography; partial, being acquired -- GPS or ground survey; partial, being acquired
Moon	Lunar observatory; 2% radiometry	Continuing Lunar photometric program In-flight: VNIR & SWIR during CAM at 6 month intervals.	Normal Level 1A & Level 1B.	Geometry, Radiometry, calibration, spatial response, registration.		Long-term ground-based telescopic photometry program leading to lunar photometric model
San Francisco Bay	Differential GPS; 2 meter accuracy.	preflight: info from Cal. Dept. of Trans. In-flight: Early VNIR & SWIR & TIR	Normal Level 1A & Level 1B.	Geometry, spatial response, registration		Existing Large scale Maps: yes Aerial Photography: yes GPS or ground survey: existing
Texas Test Range - TBD - classified site						
Brainard, Minnesota or Blair, Nebraska	Differential GPS; 2 meter accuracy	preflight: GPS survey In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B.	Geometry, stereo, DEM		Maps: yes Aerial Photography: yes GPS or ground survey: yes
10 deg. lat spaced sites:						
- Central angle: 90 Nominal Latitude: 81.70: Franz Josef Land (former USSR)	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 100 Nominal Latitude: 77.03: Svalbard	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 110 Nominal Latitude: 68.41: Northern Norwegian Islands	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 120 Nominal Latitude: 58.98: Alaskan coast	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 130 Nominal Latitude: 49.29 (ALTERNATIVE): Paris	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 130 Nominal Latitude: 49.29 (ALTERNATIVE): NW Washington State	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 140 Nominal Latitude: 39.50: Aegean Sea Islands (Santorini Island?)	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 150 Nominal Latitude: 29.65 (ALTERNATIVE): Inland Sea Islands, Japan	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps

ASTER Cal/Val Test Sites

Site Name	Type	Working Group	Site Cog I	lat/lon	Participating institutions and team members	Algorithm val site?
- Central angle: 150 Nominal Latitude: 29.65 (ALTERNATIVE): W. coast of Florida		Geometric Cal	H. Kieffer	28.9 N, 82.7 W (Path 117, Row 40)	H. Kieffer	Yes
- Central angle: 150 Nominal Latitude: 29.65 (ALTERNATIVE): Midway Island		Geometric Cal	H. Kieffer	28.3 N, 177.3 W (Path 178, Row 40 1/2)	H. Kieffer	Yes
- Central angle: 160 Nominal Latitude: 19.78 (ALTERNATIVE): Hawaii		Geometric Cal	H. Kieffer	20.0 N, 155.9 W (Path 63, Row 46)	H. Kieffer	Yes
- Central angle: 160 Nominal Latitude: 19.78 (ALTERNATIVE): Phillipine Island		Geometric Cal	H. Kieffer	18.8 N, 121.85 W (Path 116, Row 47)	H. Kieffer	Yes
- Central angle: 170 Nominal Latitude: 9.89: E. coast of Malaysia		Geometric Cal	H. Kieffer	4.3 N, 118.6 E (Path 116, Row 57)	H. Kieffer	Yes
- Central angle: 180 Nominal Latitude: 0.00: S. of Singapore		Geometric Cal	H. Kieffer	0.9 N, 104.0 E (Path 125, Row 59 1/2)	H. Kieffer	Yes
- Central angle: 190 Nominal Latitude: -9.89: E. Indonesia		Geometric Cal	H. Kieffer	10.3 S, 151.1 E (Path 93, Row 67 1/4)	H. Kieffer	Yes
- Central angle: 200 Nominal Latitude: -19.78: NW Australia		Geometric Cal	H. Kieffer	20.2 S, 148.8 E (Path 93, Row 74)	H. Kieffer	Yes
- Central angle: 210 Nominal Latitude: -29.65: S. Brazil		Geometric Cal	H. Kieffer	30.9 S, 51.5 W (Path 221, Row 81 1/2)	H. Kieffer	Yes
- Central angle: 220 Nominal Latitude: -39.50 (ALTERNATIVE): S. Chilean coast		Geometric Cal	H. Kieffer	42.5 S, 73.5 W (Path 233, Row 89 1/2)	H. Kieffer	Yes
- Central angle: 220 Nominal Latitude: -39.50 (ALTERNATIVE): N. end of South Island of New Zealand		Geometric Cal	H. Kieffer	41.1 S, 174.2 E (Path 173, Row 86 1/2)	H. Kieffer	Yes
- Central angle: 230 Nominal Latitude: -49.29: S. Chilean coast		Geometric Cal	H. Kieffer	50.3 S, 74.85 W (Path 232, Row 95)	H. Kieffer	Yes
- Central angle: 240 Nominal Latitude: -58.98: South Orkney Islands		Geometric Cal	H. Kieffer	60.7 S, 44.8 W (Path 209, Row 102 1/2)	H. Kieffer	Yes
- Central angle: 250 Nominal Latitude: -68.41: Antarctic Peninsula		Geometric Cal	H. Kieffer	67.5 S, 67.9 W (Path 220, Row 107 1/2)	H. Kieffer	Yes

ASTER Cal/Val Test Sites

Site Name	Algorithm	Site Description	ASTER test site	Objectives	Site Accessibility	Minimum Site size	Extended Site size
- Central angle: 150 Nominal Latitude: 29.65 (ALTERNATIVE): W. coast of Florida	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 150 Nominal Latitude: 29.65 (ALTERNATIVE): Midway Island	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 160 Nominal Latitude: 19.78 (ALTERNATIVE): Hawaii	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 160 Nominal Latitude: 19.78 (ALTERNATIVE): Phillipine Island	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 170 Nominal Latitude: 9.89: E. coast of Malaysia	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 180 Nominal Latitude: 0.00: S. of Singapore	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 190 Nominal Latitude: -9.89: E. Indonesia	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 200 Nominal Latitude: -19.78: NW Australia	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 210 Nominal Latitude: -29.65: S. Brazil	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 220 Nominal Latitude: -39.50 (ALTERNATIVE): S. Chilean coast	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 220 Nominal Latitude: -39.50 (ALTERNATIVE): N. end of South Island of New Zealand	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 230 Nominal Latitude: -49.29: S. Chilean coast	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 240 Nominal Latitude: -58.98: South Orkney Islands	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 250 Nominal Latitude: -68.41: Antarctic Peninsula	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)

ASTER Cal/Val Test Sites

Site Name	Site Occupation	Elevation	Surface Cover Type	Climate	Nearest Weather Station	Available data
- Central angle: 150 Nominal Latitude: 29.65 (ALTERNATIVE): W. coast of Florida	native population; no instrumentation.	0	open water, land			Maps
- Central angle: 150 Nominal Latitude: 29.65 (ALTERNATIVE): Midway Island	native population; no instrumentation.	0	open water, land			Maps
- Central angle: 160 Nominal Latitude: 19.78 (ALTERNATIVE): Hawaii	native population; no instrumentation.	0	open water, land			Maps
- Central angle: 160 Nominal Latitude: 19.78 (ALTERNATIVE): Phillipine Island	native population; no instrumentation.	0	open water, land			Maps
- Central angle: 170 Nominal Latitude: 9.89: E. coast of Malaysia	native population; no instrumentation.	0	open water, land			Maps
- Central angle: 180 Nominal Latitude: 0.00: S. of Singapore	native population; no instrumentation.	0	open water, land			Maps
- Central angle: 190 Nominal Latitude: -9.89: E. Indonesia	native population; no instrumentation.	0	open water, land			Maps
- Central angle: 200 Nominal Latitude: -19.78: NW Australia	native population; no instrumentation.	0	open water, land			Maps
- Central angle: 210 Nominal Latitude: -29.65: S. Brazil	native population; no instrumentation.	0	open water, land			Maps
- Central angle: 220 Nominal Latitude: -39.50 (ALTERNATIVE): S. Chilean coast	native population; no instrumentation.	0	open water, land			Maps
- Central angle: 220 Nominal Latitude: -39.50 (ALTERNATIVE): N. end of South Island of New Zealand	native population; no instrumentation.	0	open water, land			Maps
- Central angle: 230 Nominal Latitude: -49.29: S. Chilean coast	native population; no instrumentation.	0	open water, land			Maps
- Central angle: 240 Nominal Latitude: -58.98: South Orkney Islands	native population; no instrumentation.	0	open water, land (exposed in Austral Autumn only)			Maps
- Central angle: 250 Nominal Latitude: -68.41: Antarctic Peninsula	native population; no instrumentation.	0	open water, land (exposed in Austral Autumn only)			Maps

Site Name	Field equipment Measurement accuracy	Observation Requirement	Data processing requirements	Key words	Attachments	Cog I Planned Measurements
- Central angle: 150 Nominal Latitude: 29.65 (ALTERNATIVE): W. coast of Florida	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 150 Nominal Latitude: 29.65 (ALTERNATIVE): Midway Island	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 160 Nominal Latitude: 19.78 (ALTERNATIVE): Hawaii	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 160 Nominal Latitude: 19.78 (ALTERNATIVE): Phillipine Island	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 170 Nominal Latitude: 9.89: E. coast of Malaysia	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 180 Nominal Latitude: 0.00: S. of Singapore	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 190 Nominal Latitude: -9.89: E. Indonesia	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 200 Nominal Latitude: -19.78: NW Australia	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 210 Nominal Latitude: -29.65: S. Brazil	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 220 Nominal Latitude: -39.50 (ALTERNATIVE): S. Chilean coast	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 220 Nominal Latitude: -39.50 (ALTERNATIVE): N. end of South Island of New Zealand	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 230 Nominal Latitude: -49.29: S. Chilean coast	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 240 Nominal Latitude: -58.98: South Orkney Islands	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 250 Nominal Latitude: -68.41: Antarctic Peninsula	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps

ASTER Cal/Val Test Sites

Site Name	Type	Working Group	Site Cog I	lat/lon	Participating institutions and team members	Algorithm val site?
- Central angle: 260 Nominal Latitude: -77.03: Peak 8986 in Transantarctic Range		Geometric Cal	H. Kieffer	77.4 S, 160.5 E (Path 59, Row 115 1/3)	H. Kieffer	Yes
- Central angle: 270 Nominal Latitude: -81.70: Peak 3248 in Transantarctic Range		Geometric Cal	H. Kieffer	80.5 S, 160.5 E (Path 50, Row 118 1/2)	H. Kieffer	Yes
Ariake Bay/Saga		Radiometric Cal				
Lake Tahoe	Vicarious Calibration/ Standard Product Validation	Radiometric Cal, Atmospheric	K. Thome	39.2 North, 119.8 West	ASTER: University of Arizona - P. Slater, K. Thome: Jet Propulsion Laboratory - A. Kahle, F. Palluconi, S. Hook, J. Schieldge. MODIS: University of Arizona - P. Slater, K. Thome	No
Lunar Lake	Vicarious Cal.	Radiometric Cal	K. Thome	38.4 North latitude; 116.0 West Longitude	University of Arizona - P. Slater, K. Thome	No
Moon	Vicarious Calibration/ Standard Product Validation	Radiometric Cal		n/a	H. Kieffer, NAU/USGS Lunar Photometry program	no
Mutsu Bay-Sanriku Peninsula	Vicarious Cal.	Radiometric Cal				
Namibia Coast		Radiometric Cal	H. Kieffer	25 S / 15 E	H. Kieffer	Yes
Nemuro/Kushiro		Radiometric Cal				

ASTER Cal/Val Test Sites

Site Name	Algorithm	Site Description	ASTER test site	Objectives	Site Accessibility	Minimum Site size	Extended Site size
- Central angle: 260 Nominal Latitude: -77.03: Peak 8986 in Transantarctic Range	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
- Central angle: 270 Nominal Latitude: -81.70: Peak 3248 in Transantarctic Range	Level-1 Geometry	abrupt land/water boudaries at many azimuths	ASTER, Yes. Other?: ?? MODIS could use.	Verify geometric calibration files; Verify geometric stability.	Boat; none needed	30 km square	TBD; nominal 100 x 100 km)
Ariake Bay/Saga							
Lake Tahoe	Level 1 processing Calibration coefficients, Level 2 surface radiance, surface reflectance	High altitude, large surface area, deep water lake on the California-Nevada border	ASTER calibration test site which will also be used for MODIS calibration	To provide a thermally uniform target for inflight radiometric calibration and cross-calibration of ASTER and MODIS. *	Easy. Site is accessible via well maintained roads. Snow can cause access problems at some points. Since the site is a water target, aircraft and boats are necessary for access. Shore locations are available.	3 km by 3 km	15 km by 30 km
Lunar Lake	Level 1 radiometric calibration	Clay, dry-lake, playa surface	ASTER calibration site	Objective is to provide a bright, uniform target for radiometric calibration in the VNIR and SWIR	Easy to moderate. Paved roads lead to the area with access to target site via unpaved playa surface which can be soft when wet. For some areas of the playa, 4-wheel drive is recommended	1 km by 1 km	3 km by 3 km
Moon		Airless large natural satellite. Sharp edges against zero background radiance.	Yes. Other?: MODIS, MISR	Radiometric stability; characterize geometric response functions.	None	2 degree strip	2 degree strip
Mutsu Bay-Sanriku Peninsula							
Namibia Coast	Level 1	Ocean/desert coastline	ASTER, yes. Other, no	characterize radiometric response function, scattered light	Difficult	60 km swath centered on coast	coast extends many 100 km
Nemuro/Kushiro							

ASTER Cal/Val Test Sites

Site Name	Site Occupation	Elevation	Surface Cover Type	Climate	Nearest Weather Station	Available data
- Central angle: 260 Nominal Latitude: -77.03: Peak 8986 in Transantarctic Range	native population; no instrumentation.	2300 m	open water, land (exposed in Austral Autumn only)			Maps
- Central angle: 270 Nominal Latitude: -81.70: Peak 3248 in Transantarctic Range	native population; no instrumentation.	1000 m	open water, land (exposed in Austral Autumn only)			Maps
Ariake Bay/Saga						
Lake Tahoe	For ASTER purposes, the site is only occupied for calibration/validation exercises. It should be possible to make arrangements for setting up equipment for more frequent measurements.	1900 m	100% water	Mountainous region in Western US so winters are cold with frequent snow storms moving through the region. Summers are cool and typically dry with periods of higher moisture.*	Nearest weather station: Truckee/Tahoe airport records winds, temperature and pressure - 10 km. Nearest radiosonde station: Reno, NV - 50 km	Landsat 5 - EDC; AVHRR - EDC
Lunar Lake	Site is only occupied during calibration experiments	1800 m	Clay soils, no vegetation on target site, very little vegetation over extended site	Winter temperatures should often reach below -5 degrees C while summer temperatures should regularly exceed 30 degrees C. The wet seasons are the summer. Large areas of the playa should be underwater in spring. Snow is common in the winter.	Weather station: Ely - 250 km; Radiosonde station: Mercury, Nevada - 180 km	Landsat 5 - EDC; SPOT 3 - SPOT Corp.; AVIRIS - JPL
Moon	none	n/a; see CAM descriptions	lunar soil and highlands	none	384,000 km	Lunar photometric model being developed
Mutsu Bay-Sanriku Peninsula						
Namibia Coast	nil; no instrumentation	0	ocean, sand; nil vegitation	dry marine (fog at night)	Windhoek?	Maps
Nemuro/Kushiro						

ASTER Cal/Val Test Sites

Site Name	Field equipment Measurement accuracy	Observation Requirement	Data processing requirements	Key words	Attachments	Cog I Planned Measurements
- Central angle: 260 Nominal Latitude: -77.03: Peak 8986 in Transantarctic Range	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
- Central angle: 270 Nominal Latitude: -81.70: Peak 3248 in Transantarctic Range	None needed	preflight: none In-flight: Early VNIR & SWIR & TIR.	Normal Level 1A & Level 1B	Geometry, registration		Existing Large scale Maps
Ariake Bay/Saga						
Lake Tahoe	No equipment exists at site. *	Data acquisitions requirements are identical pre-flight and in-flight. The data should be collected under clear-sky conditions.	For the calibration work, Level 1 ASTER data are required. For the atmospheric correction validation, the Level 2 surface radiance and surface reflectance products are required.	Lake Tahoe, calibration, ASTER, MODIS, atmospheric correction		U of A RSG will make airborne-based measurements of upwelling radiance from the Lake, atmospheric transmittance using ground-based solar radiometers at the lakeshore and at Truckee/Tahoe airport and sky radiance measurements from Truckee/Tahoe airport.
Lunar Lake	*	Data acquisitions requirements are identical pre-flight and in-flight. The data should be collected under clear-sky conditions	Level 1 ASTER data are required	Lunar Lake, calibration, ASTER		UofA RSG will make ground- and airborne-based measurements of surface reflectance and surface radiance. Airborne measurements will be from >10,000' ASL. Will measure atmospheric transmittance using ground-based solar radiometers as well as sky radiance
Moon	Lunar observatory; 2% radiometry	Continuing Lunar photometric program In-flight: VNIR & SWIR during CAM at 6 month intervals.	Normal Level 1A & Level 1B.	Geometry, Radiometry, calibration, spatial response, registration.		Long-term ground-based telescopic photometry program leading to lunar photometric model
Mutsu Bay-Sanriku Peninsula						
Namibia Coast	None	preflight: none In-flight: Early VNIR & SWIR & TIR	Normal Level 1A & Level 1B.	Radiometry extended spatial response		Existing Large scale Maps: Yes
Nemuro/Kushiro						

ASTER Cal/Val Test Sites

Site Name	Type	Working Group	Site Cog I	lat/lon	Participating institutions and team members	Algorithm val site?
Railroad Valley	Vicarious Calibration/ Standard Product Validation	Radiometric Cal, Atmospheric	K. Thome	38.5 North latitude, 115.7 West longitude	ASTER: University of Arizona - P. Slater, K. Thome: JPL - F. Palluconi: MODIS: University of Arizona - P. Slater, K. Thome	No
Ivanpah Playa	Vicarious Cal.	Radiometric Cal	K. Thome	35.5 North, 115.4 W	University of Arizona - P. Slater, K. Thome	No
Tsukuba/Kasumigaura Lake		Radiometric Cal				
White Sands Missile Range (Chuck Site)	Vicarious Cal.	Radiometric Cal, Atmospheric	K. Thome	32.9 North, 106.3 W	University of Arizona - P. Slater, K. Thome	No
Grand Cyn		DEM	H. Kieffer	36.1 N / 111.9 W	H. Kieffer, USGS Nat. Map.	Yes
Huntsville*	Std. Prod. Val.	DEM	R. Welch			
Lake Okoboji	Std. Prod. Val.	DEM	B. Bailey	43°00'N, 95°30'W	USGS: Bailey, Kieffer, Wivell, Kelly	COTS
Marseilles	Std. Prod. Val.	DEM				
Mt. Aso	Std. Prod. Val.	DEM				

ASTER Cal/Val Test Sites

Site Name	Algorithm	Site Description	ASTER test site	Objectives	Site Accessibility	Minimum Site size	Extended Site size
Railroad Valley	Level 1 radiometric calibration	Clay, dry-lake, playa surface	ASTER calibration site, MODIS calibration site	Objective is to provide a bright, uniform target for radiometric calibration in the VNIR and SWIR	Easy to moderate. Paved roads lead to the area with access to target site via unpaved roads which can be soft when wet. For some areas of the playa, 4-wheel drive is recommended	1 km by 1 km	10 km by 15 km
Ivanpah Playa	Level 1 radiometric calibration	Clay, dry-lake, playa surface	ASTER calibration site, AVIRIS calibration site	Objective is to provide a bright, uniform target for radiometric calibration in the VNIR and SWIR	Site access is granted through the BLM. Site is reached via paved roads and the hard lake bed. There is a region where the surface is soft and bumpy which can be problematic under wetter conditions and for some vehicles all of the time	1 km by 1 km	2 km by 8 km
Tsukuba/Kasumigaura Lake							
White Sands Missile Range (Chuck Site)	Level 1 radiometric calibration	Flat gypsum surface of high reflectance	ASTER calibration target	Objective is to provide a bright, uniform target for radiometric calibration in the VNIR and SWIR	Site accessibility is limited by the military. If permission is granted, reaching the site is easy by well-maintained roads.	1 km by 1 km	50 km by 50 km
Grand Cyn	DEM	Large natural canyon	ASTER, yes. Other, no	Verify DEM in rugged terrain	Limited to rim	10 x 20 km	10 x 20 km
Huntsville* **Lake Okoboji**	COTS	Agriculture/Rural - characterized by regular grid of farm-to-market roads on 1-mile squares. Gentle rolling topography	ASTER - DEM, Geom.	Validate DEM capability/measure geometric fidelity of system	Easy	60x60 km	60x120 km
Marseilles							
Mt. Aso							

ASTER Cal/Val Test Sites

Site Name	Site Occupation	Elevation	Surface Cover Type	Climate	Nearest Weather Station	Available data
Railroad Valley	unoccupied	1400 m	Clay soils, no vegetation on target site, very little vegetation over extended site	No direct knowledge of the area's climate but Winter temperatures should reach below -5 degrees C while summer temperatures should exceed 30 degrees C. The wet seasons are the summer and winter*	Weather station: Ely - 100 km; Radiosonde station: Mercury, Nevada - 200 km	Landsat 5 - EDC; SPOT 3 - SPOT Corp.
Ivanpah Playa	Site is only occupied for calibration experiments. Typically 1-3 days per year.	250 m	Clay playa surface with no vegetation on the test site	Summers are hot with temperatures in excess of 40 degrees C. Rainfall is sparse with rain occuring mostly in the summer and winter months. Summer rainfall is from thunderstorms. Winter rain is from extended weather systems marked by frequent clouds	Las Vegas - 25 km	AVIRIS - JPL, Landsat 5 - EDC
Tsukuba/Kasumigaura Lake						
White Sands Missile Range (Chuck Site)	Site is occupied only at times of calibration experiments. Currently, this is 3-4 weeks per year	1200 m	Calibration site is gypsum with no vegetation. The gypsum is not loose as in the surrounding dune areas. Surrounding areas have 0 - 20% vegetation	Winter temperatures often reach below -5 degrees C, summer temperatures regularly exceed 30 degrees C. The wet seasons are the summer and winter with rain in the summer. Spring and fall are often cloudy.	Nearest weather station: Holloman Air Force Base - 15 km. Nearest radiosonde: El Paso - 150 km	Landsat 5 - EDC: SPOT 1, 2, and 3 - SPOT corporation: AVHRR - EDC: JERS 1 - ?: ERS 1 - ?: AVIRIS - JPL
Grand Cyn	no instrumentation	700 - 2300 m	sparse desert (pine forest on rims)	semi-arid, occasional snow in winter Imaging shuld be done in summer to avoid shadows	Bellemont, 100 km South	DEM on 30 m grid
Huntsville* Lake Okoboji	at will	1400' +/-	Corn and beans mostly. Growing season:100%, Winter, 20%.	Northern midwest - temperate climate	Sioux City - 70 mi.	GCPs anticipated - maps, orthophotomap
Marseilles						
Mt. Aso						

ASTER Cal/Val Test Sites

Site Name	Field equipment Measurement accuracy	Observation Requirement	Data processing requirements	Key words	Attachments	Cog I Planned Measurements
Railroad Valley	*	Data acquisitions requirements are identical pre-flight and in-flight. The data should be collected under clear-sky conditions	Level 1 ASTER data are required	Railroad Valley, calibration, ASTER, cross-calibration		The UofA RSG will make ground- and airborne-based measurements of surface reflectance and radiance. Airborne measurements will be from >10,000' ASL. Will measure atmospheric transmittance using ground-based solar radiometers as well as sky radiance
Ivanpah Playa	•	Data acquisitions requirements are identical pre-flight and in-flight. The data should be collected under clear-sky conditions	Level 1 ASTER data are required	Ivanpah, calibration, ASTER		UofA RSG will make ground- and airborne-based measurements of surface reflectance and radiance. Airborne measurements will be from >10,000' ASL. Will measure atmospheric transmittance using ground-based solar radiometers as well as sky radiance measureme
Tsukuba/Kasumigaura Lake						
White Sands Missile Range (Chuck Site)	*	Data acquisitions requirements are identical pre-flight and in-flight. The data should be collected under clear-sky conditions.	Level 1 ASTER data are required	White Sands, calibration, ASTER		Ground-based measurements of surface reflectance and surface radiance, airborne-based measurements of upwelling radiance from the Lake at >10,000 feet, atmospheric transmittance using solar radiometers as well as sky radiance measurements.*
Grand Cyn	completed	completed. In-flight: Band 3 stereo.	DEM product.	Geometry, DEM		Existing DEM & Large scale Maps
Huntsville* **Lake Okoboji**	GPS available	Ground control pre-flight, 1 good 14-band stereo scene - stereo + 14 bands can be on different acquisitions		DEM, geometry, Iowa, Okoboji		measure required GPCs, produce DEM
Marseilles						
Mt. Aso						

ASTER Cal/Val Test Sites

Site Name	Type	Working Group	Site Cog I	lat/lon	Participating institutions and team members	Algorithm val site?
Mount Etna, Sicily, Italy*	Std. Prod. Val.	DEM	D. Pieri	37.734N, 15.004E	D. Pieri, M. Abrams, R. Bianchi, F. Buongiorno, T. Caltabiano. Institutions: Jet Propulsion Laboratory, Italian National Insitute of Geophysics (ING), Italian National Research Council (CNR)*	No
Mt. Fuji	Std. Prod. Val.	DEM				
Mt. Hijiri	Std. Prod. Val.	DEM				
MT. Hotaka	Std. Prod. Val.	DEM				
Mt. Unzen	Std. Prod. Val.	DEM				
Mutsu Bay/Sanriku Peninsula	Std. Prod. Val.	DEM				
Oshima	Std. Prod. Val.	DEM				
Taxco-Iguala*	Std. Prod. Val.	DEM	H. Lang	18°27'N 99°35'W	JPL/Lang (Lead), Univ. of Ga/Roy Welch (Co-Lead)	Yes
Drum Mtns*	Std. Prod. Val.	DEM	B. Bailey	39°30'N, 113° 00'W	USGS-EDC: Bailey, Wivell, Kelly	Yes - ASTER DEM ATBD
Lunar Lake	Vicarious Cal	Atmospheric	K. Thome	38.4 North latitude, 116.0 West Longitude	University of Arizona - K. Thome	No

ASTER Cal/Val Test Sites

Site Name	Algorithm	Site Description	ASTER test site	Objectives	Site Accessibility	Minimum Site size	Extended Site size
Mount Etna, Sicily, Italy*	Digital Elevation Model (DEM)- AST14 (Parameter Number 2828)	A basaltic shield volcano approx. 30kmx45km, rising from sea level to approx. 3350 meters. It contains a variety of terrains (average slope < 5degrees). New lava flows tend to erupt every year.*	ASTER Team member cal/val site *	to (a) assess ASTER-derived DEM errors, (b) assess feature registration and topographic errors in co-registered ASTER data sets (c) assess detection thresholds and errors for topographic change analyses*	easy to moderate, depending on the sector of interest *	20x20 km	40x50km
Mt. Fuji							
Mt. Hijiri							
MT. Hotaka **Mt. Unzen**							
Mutsu Bay/Sanriku Peninsula							
Oshima							
Taxco-Iguala*	DEM	Region of moderate high-relief with variable vegetation cover in the southern Mexican fold and thrust belt	Yes	Validate ASTER DEM data product and ASTER VNIR stereo pairs	Easy by road. 2.5 hr drive south of Mexico City by major highway	60 x 60 km	N/A
Drum Mtns*	COTS	Semiarid western United States. Rocks exposed in the study area include a thick sequence of westerly dipping Cambrian limestones........*	ASTER	Test DEM product generation for mod.-high relief areas. Also, will test rock discrimination/id capabilities of ASTER data here	Good — mostly paved road to Delta (25 miles); airport at Delta	20x20 km	60x60 km
Lunar Lake	Level 2 surface radiance and surface reflectance	Clay, dry-lake, playa surface	ASTER validation site	Objective is to provide a bright, uniform target for validating the retrieval of surface reflectance	Easy to moderate. Paved roads lead to the area with access to target site via unpaved playa surface which can be soft when wet. For some areas of the playa, 4-wheel drive is recommended	1 km by 1 km	3 km by 3 km

ASTER Cal/Val Test Sites

Site Name	Site Occupation	Elevation	Surface Cover Type	Climate	Nearest Weather Station	Available data
Mount Etna, Sicily, Italy*	Mt. Etna is occupied year round.	Maximum summit elevation is approximately 3350m, which can change depending on how eruptive activity affects the summit area. The lowest slopes of the volcano reach the east coast of Sicily from Catania north to Taormina and Acireale.	Coverage is variable. Above approximately 1000m ASL slopes become progressively and rapidly less vegetated. The summit area above 2000m is lunar-like.	Winter snow cover above 1000m can be total. Summer conditions can be variable. Often summer mornings are clear, with afternoon cloud buildups. Fall weather is often foggy throughout the day. Best imaging periods are June through September.*	Catania Airfield, approximately 30km from the summit.	DEMs (1:50,000/1:10,000), TIMS, AVIRIS, NS001, MIVIS, Zeiss airphotos, GPS, COSPEC, Landsat TM, Landsat MSS, JERS-1, SPOT, SAR, interferometric SAR.
Mt. Fuji						
Mt. Hijiri						
MT. Hotaka						
Mt. Unzen						
Mutsu Bay/Sanriku Peninsula						
Oshima						
Taxco-Iguala*	Unoccupied	500-2200 m	Variable soil, bedrock, alluvium and vegetation cover (0-100%)	Subtropical/hot	unknown and not relevent	Considerable*
Drum Mtns*	in general, not occupied	5000 to 7000'	low veg/sage, juniper, grass/about 30%	Basin and Range temperature - winter snow, hot summer/cold winter	Delta (?), 25 mi.	Geologic and topographic maps, digital topographic data, aerial photographs, Seasat SAR, Landsat MSS and TM, SPOT XS and Pan, SPOT Stereo, AVIRIS, TIMS, GER, GEOSCAN, polarimetrically calibrated AIRSAR, IRIS, PIDAS, rock samples, lab spectra, and more*
Lunar Lake	Site is only occupied during validation experiments	1800 m	Clay soils, no vegetation on target site, very little vegetation over extended site	Winter temperatures often reach below -5 degrees C, summer temperatures regularly exceed 30 degrees C. The wet seasons are the summer and winter with rain in the summer. Spring and fall are often cloudy.	Weather station: Ely - 250 km. Radiosonde station: Mercury, Nevada - 180 km	Landsat 5 - EDC; SPOT 3 - SPOT Corp.; AVIRIS - JPL

ASTER Cal/Val Test Sites

Site Name	Field equipment Measurement accuracy	Observation Requirement	Data processing requirements	Key words	Attachments	Cog I Planned Measurements
Mount Etna, Sicily, Italy*	Permanent GPS sites. Portable GPS equipment available through CNR in Italy. MIVIS/CASA-212 overflights available in collaboration with CNR-Pomezia. Airsonde equipment available. COSPEC equipment available courtesy of IIV/CNR-Catania. *	Pre-flight: Acquisition and organization of currently available DEMs from Italian and U.S. sources. SPOT Image stereo pair of Etna for simulation of ASTER data. Interferometric SAR desired.	(a) Stereo mosaic of Mt. Etna processed to produce ASTER-derived DEM of test site at least once per year.	DEM, inflation, Etna, shield volcano, GPS, topographic mapping.		•verify GPS measurements of Ground Control Points (GCPs) from permanent and portable GPS stations •Determine characteristics of natural terrain GCP sites • field cal measurements or other equipment deployments necessary in conjunction with overpasses *
Mt. Fuji						
Mt. Hijiri						
MT. Hotaka						
Mt. Unzen						
Mutsu Bay/Sanriku Peninsula						
Oshima						
Taxco-Iguala*	GPS instruments capable of equal to or less than 5 m rmse are in-hand and available for use in validation work	In-flight VNIR stereo acquisition 2 times/year (Dec-Feb and Oct-Nov) throughout mission	Process items 19) to level 1b and to DEM Standard Data Product	Taxco-Iguala, DEM, Validation site		Already in hand are items listed in Observation requirements column. GPS measurements will also be made per Field Equipment column during mission
Drum Mtns*	High accuracy GPS	Pre-flight GPS	Standard product - DEM	Dum Mountains, DEM, Utah, semi-arid		Will do pre-launch GPS; have spectral data already
Lunar Lake	*	Data acquisitions requirements are identical pre-flight and in-flight. The data should be collected under clear-sky conditions	Level 2 surface radiance and surface reflectance ASTER data are required	Lunar Lake, validation, atmospheric correction, ASTER		UofA RSG will make ground- and airborne-based measurements of surface reflectance and surface radiance. Airborne measurements will be from >10,000' ASL. Will measure atmospheric transmittance using ground-based solar radiometers as well as sky radiance

ASTER Cal/Val Test Sites

Site Name	Type	Working Group	Site Cog I	lat/lon	Participating institutions and team members	Algorithm val site?
Maricopa	Std. Prod. Val.	Atmospheric	K. Thome	33.1 North latitude, 113.0 West Longitude	University of Arizona - K. Thome	No
Salton Sea*	Std. Prod. Val.	Atmospheric	F. Palluconi	115.72W, 33.32N	University of Arizona, Kurt Thome	Yes, Land leaving radiance
Tateno/Tsukuba	Std. Prod. Val.	Atmospheric	T. Takashima	36.03N, 140.08E	Meteorological Research Institute (T.Takashima, K.Masuda, Y.Takayama); Geological Survey of Japan (Y.Yamaguchi, T.Matsunaga, S.Tsuchida); National Institute for Environmental Studies; Nagasaki University(M.Moriyama)	Yes
Oklahoma (DOE ARM Site)	Vicarious Calibration/ Standard Product Validation	Atmospheric	R. Welch			
Nome (DOE ARM Site)	Vicarious Calibration/ Standard Product Validation	Atmospheric	R. Welch			
Kwajalein Island (DOE ARM Site)	Vicarious Calibration/ Standard Product Validation	Atmospheric	R. Welch			
Amazon	Std. Prod. Val.	T-E Separation				
Bluff Creek/Wind River	Std. Prod. Val.	T-E Separation	A. Gillespie			
Caribbean	Std Prod Val	T-E Separation				
Castaic Lake*	Std. Prod. Val.	T-E Separation	A. Gillespie			
Izuoshima	Std. Prod. Val.	T-E Separation	Rokugawa			
Kelso Dunes*	Std. Prod. Val.	T-E Separation	A. Gillespie			
Kirishima		T-E Separation	Rokugawa			
Lake Tahoe*	Std Prod. Val	T-E Separation				
Mokelumne*	Std. Prod. Val.	T-E Separation	A. Gillespie			

ASTER Cal/Val Test Sites

Site Name	Algorithm	Site Description	ASTER test site	Objectives	Site Accessibility	Minimum Site size	Extended Site size
Maricopa	Level 2 surface radiance and surface reflectance	Highly controlled agricultural area with a variety of crop types	ASTER validation site	The objective of this site is validate the retrieval of low surface reflectance and surface radiances in a relatively clear, dry atmosphere.	Easy access once permission has been obtained to use the area. Paved and well-maintained dirt roads lead to site	1 km by 1 km	5 km by 5 km
Salton Sea*	TIR Atmospheric correction	The Salton Sea is a large (approx. 15X60 km) salt water inland lake in the US	Yes. Could be used by MODIS or Landsat	This is a low elevation site providing at times a warm humid atmospheric column	Easy to reach by road and boat	4 x 4 km	60 x 60 km
Tateno/Tsukuba	atmospheric correction	Located at 60 km north of Tokyo on the Pacific Ocean side of the Japan main Island(Honshu Island). Lake Kasumigaura is 7m depth at the deepest location, which is the secondary biggest lake in Japan	Proposed	Many institutions and scientists are available at the site. Furthermore the Aerological Observatory provide radiosonde data and meteorological	Researchers outside the site can easily be reached by public railway, bus and private cars. Many reasonable hotels are available.	dimension of site is 40kmx40km. vegetation field, lake, urban area are within the site	the site is extended to the Pacific Ocean. To the north, mountain area is located.
Oklahoma (DOE ARM Site)							
Nome (DOE ARM Site)							
Kwajalein Island (DOE ARM Site)							
Amazon							
Bluff Creek/Wind River							
Caribbean							
Castaic Lake*							
Izuoshima							
Kelso Dunes*							
Kirishima							
Lake Tahoe*							
Mokelumne*							

ASTER Cal/Val Test Sites

Site Name	Site Occupation	Elevation	Surface Cover Type	Climate	Nearest Weather Station	Available data
Maricopa	Site is occupied with below equipment only for validation experiments. Site is occupied with farm personnel on a daily basis.	350 m	Bare soil, tilled bare soil, laser-levelled tilled bare soil, agricultural crops of various types in various stages of growth.	Mild winters with frequent extended regions of clouds. Brutally hot summers with tempuratures sometimes near 45 degrees C. Convective cloud buildups are also common during the summer, as are extended periods of clear skies	Weather station: Phoenix - 75 km: Radiosonde station: Tucson - 150 km	Landsat 5 - EDC; SPOT 1 and 2 - SPOT Corp.; AVIRIS - JPL
Salton Sea*	Unoccupied	1235 feet	Water	Warm and humid in late summer, never freezes	Not known	None known
Tateno/Tsukuba	all the year around, the site is open	a little above the sea level	vegetation, urban, rice field and lake	little snow in winter. clear in winter especially in January. Humid in summer. rainy season in June and early July.	inside the site	meteorological data & aerological data
Oklahoma (DOE ARM Site)						
Nome (DOE ARM Site)						
Kwajalein Island (DOE ARM Site)						
Amazon						
Bluff Creek/Wind River						
Caribbean						
Castaic Lake*						
Izuoshima						
Kelso Dunes*						
Kirishima						
Lake Tahoe*						
Mokelumne*						

ASTER Cal/Val Test Sites

Site Name	Field equipment Measurement accuracy	Observation Requirement	Data processing requirements	Key words	Attachments	Cog I Planned Measurements
Maricopa	*	Data acquisitions requirements are identical pre-flight and in-flight. The data should be collected under clear-sky conditions	Level 2 surface radiance and surface reflectance ASTER data are required	Maricopa, validation, atmospheric correction, ASTER		The UofA RSG will make ground- and airborne-based measurements of surface reflectance and radiance. Airborne measurements will be from >10,000' ASL. Will measure atmospheric transmittance using ground-based solar radiometers as well as sky radiance
Salton Sea*	Equipment brought to site: radiometers, radiosondes, buoys, sun photometers, GPS receivers	To be used both pre-flight and in-flight	Standard atmospheric correction plus estimating area average water temperature	Atmospheric correction, water, thermal infrared, ASTER, TIMS		Bulk water temperature, surface skin temperature, atmospheric temperature and water vapor profiles, position measurements
Tateno/Tsukuba	portable radiometer, sunphotometer, aureolemeter, spectrometer, polarimeter etc.		Not specific	Not specific		At the moment, we compare radiometers. We plan to continue this comparison
Oklahoma (DOE ARM Site)						
Nome (DOE ARM Site)						
Kwajalein Island (DOE ARM Site)						
Amazon						
Bluff Creek/Wind River						
Caribbean						
Castaic Lake*						
Izuoshima						
Kelso Dunes*						
Kirishima						
Lake Tahoe*						
Mokelumne*						

ASTER Cal/Val Test Sites

Site Name	Type	Working Group	Site Cog I	lat/lon	Participating institutions and team members	Algorithm val site?
Tottori Sakyu	Std. Prod. Val.	T-E Separation	T. Matsunaga	35.53N, 134.22E	Tsuneo Matsunaga(Geological Survey of Japan)	Yes. This site will be listed in Temperature-Emissivity Separation ATBD ver2.1 or later.
Tsukuba/Kasumigaura Lake		T-E Separation	Rokugawa			
Mammoth Lakes*	Std. Prod. Val.	T-E Separation				
Castaic Lake*	Spec. Prod. Val.	OLLSI				
Lake Inbanuma, Japan	Spec. Prod. Val.	OLLSI	Ishiyama, T.	35 45'N/140 15'E	T. Ishiyama(CEReS, Chiba Univ): SANYO Techno Marine Co,ltd	Chiba University
Lake Nakaumi	Spec. Prod. Val.	OLLSI	Tsuneo Matsunaga, Geological Survey of Japan(GSJ)	GSJ/ T. Matsunaga, Simane University, RIKEN/ M. Kishino		
Lake Shinji	Spec. Prod. Val.	OLLSI	Tsuneo Matsunaga, Geological Survey of Japan(GSJ)	GSJ/ T. Matsunaga, Simane University, RIKEN/ M. Kishino		

ASTER Cal/Val Test Sites

Site Name	Algorithm	Site Description	ASTER test site	Objectives	Site Accessibility	Minimum Site size	Extended Site size
Tottori Sakyu	Temperature-Emissivity separation algorithm	Tottori Sakyu is a linksland in Tottori Prefecture, west Japan, and faces Japan Sea. Its sand particles are mainly quartz particles from weathered granite rocks. There are two small lakes, a port to Japan Sea, an airport, and a railroad station nearby	Yes	Validate Temperature-Emissivity separation algorithm, the atmospheric correction algorithm and the water surface temperature estimation algorithm *	Easy(Tottori Airport and Tottori JR(Japan Railway) Station are within 6km distance from Tottori Sakyu. Roads to the linksland are paved and there are bus service from airport/station to the linksland)	Tottori Sakyu: 3.5km by 1 km and the Lakes: 4 km by 2 km and 750m by 750m	10 km x 10 km
Tsukuba/Kasumigaura Lake **Mammoth Lakes***							
Castaic Lake*							
Lake Inbanuma, Japan	Vegetation Cover of Aquatic Plant	Chiba Prefc. in Japan, Shallow Lake, Eutrophication Water	Yes	Monitoring of aquatic plants (weeds) biomass change, ecological system change (4A17, special)	Car	6.3 sq km	10x10 km
Lake Nakaumi	a) Atmospheric correction and water surface temperature estimation algorithms based on the regression of in-situ temperature data and ASTER TIR data. b) TBD (based on the regression of in-situ turbidity data and ASTER VNIR data after atmosperic correction		Yes	To establish ASTER a) water surface temperature algorithm b) turbidity algorithm and validate both product (4A19 and 4A16,special).	Two airports close to the lakes. Seven flights per day from Tokyo, and it tales about an hour. JR lines along the lake coastline. Three to four hours from Osaka by train.	15 km by 13 km	
Lake Shinji	a) Atmospheric correction and water surface temperature estimation algorithms based on the regression of in-situ temperature data and ASTER TIR data. b) TBD (based on the regression of in-situ turbidity data and ASTER VNIR data after atmosperic correction		Yes	To establish ASTER a) water surface temperature algorithm b) trbidity algorithm and validate both product (4A19 and 4A16,special).	Two airports close to the lakes. Seven flights per day from Tokyo, and it tales about an hour. JR lines along the lake coastline. Three to four hours from Osaka by train.	5 km by 15 km	

ASTER Cal/Val Test Sites

Site Name	Site Occupation	Elevation	Surface Cover Type	Climate	Nearest Weather Station	Available data
Tottori Sakyu	Tottori Sakyu is located in a national park	Tottori Sakyu: 0 - 95 m and the Lakes: 0 -20 m	Mostly sand, with very sparse partial vegetation.	1993 average temperature and humidity Jan=5.2C/77%, Apr=11.9C/66%, Jul=23.9C/82%, Oct=15.2/75%. Often covered with clouds in the wintertime.	Radiosonde: Yonago City (75km west of Tottori Sakyu). Hourly meteorological data at ground-level: Tottori City(4km south of Tottori Sakyu)	ERSDAC owns several LANDSAT TM data of this site and probably has JERS-1 OPS images. GSJ has sand samples of this linksland and their lab emissivity spectra with varying water content.
Tsukuba/Kasumigaura Lake **Mammoth Lakes***						
Castaic Lake*						
Lake Inbanuma, Japan	Nationals		50 % vegetation cover by aquatic plant in summer season		Tateno, Choshi	Dry weight per unit area of aquatic plant(waterchestnut), '84 - '87 Total biomass and coverage of aquatic plant based on satellite data
Lake Nakaumi	Not privately owned	Almost sea level	Water	1990 Record: January: Temperature 6.3C, humidity 77%, wind 3.1 m/sec, precipitation 180 mm. July: Temperature 24.5C, humidity 79%, wind 3.3 m/sec, precipitation 165.5 mm	Radiosonde: Yonago (on the east shore of Lake Nakaumi) Hourly meteorological data at the ground-level: Matsue City (Located between Shinji and Nakaumi)	National Insititute of Environmental Studies has obtained various water quality and satellite data since 1980s.
Lake Shinji	Not privately owned	Almost sea level	Water	1990 Record: January: Temperature 6.3C, humidity 77%, wind 3.1 m/sec, precipitation 180 mm. July: Temperature 24.5C, humidity 79%, wind 3.3 m/sec, precipitation 165.5 mm	Radiosonde: Yonago (on the east shore of Lake Nakaumi) Hourly meteorological data at the ground-level: Matsue City (Located between Shinji and Nakaumi)	National Insititute of Environmental Studies has obtained various water quality and satellite data since 1980s.

ASTER Cal/Val Test Sites

Site Name	Field equipment Measurement accuracy	Observation Requirement	Data processing requirements	Key words	Attachments	Cog I Planned Measurements
Tottori Sakyu	Thermometer(accuracy +/- 1K, precision 0.1K) provided by GSJ and other institutions. Thermal infrared spectrometer by ERSDAC	Nadir looking. VST daytime. Simultaneous ground truth survey will be necessary.	Atmospheric correction with local radiosonde data will be preferable.	Emissivity, sand, wet atmosphere, surface temperature		In-situ surface temperature measurement(sand and water surface). In-situ surface emissivity measurement in the TIR region(sand surface). Lab sample emissivity/reflectance measurement in the TIR region
Tsukuba/Kasumigaura Lake						
Mammoth Lakes*						
Castaic Lake*						
Lake Inbanuma, Japan				Aquatic Plants, Aquatic Weeds, Lake, Eutrophication Water, Biomass	e.g. spectral data	
Lake Nakaumi	Themometer: precision 0.1K accuracy 0.5K(TBR). Various water quality measurements	Pre-flight: airborne campaign with multi band TIR sensors. In-flight: With simultaneous sea truth survey. Several times in first two years(TBR).	Data quality, cloud fraction, and other QA information must be reported to sea truth survey team with in 24 hours(TBR) after data acquisition.	Water surface temperature, turbidity, eutrophication.	none	
Lake Shinji	Themometer: precision 0.1K accuracy 0.5K(TBR). Various water quality measurements	Pre-flight: airborne campaign with multi band TIR sensors. In-flight: With simultaneous sea truth survey. Several times in first two years(TBR).	Data quality, cloud fraction, and other QA information must be reported to sea truth survey team with in 24 hours(TBR) after data acquisition.	Water surface temperature, turbidity, eutrophication.	none	

ASTER Cal/Val Test Sites

Site Name	Type	Working Group	Site Cog I	lat/lon	Participating institutions and team members	Algorithm val site?
Lake Tahoe*	Spec. Prod. Val.	OLLSI				
Mutsu Bay/Sanriku Peninsula	Spec. Prod. Val.	OLLSI	Motoaki Kishino/ The Institute of Physical and Chemical Research (RIKEN)		Culture Center of Fisheries, Aomori: Iwate University/ Y. Yokoyama (not team member): RIKEN/ M. Kishino: JGS/ T. Matsumura	JGS
Salton Sea*	Spec. Prod. Val.	OLLSI				
Tokyo Bay	Spec. Prod. Val.	OLLSI	Motoaki Kishino		Riken / M.Kishino: Tokyo University of Fisheries / H. Satoh (not team member)	Riken
Tsukuba/Kasumigaura Lake	Spec. Prod. Val.	OLLSI	Matsunaga		GSJ/ T. Matsunaga, RIKEN/ M. Kishino	GSJ, RIKEN
Sea Ice	Spec. Prod. Val.	OLLSI	R. Welch			
Death Valley*	Std. Prod. Val.	Geology	S. Hook			
Cuprite*	Std. Prod. Val.	Geology	L. Rowan	37 30 22.5N ; 117 11 00W	Jet Propulsion Laboratory, Geological Survey of Japan, U.S. Geological Survey, Others TBD	Yes

ASTER Cal/Val Test Sites

Site Name	Algorithm	Site Description	ASTER test site	Objectives	Site Accessibility	Minimum Site size	Extended Site size
Lake Tahoe*							
Mutsu Bay/Sanriku Peninsula	Atmospheric correction and water surface temperature estimation algorithm based on the regression of in-situ temperature data and ASTER TIR data	North side of Honsyu Island.	Yes	To establish ASTER water surface temperature algorithm and validate the product (4A19, special)	JR lines	60 x 45 km	60 x 60 km
Salton Sea*							
Tokyo Bay	TBD (based on the regression of in-situ turbidity data and ASTER VNIR data after atmosperic correction)		Yes	To be establish ASTER Turbidiry algorithm and validate the production (4A16, special).		40x60 km inside, 30x30 km outside (including bay mouth	50x90 km
Tsukuba/Kasumigaura Lake	a) Atmospheric correction and water surface temperature estimation algorithms based on the regression of in-situ temperature data and ASTER TIR data. b) TBD (based on the regression of in-situ turbidity data and ASTER VNIR data after atmosperic correction		Yes	To establish ASTER a) water surface temperature algorithm b) trbidity algorithm and validate both product (4A19 and 4A16,special).			
Sea Ice							
Death Valley*							
Cuprite*	Decorrelation stretch	Highly bleached argillized and silicified Tertiary volcanic rocks containing a wide range of minerals. U.S. Highway 95 bisects the area, which has low relief and sparse vegetation cover.	ASTER Validation Site	Cuprite has been used as a test site for most geologically oriented instuments because of the presence of hydrothermally altered rocks containing numerous alteration minerals, which results in spectral richness, excellent exposures, and easy access	Short drive or walk in from U.S. 95	10 km	50 km

ASTER Cal/Val Test Sites

Site Name	Site Occupation	Elevation	Surface Cover Type	Climate	Nearest Weather Station	Available data
Lake Tahoe*						
Mutsu Bay/Sanriku Peninsula	Not privately owned	Sea level	Sea water		Aomoi, Mutsu	Sea Surface temperature data by uoy stations from October 1984.
Salton Sea*						
Tokyo Bay	Not privately owned	Almost sea level	Water		Yokohama, Tateyama, Chiba (Tokyo)	3 marine station (Kanagawa, Chiba, and Tokyo) has measured various water quality parameters.
Tsukuba/Kasumigaura Lake						National Insititute of Environmental Studies has obtained various water quality and satellite data since 1980s.
Sea Ice						
Death Valley*						
Cuprite*	Unoccupied	3400 m	<5% vegetation cover	Hot arid summer; cold winter with moderate snow	Tonopah, Nev.-20 km	Landsat MSS and TM; AVIRIS; TIMS; Simulated ASTER; and numerous data sets acquired using developmental instruments

ASTER Cal/Val Test Sites

Site Name	Field equipment Measurement accuracy	Observation Requirement	Data processing requirements	Key words	Attachments	Cog I Planned Measurements
Lake Tahoe*						
Mutsu Bay/Sanriku Peninsula	6 buoy station, +- 0.1 K	In-flight: With simultaneous sea truth survey. Several times in first two years(TBR).	Data quality, cloud fraction, and other QA information must be reported to the sea truth survey team with in 24 hours(TBR) after data acquisition	Water surface temperature, turbidity, eutrophication, brakish	none	
Salton Sea*						
Tokyo Bay	Various water quality measurements	In-flight: With simultaneous sea truth survey. Several times in first two years(TBR).	Data quality, cloud fraction, and other QA information must be reported to the sea truth survey team with in 24 hours(TBR) after data acquisition	Turbidity	none	
Tsukuba/Kasumigaura Lake	Themometer: precision 0.1K accuracy 0.5K(TBR) Various water quality measurements	Pre-flight: airborne campaign with multi band TIR sensors. In-flight: With simultaneous sea truth survey. Several times in first two years(TBR).	Data quality, cloud fraction, and other QA information must be reported to sea truth survey team with in 24 hours(TBR) after data acquisition.	Water surface temperature, turbidity, eutrophication.	none	
Sea Ice						
Death Valley*						
Cuprite*	No equipment available at site. Required field equipment depends on the objective. For validation of the Decorrelation Stretch algorithm spectometers with calibration equipment are minimum; atmospheric instruments may be needed	During the initial ASTER data acquisitions, atmospheric and ground conditions should be recorded, and under-flight by an ASTER Simulator is desirable.	SCF at the participating institutions should be adequate to process the Level1A data	Decorrelation Stretch; Cuprite; validation		Spectral reflectance and emittance

ASTER Cal/Val Test Sites

Site Name	Type	Working Group	Site Cog I	lat/lon	Participating institutions and team members	Algorithm val site?
Mt. Fitton, Aus.	Std. Prod. Val.	Geology	T. Cudahy	Latitude: 29 degrees 59 minutes South -- Longitude: 139 degrees 28 minutes East	1. CSIRO Division of Exploration and Mining (Australia) - Tom Cudahy, Lew Whitbourn, Andy Gabell & Jon Huntington 2. Geological Survey of Japan - Yasushi Yamaguchi, Tsuneo Matsunaga & Yoshishi Ninomiya 3. NASA JPL - Anne Kahle & Simon Hook	No
Great Barrier Reef	Spec. Prod. Val.	Ecosystems				
Hokkaido	Spec. Prod. Val	Ecosystems				
Jornada Experimental Range	Spec. Prod. Val.	Ecosystems	T. Schmugge	32 40' N, 106 45' W	USDA/ARS Hydro. Lab., Beltsville, MD USDA/ARS Jornada Exptl. Range, Las Cruces NM USDA/ARS Soil tilth Lab, Ames Iowa, USDA/ARS Water Qual. Lab, Durant OK, Dept. of Geog., Univ OK- K. Humes, Dept. of Meteorol., Utah State Univ - L. Hipps	It will be a development and validation for the ET algorithm in arid conditions.
Kansas-Oklahoma Border	Spec. Prod. Val.	Ecosystems	T. Schmugge			
Mongolia	Spec. Prod. Val.	Ecosystems				
North-West Pacific	Spec. Prod. Val.	Ecosystems				
Palau	Spec. Prod. Val.	Ecosystems				
San Pedro Basin	Spec. Prod. Val.	Ecosystems	J. Schieldge	31.5 N and -110.5	NASA/JPL/ASTER - A. Kahle, J. Schieldge et al, USDA/ARS - T. Schmugge et al*	No
West Siberia	Science Test	Ecosystems				
South-East Asia	Spec. Prod. Val.	Ecosystems				
Taklimakan Desert	Spec. Prod. Val.	Ecosystems	T. Ishiyama	37N/80E	Takashi Ishiyama/Center for Environmental Remote Sensing (CERes), Chiba Univ..........Soichiro Tanaka/Dowa Engineering Co. LTD.........Xingjiang Institute of Biology, Pedology, and Desert Research, Academia Sinica	Algorithm lead developer site: Dowa Engineering Co., LTD

ASTER Cal/Val Test Sites

Site Name	Algorithm	Site Description	ASTER test site	Objectives	Site Accessibility	Minimum Site size	Extended Site size
Mt. Fitton, Aus.	Decorrelation stretch	Topography is undulating with <50 m local relief. The geology comprises Proterozoic sequences and intrusives. Exposure is excellent Weathering effects are weak. North & east of the ranges are broad alluvial fans shedding off into a large salt lake system*	ASTER, yes. Other, no.*	The primary objective for this site is validation of the decorrelation stretch algorithm. The data currently available for this site also has important benefits to the validation of the temperature-emissivity algorithm*	The test site is approximately one days easy drive from Adelaide or 2 hours drive from the nearest commercial airport (Leigh Creek). Once in the area, access is very easy by 4WD vehicle	30 x 30 kms	60 x 60 kms
Great Barrier Reef							
Hokkaido							
Jornada Experimental Range	ET Algorithm, a special product.	The test site is 37 km N of Las Cruces, NM, mostly on the Jornada del Muerto Plain between the Rio Grande valley and San Andres mtns. The White Sands Missile range is just E of the San Andres mtns. The semi-desert grassland site covers 78,300 hectares	It is an ASTER validation test site. It is also an LTER site.	It is a validation site for the estimates of ET from natural terrain to be derived from ASTER data. Specifically it will be used to test algorithms for calculating sensible and latent heat fluxes with the ASTER data in arid and semi-arid conditions.	Accessibility is easy for most of the site, with paved roads from Las Cruces and well maintained gravel roads in the range itself.	The size of the primary site is 25 km north-south and 35 km east-west.	About 50x50 km centered on the primary site.
Kansas-Oklahoma Border							
Mongolia							
North-West Pacific							
Palau							
San Pedro Basin	N/A	Very heteorogeneous,semi-arid terrain. Hills, desert, and mountains. *	ASTER, LTER, GLCTS	Validation test site for estimates of evapotranspiration over natural terrain *	Site is relatively easy to access.	60 x 100 km *	60 x 200 km *
West Siberia							
South-East Asia							
Taklimakan Desert	Vegetation indices fitted in semi-arid zones	Western part of China	ASTER site	To establish ASTER vegetation index algorithm fitted in semi-arid zones	Airplane and car	100x100 km	200x200 km

ASTER Cal/Val Test Sites

Site Name	Site Occupation	Elevation	Surface Cover Type	Climate	Nearest Weather Station	Available data
Mt. Fitton, Aus.	Site is occupied year round by various farmers working sheep farms	50-400 metres above S.L.	Vegetation is sparse ranging from areas of no vegetation cover, to areas of grasses, shrubs (saltbush and bluebush) and scattered eucalypts (total 10-15% cover) to denser stands of Eucalypt, Malaleuca and/or Acacia along drainage channels (50% cover)	Semiarid, hot and generally clear skies.	Woomera (250 km WSW) - Radiosonde launched everyday at 0830 Hrs (Ph: 086-737-271)	Extensive*
Great Barrier Reef						
Hokkaido						
Jornada Experimental Range	The site occupied year round by the ARS facility there. We currently have two flux operating on a continuous basis. There are regular vegetation surveys as part of the ecological research being conducted.	From 1300 m on the plain to 2800 m in the mountains to the east.	The range is classified as semidesert grassland. But it contains a complex of vegetation types ranging from nearly pure stands of grass, through savanna types with grass interspersed with by trees and shrubs to nearly pure shrub stands.	The range lies within the Chihuahuan Desert. There is a wide range of between day and night temperatures, low relative humidity and extremely variable precipitation. There are two precipitation peaks, summer and winter. *	The weather station in Las Cruces, although there is met station on site. The nearest radiosonde station is in El Paso, Texas, and possibly at the White Sands Test area to the east.	Landsat TM data from 1995 and 1996 with supporting ground measurements of reflectance and surface temperature and flux measurements.
Kansas-Oklahoma Border						
Mongolia						
North-West Pacific						
Palau						
San Pedro Basin	Various met, stream gage, and surface flux measuring stations maintained either all year or a fair part of the time	900 - 2900 m in upper basin (on US side)	Various biomes - desert plants, grasslands, savannah chapparal, forests (coniferous). Predominantly mixed grass-brush rangeland.	semi-arid*	Ft. Huachuca has daily radiosonde launches and is located within the basin. 10 met stations are also operated year round	Plentiful*
West Siberia						
South-East Asia						
Taklimakan Desert	National of Peoples of China	Approx. 1500 m	Arid, semi-arid and oasis.....vasrious vegetation coverage (%), 0% arid to 100% (oasis)	Precipitation: 50 mm - 100 mm/year	Hotan weather station	1970s-1980s (MSS data) and in the late 1980 TM, SPOT data). Surface reflectance and albedo data in 1990-1995

ASTER Cal/Val Test Sites

Site Name	Field equipment Measurement accuracy	Observation Requirement	Data processing requirements	Key words	Attachments	Cog I Planned Measurements
Mt. Fitton, Aus.	Field equipment includes that the microFTIR and IRIS. These combined with the laboratory spectrometers are suitable for validation. Planned round-robin ross calibration will ensure results. No other field equipment is required	Multispectral VNIR, SWIR and TIR airborne data (instrument yet to be determined but candiates include GER 789 channel, modified Geoscan Mk II, TIMS, MIVIS, OARS)	Processed to Ground radiance (all bands), Decorrelation Stretch (VNIR, SWIR adn TIR) and Emissivity (TIR only) products	Mount Fitton, Australia, Geology, Validation, Decorrelation Stretch, T-E Separation, Emissivity, TIMS, MIRACO2LAS, Field MicroFTIR (FES), CO2 laser		Airborne multispectral VNIR, SWIR and TIR coverage is required for simulation and validation of the ASTER decorrelation stretch products*
Great Barrier Reef						
Hokkaido						
Jornada Experimental Range				Sensible and Latent Heat Fluxes, Desert, Arid site		Supporting ground measurements of reflectance, surface temperature and flux measurements.
Kansas-Oklahoma Border						
Mongolia						
North-West Pacific						
Palau						
San Pedro Basin	Extensive*	Dense network of ground (in situ) measurements coordinated with aircraft overflights 1-2 times a year pre- and post-launch. Post launch observations coordinated with satellite flyover	Atmospherically corrected, digital values of surface radiance, reflectance, kinetic temperature, and emissivity	SAN PEDRO BASIN ARIZONA, EVAPOTRANSPIRATION MESOSCALE EXPERIMENT, SENSIBLE HEAT FLUX, LATENT HEAT FLUX		
West Siberia						
South-East Asia						
Taklimakan Desert	Surface reflectance and albedo using spectral radiometer	If possible in-flight with ground truth (vegetation cover, etc.).	If possible, path radiance	Vegetation Index, Percent Vegetation Cover, Vegetation Biomass		