ILRS

Governing Board Meeting

October 15, 2008
17:00-19:00

IBB Andersia Hotel
Poznan, Poland

ILRS Governing Board Meeting

IBB Andersia Hotel
Plac Andersa 3
61-894 Poznan, Poland

Wednesday, October 15, 2008
17:00-20:00

Agenda

1.	Opening Remarks (5 min.)	W. Gurtner
2.	Review of Elections/Election of GB Chair (5 min.)	M. Pearlman
3.	Selection of Working Group Chairs and Co-chairs (10 min.)	M. Pearlman
4.	ILRS Status/Action Items (15 min.)	M. Pearlman
5.	Working Group Briefs and Recommendations (5-10 min. each)	WG Chairs
	a. Analysis	E. Pavlis/C. Luceri
	b. Missions	G. Appleby
	c. Data Formats and Procedures	W. Seemueller
	d. Networks and Engineering (inc. Stanford Counter Tests)	G. Kirchner
	e. Transponders	J. McGarry
6.	Task Force Reports (5 min. each)	
	a. Communications	E. Pavlis
	b. Center-of-Mass Corrections	G. Appleby
7.	ILRS Special Issue in Journal of Geodesy (5 min.)	E. Pavlis
8.	GGOS Activities (5 min.)	M. Pearlman
9.	Current Issues (10 min.)	
	a. Station Performance	M. Pearlman
	b. Coping with Future Satellite Missions	W. Gurtner/M. Pearlman
10.	FAGS Membership	M. Pearlman
11.	New Business	W. Gurtner/WG Chairs
12.	Other Business	W. Gurtner

ILRS Governing Board

Ex-Officio Members:

Director, Central Bureau:	Mike Pearlman
Secretary, Central Bureau:	Carey Noll
President of IAG Commission I:	Zuheir Altamimi

Members Appointed or Elected by Organizations:

EUROLAS Network Representatives:	Giuseppe Bianco
	Werner Gurtner, Chair
NASA Network Representatives:	David Carter
	Jan McGarry
WPLTN Representatives:	Yang Fumin
	Hiroo Kunimori (Ramesh Govind)
IERS Representative:	Bob Schutz

Members Elected by their International Peers:

Analysis Representatives:	Erricos Pavlis
	Vincenza Luceri
Data Center Representative:	Wolfgang Seemueller
LLR Representative:	Juergen Mueller
At-Large Representatives:	Georg Kirchner
	Graham Appleby

Note: Names in () are new members elected in fall 2008

Former Members:

Francois Barlier (former At-Large Member, 1998-2000)
Gerhard Beutler (former CSTG President, 1998-1999)
John Bosworth (former Director, ILRS Central Bureau, 1998-2001)
John Degnan (former Chairman and NASA Network Representative, 1998-2002)
Richard Eanes (former Analysis Center Representative, 1998-2000)
Yang Fumin (former WPLTN Network Representative, 1998-2002)
Ben Greene (former WPLTN Network Representative, 2002-2006)
Hiroo Kunimori (former WPLTN Network Representative, 1998-2008)
John Luck (former At-Large Member, 1998-2002)
Ron Noomen (former Analysis Center Representative, 1998-2006)
Wolfgang Schlueter (former EUROLAS Network Representative, 1998-2002)
Ulrich Schreiber (former At-Large Member, 2002-2006)
Peter Shelus (former LLR Representative, 1998-2006)
Hermann Drewes (former President of IAG Commission I/CSTG, 1998-2007)

ILRS Status Review

Network Status:

- 33 stations regularly providing tracking data in 2008
- Most productive stations are Yarragadee, San Juan, Mt. Stromlo, Graz, Wettzell, Zimmerwald, Herstmonceux, Riyadh, and Changchun
- Newly refurbished Grasse MEO station on-line soon
- Tahiti now operational; meeting with NASA, CNES, and UFP to be held October 20-22, 2008
- FTLRS completed Jason calibration/validation campaign in Burnie, Tasmania; now operational in Ajaccio
- TROS to operate at KASI, Korea for one year tracking campaign in 2008

Mission Developments:

- Supporting 27 missions and lunar tracking
- GIOVE-B launched on April 27, 2008; first intensive tracking campaign now underway
- ANDE-Passive re-entered in May 2008; a few stations were able to track down below 300 km (good omen for GOCE)
- Two-month campaign on GPS-35 and -36 completed; GPS-35 will soon be decommissioned
- COMPASS-M1 mission support request submitted on 09/24/2008
- ILRS GB approved support for GOCE (gravity field); scheduled for launch on October 5 (may slip due to some launch vehicle issues)
- OICETS campaign scheduled for October 2008-February 2009
- QZS-1 (test for Japanese Navigation satellite system) approved for ILRS tracking; launch in 2009
- LRO launch now scheduled for early 2009
- New Mission Support Request form under review by ILRS CB

Meetings:

- November 11-15, 2008: Ocean Surface Topography Science Team (OSTST) and IDS Workshops, Nice France
- December 15-19, 2008: Fall AGU, San Francisco CA
  - December 14, 2008: GGOS Steering Committee Meeting
  - December 17, 2008: GGOS Ground Networks and Communications WG Meeting
- April 19-24, 2009: EGU General Assembly, Vienna Austria
- August 31-September 04, 2009: IAG Scientific Assembly, Buenos Aires Argentina
- 2011: IUGG General Assembly, Melbourne Australia

Remaining GB Action Items:

- **Vienna, Austria (April 16, 2007):**
  1. Draft an ILRS retroreflector standard for GB action. (Pearlman) *(assigned 04/2007; done)*
- **Grasse, France (September 28, 2007)**
  1. Randy Ricklefs and the Data Formats and Procedures WG will draft an implementation plan for the CRD format for review at the EGU meeting in Vienna in April 2008 (Ricklefs) *(assigned 09/2007; done)*
- **Vienna, Austria (April 14, 2008)**
  1. G. Bianco and V. Luceri will provide MLRO range bias correction tables and document the system's problems in 2007 for the ILRS Web site and SLRMail. (Bianco, Luceri) *(assigned 04/2008; done)*
  2. The editorial board will develop a table of contents for the ILRS special issue for the Journal of Geodesy. *(assigned 04/2008)*
  3. The CB will contact the other two stations to ascertain their interest in participating in Stanford Counter testing. *(assigned 04/2008)*
  4. The ILRS must provide input material for the NRC Committee. *(assigned 04/2008; done)*

ILRS Status Review (continued)

ILRS Membership in FAGS:

- Federation of Astronomical and Geophysical Data analysis Services (FAGS)
- H. Drewes (on behalf of IAG/IUGG) has requested ILRS apply for membership to FAGS
- Current IAG services in FAGS: IERS, IGS, IVS, PSMSL, BGI, ICET
- Provides endorsement from International Council for Science (ICSU) to services and data systems
- In near future, FAGS and World Data Centers (WDC) will merge into World Data System (WDS)
- IUGG would like IAG services to apply for membership to FAGS prior to final approval of WDS
- IUGG approves applications to FAGS; has indicated that applications from existing IAG Services will be approved
- Requires representation at yearly meetings
- May require FAGS representation on ILRS Governing Board (=> update of Terms of Reference)

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  7. The CB will contact the other two stations to ascertain their interest in participating in Stanford Counter testing. *(assigned 04/2008)*
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NGSLR Developments:

- Have ranged to most LEOs, both LAGEOS satellites, as well as GLONASS-95 with eyesafe 2khz laser.
- Have ranged to many LEOs, both LAGEOS satellites, GLONASS and ETALON with LRO laser (still not GPS).
- Point-ahead problems have been resolved - we expect to start daylight ranging shortly.
- Issues with ground calibrations have delayed start of co-location with MOBLAS-7. We now expect co-location to happen December 2008.
- Two full-time operators are onboard but are currently spending much of their time at MOBLAS-7.
- Need to complete the process of requesting entry into ILRS (i.e., filling out the logs).
- Closed-loop tracking is still being worked in background. Highest priority is co-locating.

ILRS Status Review (continued)

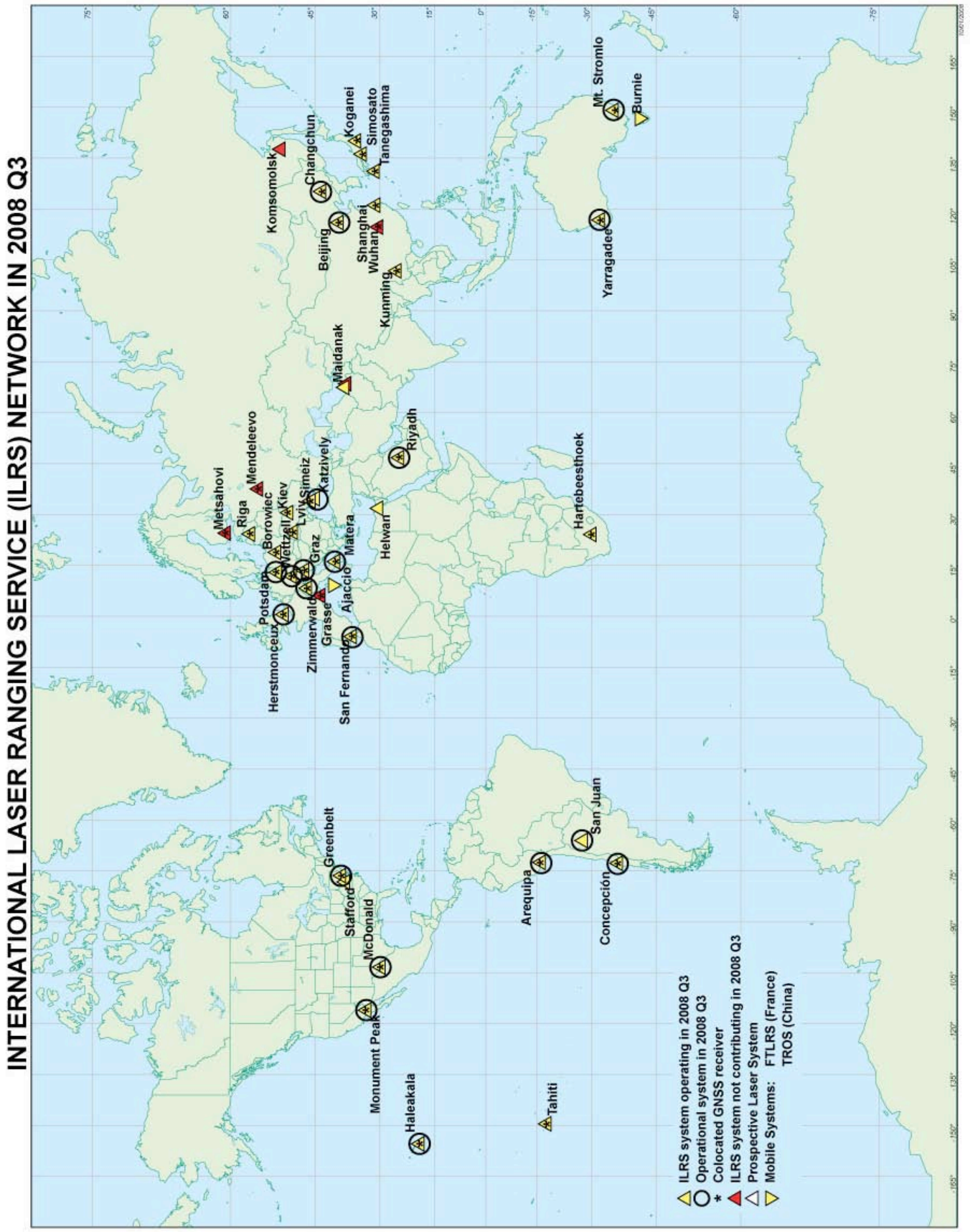
LRO-LR Developments:

- LRO launch is now late April 2009.
- Call for participation received 2 formal responses: Zimmerwald and Herstmonceux. Both stations have been accepted by the selection committee. Hopefully response memo will have gone out to both stations by the time these notes are read.
- Wettzell is expected to turn in a formal response.
- Matera and Mt Stromlo may turn in responses to the "Call". Have had discussions with both but still unclear.
- There are potential damage issues to LOLA with all of the stations (except for Herstmonceux) which must be discussed with each station.
- Predictions (CPFs) will be provided by GSFC. Data from stations must be delivered in CRD format. Go/NoGo flag provided by the mission will be in ILRS specified form and function.
- Stations that are ranging to LRO synchronously will be provided with routines to make use of the LRO clock and LOLA earth window information.
- We are working on an "upgrade" to the MOBLAS systems which will allow MOB-5 and MOB-6to participate in LRO-LR.
- Real-time LRO-LR website is up and has been tested with spacecraft. End-to-End testing with NGSLR, LOLA, LOLA-SOC and LRO was performed in late August.
- Hope to have several tests with all participating stations in late 2008 and early 2009.

GPS Tracking Campaign Status

March 25 – May 31, 2008

Site Name	Station	Start Date	End Date	Number Passes	Number Normal Pts.	Number Minutes
Beijing	7249	25-Mar-08	25-Mar-08	1	3	15
Changchun	7237	24-Apr-08	31-May-08	4	16	80
Graz	7839	25-Mar-08	31-May-08	33	278	1,390
Greenbelt	7105	25-Mar-08	05-May-08	2	4	20
Herstmonceux	7840	27-Mar-08	22-May-08	23	73	365
Katzively	1893	05-May-08	05-May-08	1	6	30
Koganei	7308	27-Mar-08	31-Mar-08	2	9	45
Matera	7941	14-Apr-08	14-Apr-08	1	6	30
McDonald	7080	14-Apr-08	30-May-08	12	54	270
Monument Peak	7110	28-Mar-08	15-Mar-08	4	9	45
Mount Stromlo	7825	01-Apr-08	29-May-08	13	49	245
Riyadh	7832	25-Mar-08	12-May-08	19	94	470
San Juan	7406	25-Mar-08	29-May-08	52	322	1,610
Simeiz	1873	23-May-08	24-May-08	2	50	250
Tanegashima	7358	26-Mar-08	18-May-08	20	103	515
Wettzell	8834	13-Apr-08	15-May-08	18	79	395
Yaragadee	7090	25-Mar-08	28-May-08	41	146	730
Zimmerwald	7810	19-Apr-08	13-May-08	15	61	305
Totals:	18 stations			263	1,362	6,810


INTERNATIONAL LASER RANGING SERVICE (ILRS) NETWORK IN 2008 Q3
Komsomolsk
Changchun
Koganei
Simosato
Tanegashima
Beijing
Shanghai
Wuhan
Kunming
Mt. Stromlo
Burnie
Yarragadee
Maidanak
Riyadh
Hartebeesthoek
Metsahovi
Mendeleevo
Riga
Borowiec
Kiev
Lviv
Simeiz
Katzively
Helwan
Matera
Graz
Ajaccio
Potsdam
Grasse
Zimmerwald
Herstmonceux
San Fernando
Greenbelt
Stafford
McDonald
Monument Peak
Haleakala
Arequipa
San Juan
Concepción
Tahiti
ILRS system operating in 2008 Q3
Operational system in 2008 Q3
Colocated GNSS receiver
ILRS system not contributing in 2008 Q3
Prospective Laser System
Mobile Systems: FTLRS (France)
TROS (China)

ILRS 2008 Q3 Quarterly Report Card (Table 1a, 10/01/2007-09/30/2008)

Site Information		Data Volume									Data Quality		
Column 1	2	3	4	5	6	7	8	9	10	11	12	13	14
Location	Station Number	LEO pass Tot	LAGEOS pass Tot	High pass Tot	Total passes	LEO NP Total	LAGEOS NP Total	High NP Total	Total NP	Minutes of Data	Cal. RMS	Star RMS	LAG RMS
Baseline		1000	400	100	1500								
Yarragadee	7090	10045	2040	1393	13478	211044	26388	12766	250198	170300	4.7	8.9	9.5
San_Juan	7406	5752	1211	1407	8370	91500	14474	9383	115357	101016	11.3	12.8	13.6
Mount_Stromlo_2	7825	5972	1387	545	7904	80860	14535	4327	99722	76111	3.5	4.0	5.7
Graz	7839	4539	667	484	5690	88527	7245	3993	99765	57059	2.0	3.2	5.2
Wettzell	8834	4251	981	368	5600	46726	7566	1582	55874	38399	4.9	11.6	18.4
Herstmoncex	7840	3967	914	406	5287	61009	10886	1701	73596	46060	6.9	11.8	15.0
Changchun	7237	4001	536	503	5040	44749	4248	2520	51517	33714	13.5	13.3	15.1
Riyadh	7832	3319	780	396	4495	39796	6293	2213	48302	36113	9.3	12.8	15.5
San_Fernando	7824	3206	475	74	3755	47650	3669	378	51697	24246	6.2	11.7	15.1
Greenbelt	7105	2778	384	196	3358	62699	3917	1202	67818	29973	4.6	8.9	9.8
Matera_MLRO	7941	2336	646	76	3058	30781	6843	607	38231	27198	1.1	3.2	4.4
Concepcion_847 Concepcion_423	7405	1478 18	809 3	147	2434 21	17756 164	9835 11	979	28570 175	31525 94	5.0	11.1	14.1
Zimmerwald_423 Zimmerwald_532	7810	1628 2850	378 531	204 489	2210 3870	27539 52294	4525 7082	1370 4469	33434 63845	23273 49683	5.8	9.1	11.3
Zimmerwald_846	9810	1629	380	196	2205	28510	5249	1215	34974	24251			
Haleakala	7119	1769	429		2198	28991	4962		33953	18399	5.2	10.0	9.8
Beijing	7249	1712	236	158	2106	25491	2185	1229	28905	18607	9.0	17.6	22.0
Potsdam_3	7841	1784	301		2085	33665	3412		37077	15451	13.0	14.9	18.7
Arequipa	7403	1617	182		1799	20490	1092		21582	8294	5.3	7.7	5.9
McDonald	7080	1160	354	194	1708	13171	3404	798	17373	14682	10.8	12.5	13.7
Monument_Peak	7110	1336	290	64	1690	23682	3015	409	27106	14557	5.1	16.1	15.2
Katzively	1893	1094	214	145	1453	16887	1800	900	19587	13259	47.9	50.9	40.4
Hartebeesthoek	7501	1115	235	14	1364	12322	1656	63	14041	7599	5.6	8.7	8.8
Shanghai_2	7821	1114	111	27	1252	14311	1140	149	15600	7495	11.3	15.1	19.3
Simeiz	1873	846	269	96	1211	10749	2361	1371	14481	11212		52.2	53.2
Koganei	7308	668	208	67	943	9443	1920	837	12200	11397	9.9	13.2	15.3
Burnie_Tafe	7370	594	6		600	8278	25		8303	2807			
Kiev	1824	512	30		542	5685	176		5861	2139	24.8	25.4	37.2
Tanegashim	7358	285	61	72	418	4563	668	471	5702	4950	1.9	4.3	5.6
Kunming	7820	348	25		373	4870	166		5036	2004	11.5	21.0	
Riga	1884	305	59	1	365	6578	802	7	7387	3326	6.2	10.2	14.0
Ajaccio	7848	222	2		224	3873	14		3887	1276	5.0	10.5	13.0
Borowiec	7811	132	63		195	1748	631		2379	1833	17.7	22.4	30.9
Lviv	1831	155	24		179	2506	215		2721	1228	19.6	62.0	80.3
Papeete	7124	124	52	1	177	2128	704	16	2848	2121	3.3	7.5	8.4
Maidanak_1	1864	88	64	25	177	1151	581	89	1821	1928			
Helwan	7831	31			31	213			213	56	6.0		

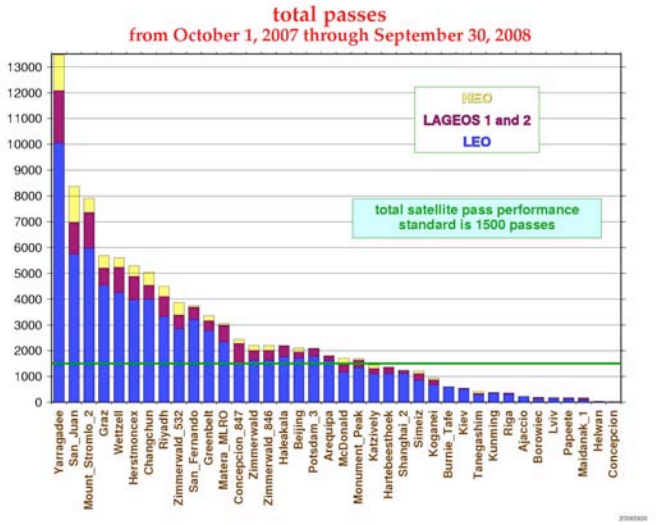
ILRS 2008 Q3 Quarterly Report Card (Table 1b Lunar, 10/01/2007-09/30/2008)
(continued)

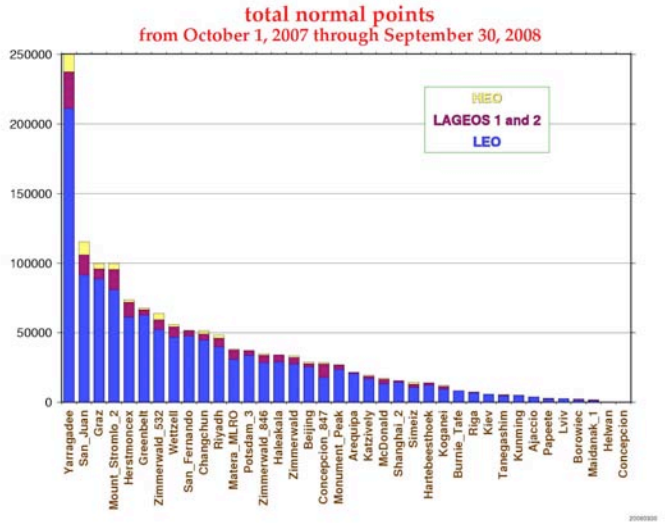
Site Information		Data Information			
Column L1	L2	L3	L4	L5	L6
Location	Station Number	num nights tracking last 12 mon	num npt last 12 mon	num npts last 3 mon	ave npt rms last 3 mon
McDonald	7080	40	84		

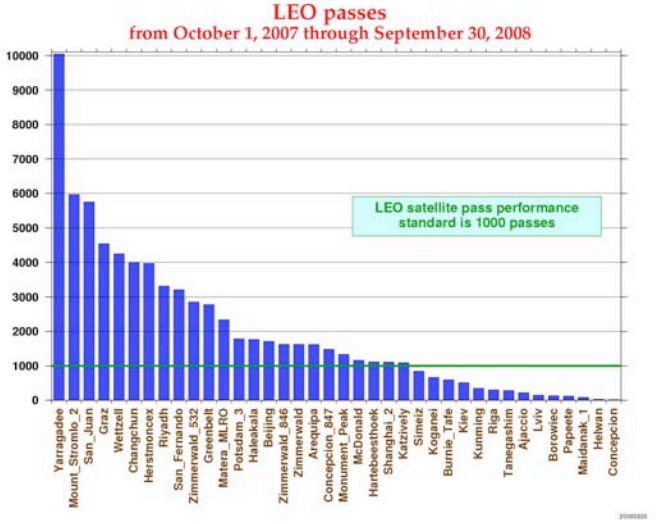
ILRS 2008 Q3 Quarterly Report Card (Table 2, 10/01/2007-09/30/2008)

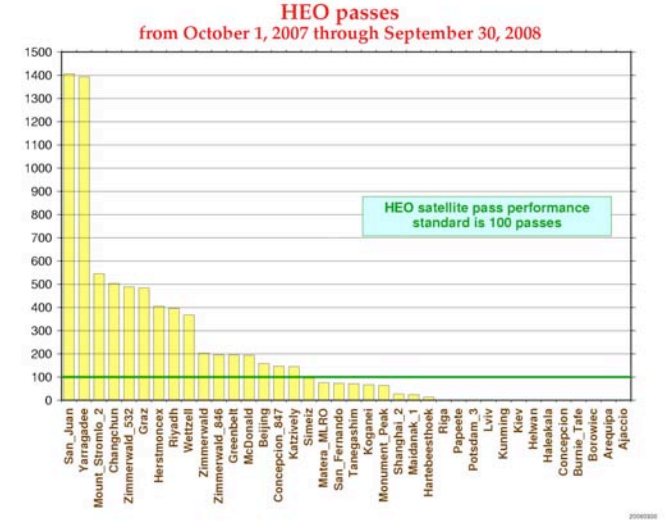
Site Information		DGFI Orbital Analysis				Hitotsubashi Univ. Orbital Analysis				JCET Orbital Analysis				MCC Orbital Analysis				SHAO Orbital Analysis			
Station Location	Station Number	LAG NP RMS (mm)	short term (mm)	long term (mm)	% good LAG. NP	LAG NP RMS (mm)	short term (mm)	long term (mm)	% good LAG. NP	LAG NP RMS (mm)	short term (mm)	long term (mm)	% good LAG. NP	LAG NP RMS (mm)	short term (mm)	long term (mm)	% good LAG. NP	LAG NP RMS (mm)	short term (mm)	long term (mm)	% good LAG. NP
Baseline		10.0	20.0	20.0	95	10.0	20.0	20.0	95	10.0	20.0	20.0	95	10.0	20.0	20.0	95	10.0	20.0	20.0	95
Yarragadee	7090	2.9	23.0	4.2	100.0	1.8	9.3	2.1	100.0	3.2	14.3	3.2	99.9	2.4	13.0	2.8	98.6	1.6	10.6	3.3	95.5
San_Juan	7406	6.1	29.7	4.6	99.1	3.8	20.4	9.0	99.3	5.5	17.7	3.7	93.3	5.9	21.9	11.9	96.2	4.8	21.8	6.7	95.3
Mount_Stromlo_2	7825	3.4	23.8	5.4	100.0	2.8	9.6	4.8	100.0	3.6	17.6	3.4	99.4	3.2	10.7	4.9	96.5	2.5	11.2	2.2	95.8
Graz	7839	2.0	23.1	3.3	100.0	1.2	8.8	3.0	99.8	2.6	18.6	4.5	99.6	1.5	9.4	3.8	98.6	0.8	9.5	2.6	97.2
Wettzell	8834	3.5	22.9	13.0	100.0	2.9	11.8	7.0	100.0	3.3	16.5	3.8	95.9	2.8	10.9	1.9	97.7	2.2	13.5	4.1	95.2
Herstmoncex	7840	3.1	15.1	3.8	100.0	2.0	7.4	1.9	100.0	3.4	16.0	4.5	99.4	2.9	7.9	1.9	98.0	1.7	10.2	2.0	95.0
Changchun	7237	6.0	33.8	12.4	99.9	5.2	17.7	14.7	99.9	5.1	15.6	8.1	91.9	5.2	23.5	8.0	95.8	3.9	20.4	13.2	95.1
Riyadh	7832	3.3	26.1	5.1	100.0	2.8	11.0	9.2	100.0	4.0	15.3	6.4	99.1	3.2	14.8	5.7	95.9	3.2	23.6	6.1	97.2
San_Fernando	7824	3.8	30.4	20.8	99.9	3.0	10.0	15.2	99.9	4.6	17.1	15.8	98.7	3.6	12.2	16.8	99.7	3.7	19.4	14.6	94.5
Greenbelt	7105	3.4	26.9	7.1	100.0	2.0	8.6	3.0	99.9	3.0	14.2	2.7	99.9	2.4	14.8	8.1	98.9	1.6	11.1	3.3	95.0
Matera_MLRO	7941	2.9	25.8	7.1	100.0	2.0	9.3	6.8	99.8	2.9	14.6	3.8	99.7	2.3	10.7	6.4	98.2	1.7	27.8	12.5	98.1
Concepcion_423 Concepcion_847	7405	2.5	32.9	5.8	100.0	1.5	18.6	5.6	100.0	3.9	18.4	5.2	100.0	2.0	27.6	3.8	100.0	1.5	27.4	14.9	97.3
Zimmerwald_423 Zimmerwald_846	7810	2.5	20.0	5.5	100.0	1.3	5.9	3.1	100.0	2.6	14.9	9.3	99.8	2.2	8.2	8.0	98.7	1.2	8.5	2.3	96.1
Haleakala	7119	3.5	25.8	6.3	100.0	2.6	11.1	3.8	100.0	3.6	17.0	3.6	97.5	3.5	19.3	13.1	99.0	3.1	26.5	11.2	97.5
Beijing	7249	13.4	34.8	16.9	94.8					6.7	27.7	12.2	92.4	8.4	42.1	24.8	93.1				
Potsdam_3	7841	5.9	24.2	10.6	100.0	4.1	10.8	7.5	100.0	5.0	17.6	5.6	97.1	3.2	6.9	3.9	91.9				
Arequipa	7403	5.2	44.9	29.4	100.0	2.8	55.1		100.0	6.5	32.7		49.8	3.1	16.4	9.1	95.0	2.4	15.1		95.6
McDonald	7080	3.5	22.9	6.8	99.5	2.9	9.8	7.7	100.0	3.5	16.3	3.9	100.0	4.3	24.5	11.2	96.9	2.7	13.0	6.7	98.8
Monument_Peak	7110	3.3	18.0	9.2	99.7	2.1	10.0	5.1	99.8	4.0	20.5	9.4	98.6	2.5	12.0	3.5	96.9	2.0	10.6	4.0	93.6
Katzively	1893	13.8	48.9	24.8	100.0					5.2	43.2		82.1	8.4	23.9	16.8	92.8	7.8	26.7	19.5	94.2
Hartebeesthoek	7501	3.0	30.6	10.7	100.0	2.5	16.0	18.7	100.0	4.0	20.0	15.0	98.9	2.8	16.5	7.8	98.7	2.1	19.2	11.6	97.4
Shanghai_2	7821	9.8	21.4		100.0	8.3	13.7	41.2	99.0	8.0	34.2		83.9	6.8	24.8	31.1	99.1	4.6	21.4		95.1
Simeiz	1873	52.8	52.2	36.4	83.3	78.5	46.6	25.2	99.2	5.7	25.9	11.0	27.9	55.9	49.3	14.2	81.3	23.6	28.0	11.2	51.6
Koganei	7308	5.3	20.8	8.4	100.0					4.7	12.0	4.8	95.8					4.3	37.2	7.6	95.6
Kiev	1824	22.4	53.1		97.1	19.3	42.6		97.0												
Tanegashim	7358	2.8	24.5	32.8	100.0	1.6	20.5		100.0	5.5	19.1		94.7								
Riga	1884	11.9	43.7		100.0	4.8	38.9		100.0	6.9	25.7		84.9	8.3	45.5		95.7	8.2	28.6		92.1
Borowiec	7811	11.1	26.1		100.0	9.1	8.1		100.0	7.9	19.6		93.0	8.1	12.2		94.5	7.4	14.5		91.8
Papeete	7124	3.0	16.2		100.0	1.6	10.9		100.0	2.9	13.6		99.7	2.1	12.3		100.0	3.9	23.3		98.1

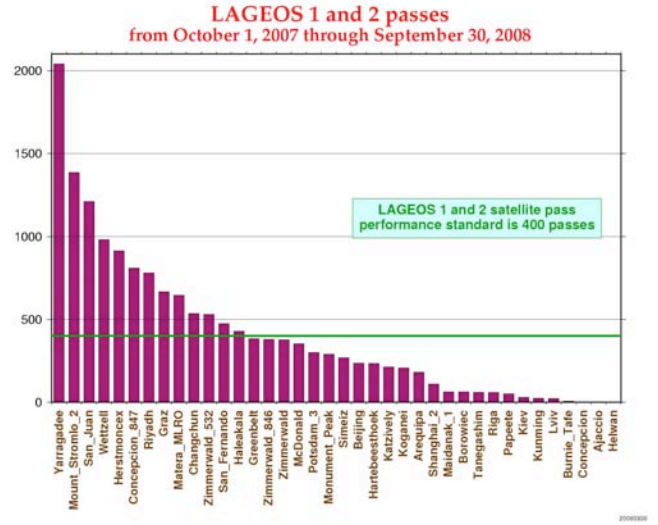
ILRS 2008 Q3 Quarterly Report Card Plots (10/01/2007-09/30/2008)

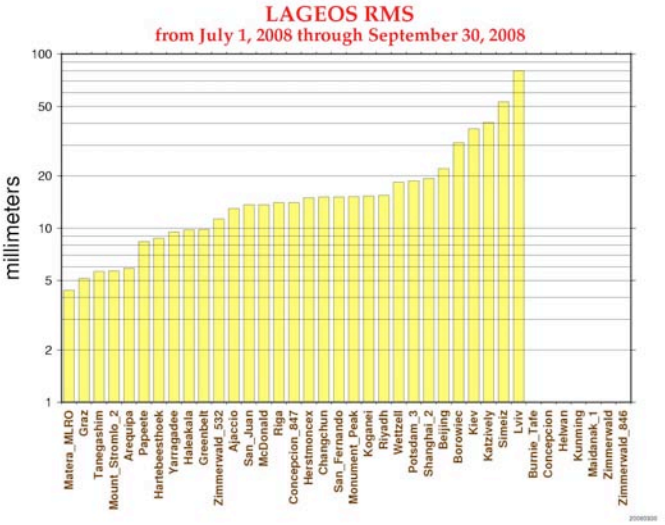




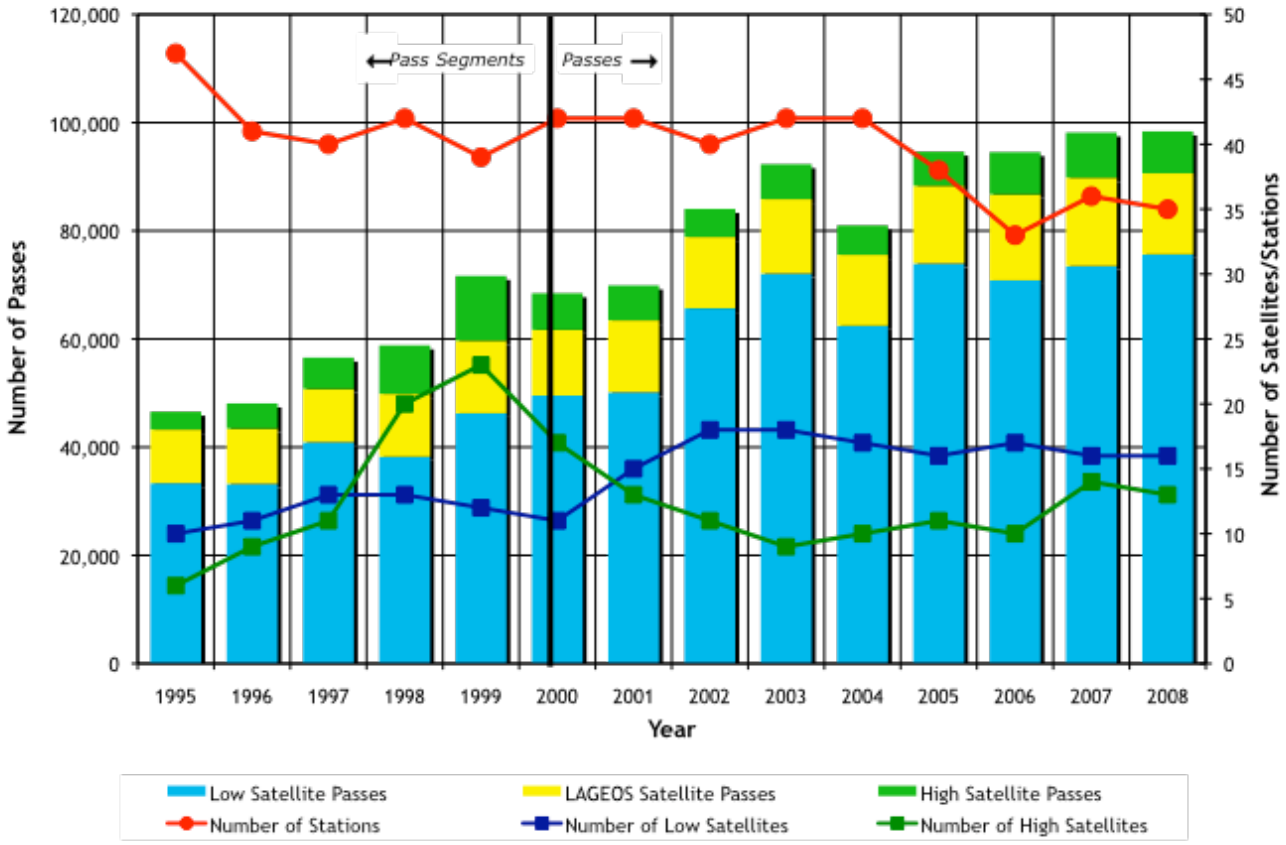








Global SLR Data Volume History (1995-2008)



**Note: 2008 totals based on 9 months of data prorated to full year for comparison purposes*