



COLLECTION REPORT – USGS LIDAR ACQUISITION

FEMA R6 AR Dardanelle Reservoir QL2 Lidar

28 March 2016

Prepared for

United States Geological Survey
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Fugro was tasked with planning, acquiring, processing, and producing derivative products of lidar data collected at 2 Points per Square Meter, for an Area of Interest (AOI) east of Fort Smith, Arkansas. The AOI covers approximately 2,116 square miles. A 100-meter buffer was added to the AOI covering approximately 2,132 square miles; all products will be generated to the limit of this buffered boundary.

Lidar data, and derivative products produced in compliance with the task order will be based on the “**U.S. Geological Survey National Geospatial Program Lidar Base Specification Version 1.2**”.

All acquisition occurred during leaf off conditions between December 18, 2015 and February 11, 2016 by Fugro.

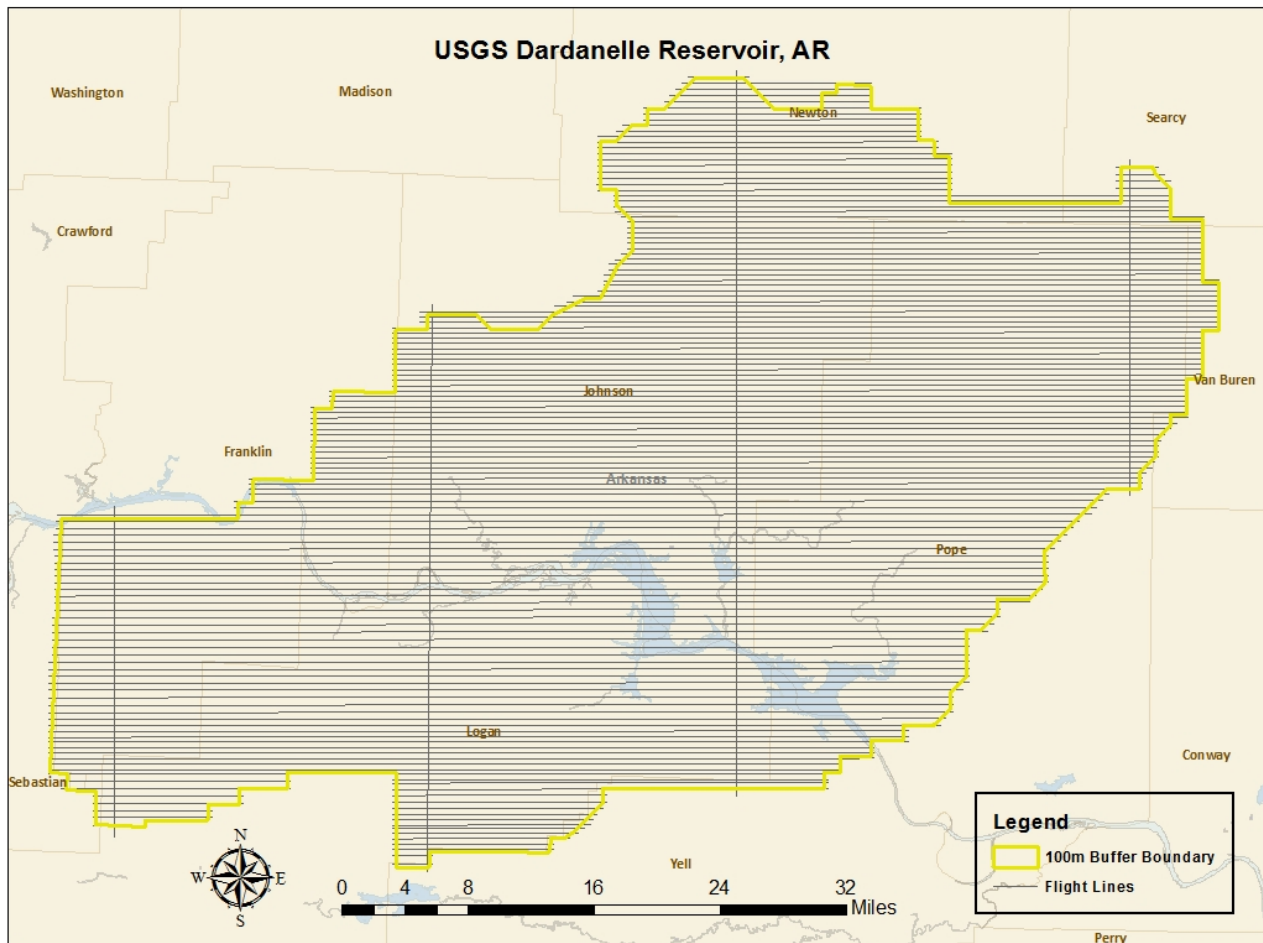


Figure 1: Flight plan

The following is detail on the lidar acquisition covering the Dardanelle Reservoir, Arkansas lidar buffered boundary.

Collections:	16
Collection Dates:	December 18, 2015 through February 11, 2016
Field of View (FOV):	60 degrees
Average Point Density (planned):	2 ppsm
Flight Level(s) AMT:	3400 ft
Sensor Type:	Riegl Q-680i
Sensor Serial Number(s):	165

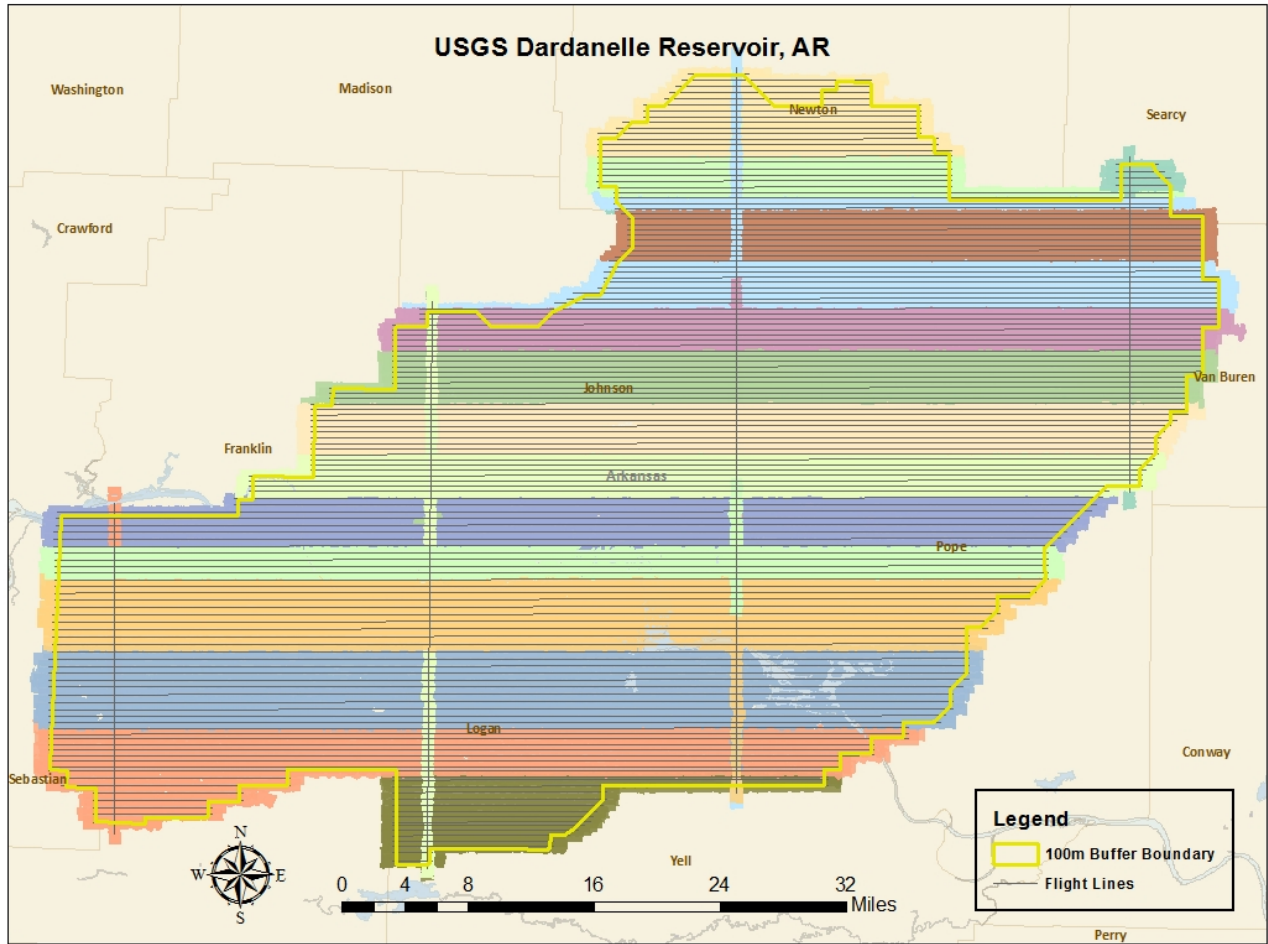


Figure 2: Executed Collection Footprints

All acquired lidar data was QC'd and accepted for processing.

Below are the acquisition logs and GPS plots from all collections covering the Dardanelle Reservoir, Arkansas lidar buffered boundary.



Acquisition and Processing details ----- Collection 1 (December 18, 2015)

Log:



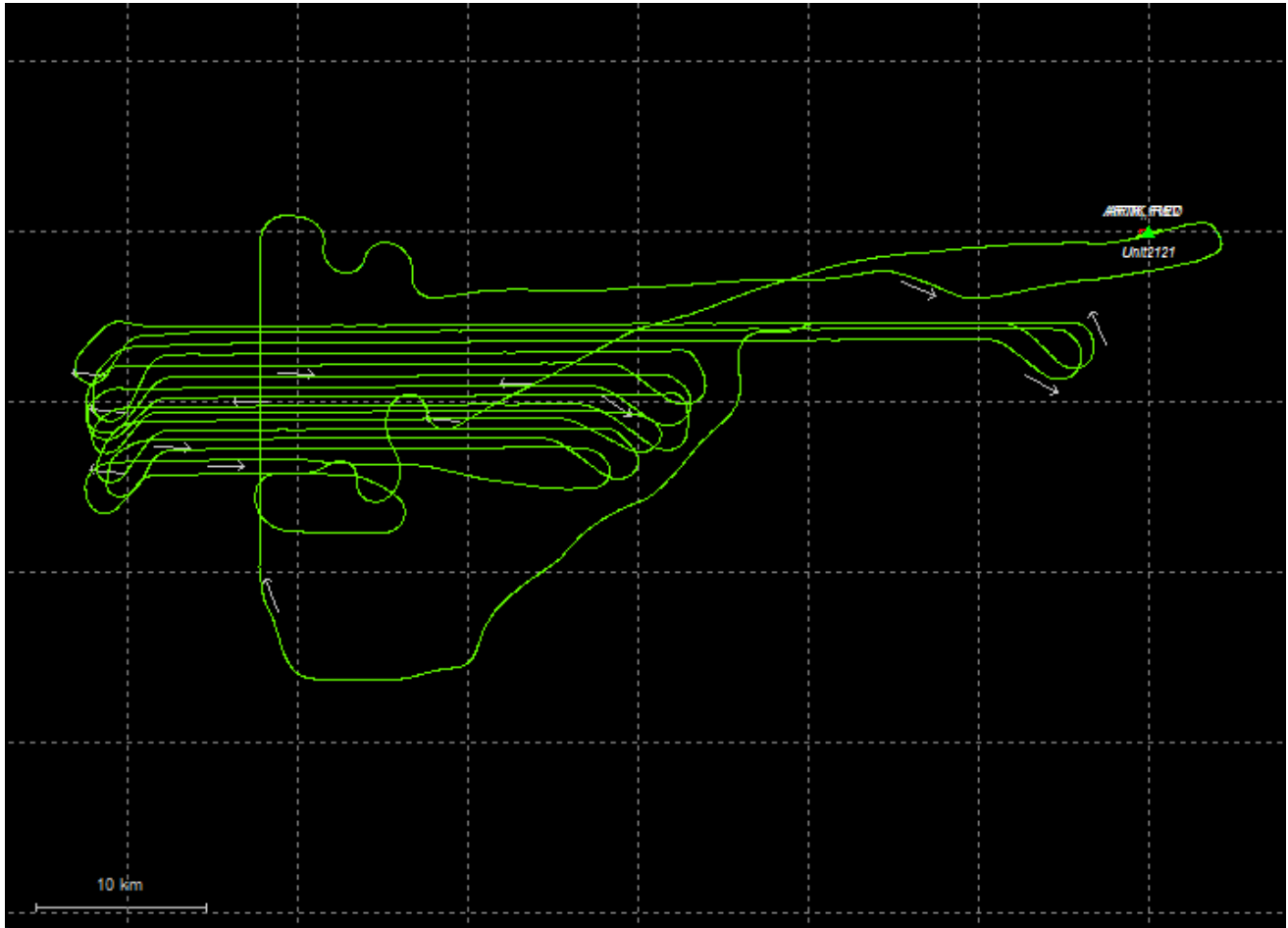
Fugro Geospatial, Inc.

15.2	Lift Begin			Lift End			Fit Duration	Fit Hrs	Hobbs Hrs	Activity
	Airport	Chocks	Hobbs	Airport	Chocks	Hobbs				
1	KRUE	15:31	9755.9	KRUE	19:35	9760.0	4:04	4.00	4.1	0900-Production
2										
3										

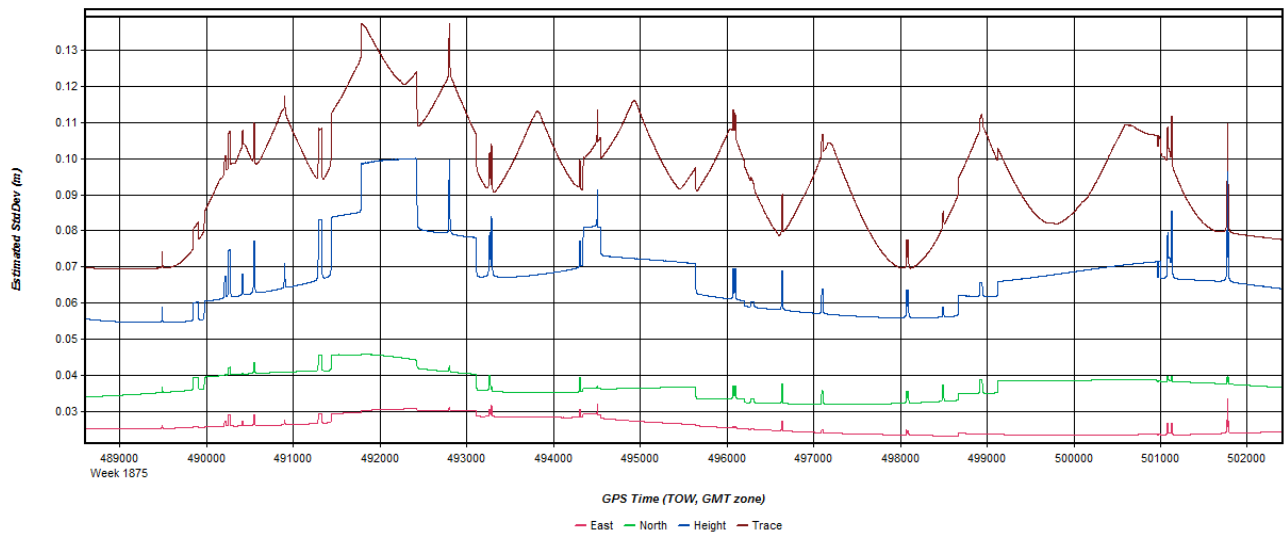
Q680i
Flight Log

FGI Job #	Project Name				Operator		Unit	IMU				Ground Temp °C	Min Range'	Data Logger Drives		
22.15005200	FEMA Dardanelle Reserv				Chris Acufia		165	-				3.0 6.0	2100	DR680-10		
Flight Date	GPS Day	Lift	System	Pilot		Sun*	Solar Times (UTC)		Pulse Rate			Flying Temp °C	Max Range'	Download Drive		
18-Dec-15	15-352	1	R680i	Kris Farrell		-			240000			-8.0 -4.0	4052	EP750#37		
Mission ID (yyymmdd_Sen_Job_Lift)	Aircraft	Airport ID	FMS	UTC	AMT (ft)	Speed	FOV	Scan Rate (Hz)	MTA	km/WPT	Alt Setting	Humidity @ Alt	Shipping Track			
151218_165_15005200_01	N62912	KRUE	CCNS 7	-6	3400	140	-	100	2	0.623	30.36 30.32	-	NA			
Base 1 ID	Location	Rec ID	Ant ID	ARP (m)	Start Time (UTC)		Stop Time (UTC)		GPS Filename			Operator		Data		
0202	KRUE	GR3Unit2	GR3Unit2	1.8	18-Dec-15 13:21		18-Dec-15 22:15		Unit21218n			Chris Acufia		With AB		
Area	Flight #	Client	Wpt	Distance		UTC		Dir	Altitude (GPS)	Speed (knots)	Scan Rate	Comments and Conditions			SVs	PDOF
				From	To	Begin	End					Start	End			
												5 min gnd static at KRUE				
												16:08:00 16:11:00 S-Turn in flight alignment			10	1.1
Area 1	8		8	1	4.4	0	16:17:00	16:19:00	265	-	120				9	1.4
	9		1	8	0	4.4	16:22:00	16:24:00	85	-	-				9	1.1
	10		28	1	16.8	0	16:30:00	16:34:00	266	3,806	125				10	1.1
	11		1	28	0	16.8	16:38:00	16:42:00	87	4,130	138				11	1.0
	12		31	1	18.7	0	16:46:00	16:51:00	267	3,881	122				10	1.3
	13		1	32	0	19.3	16:54:00	16:59:00	86	4,694	136				11	1.0
	14		33	1	19.9	0	17:03:00	17:08:00	265	4,012	132				9	1.1
	15		1	34	0	20.6	17:11:00	17:16:00	89	4,755	148				10	1.1
	16		34	1	20.6	0	17:21:00	17:26:00	265	3,986	133				10	1.0
	17		1	35	0	21.2	17:30:00	17:35:00	85	4,541	146				10	1.0
	18		36	1	21.8	0	17:39:00	17:45:00	266	3,922	125				10	1.1
	19		1	37	0	22.4	17:49:00	17:54:00	86	4,295	136				11	1.0
	20		37	1	22.4	0	17:58:00	18:04:00	268	4,140	138				11	1.0
	21		1	73	0	44.9	18:08:00	18:19:00	86	3,985	130				11	1.1
	22		73	1	44.9	0	18:22:00	18:33:00	268	3,961	135				11	1.1
	23		1	73	0	44.9	18:37:00	18:47:00	87	3,924	134				11	1.0
	23		73	63	44.9	38.6	18:51:00	18:53:00	267	3,706	133	Calibration Line			9	1.2
	51		1	22	0	13.1	19:05:00	19:08:00	1	3,880	131	Crossing Line			10	1.2
							19:09:00	19:12:00				S-Turn post in flight alignment			10	1.2
							19:26:50	19:31:50				5 min post gnd alignment at KRUE				

Trajectory and GPS Plots:

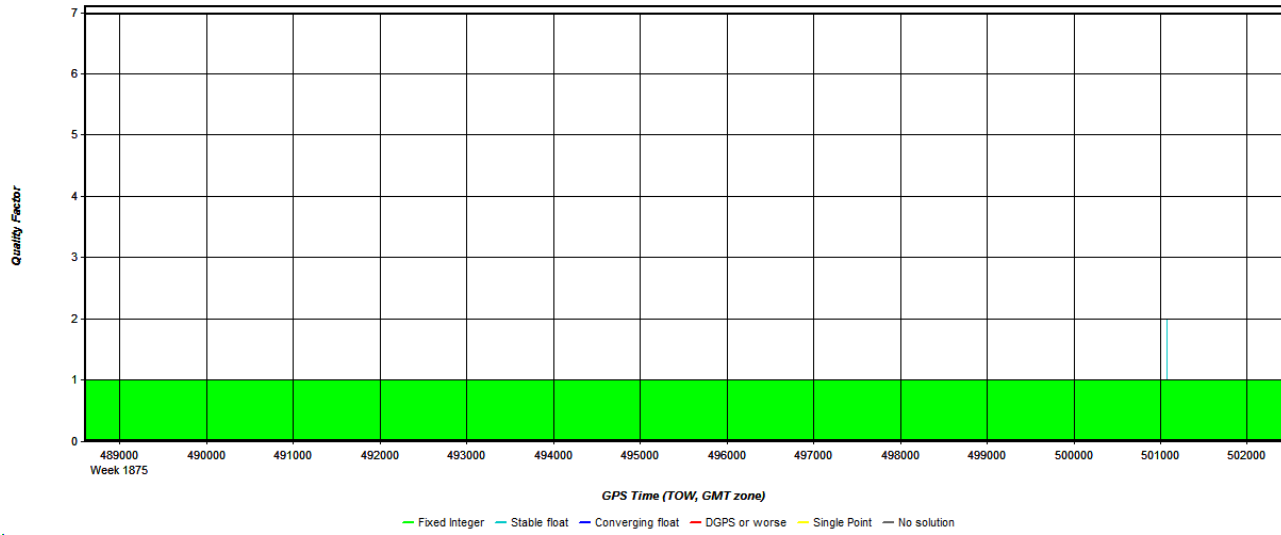


Estimated Accuracy

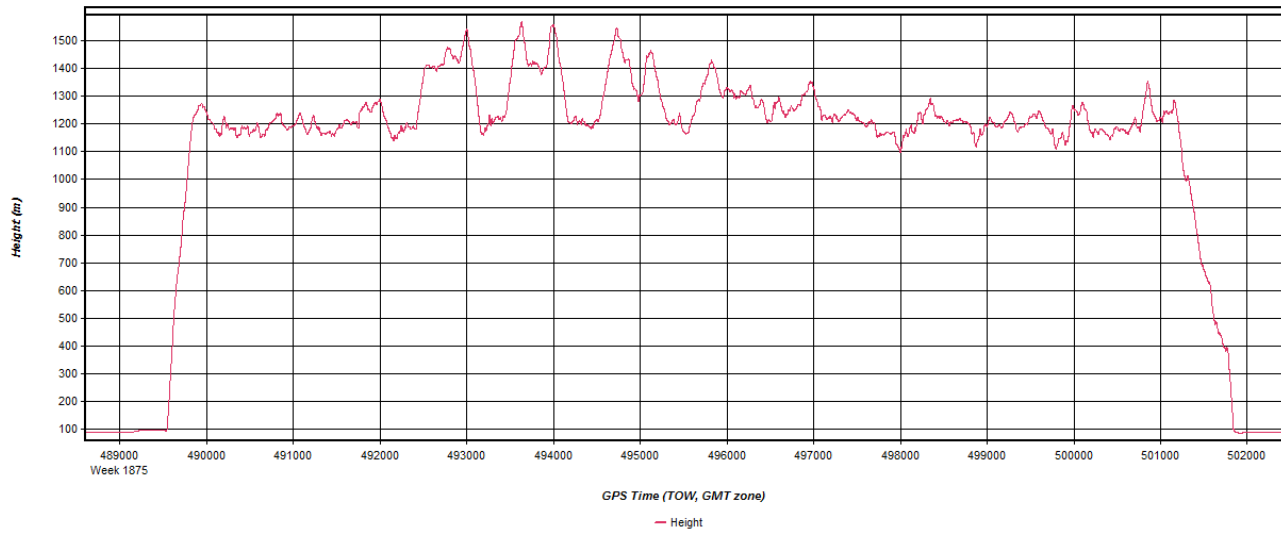




Quality Factor

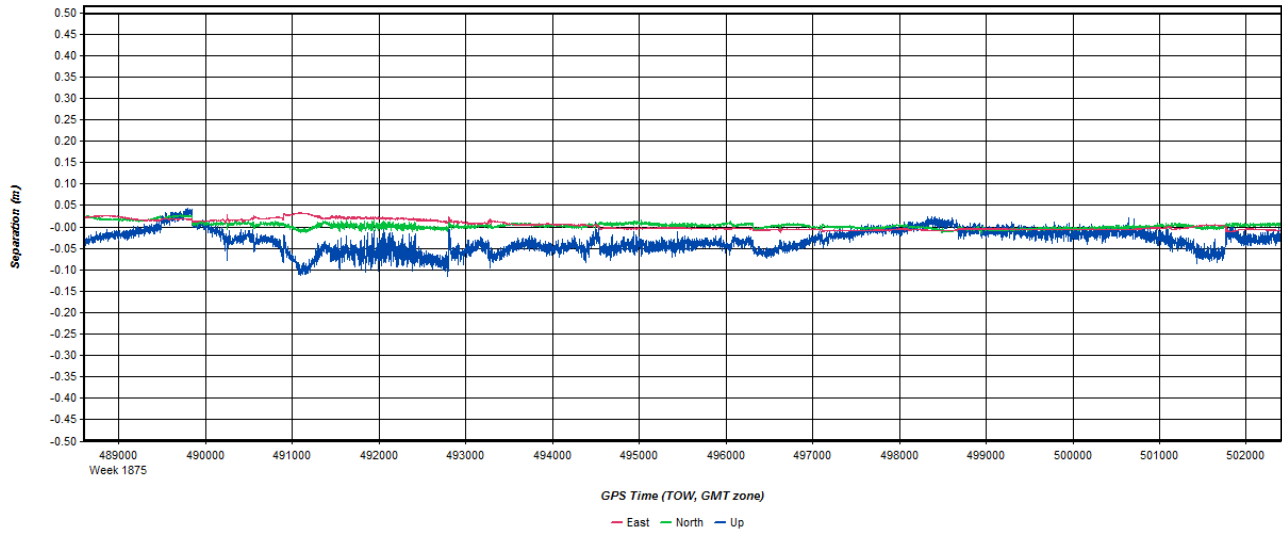


Height





Combined Forward/Reverse Separation

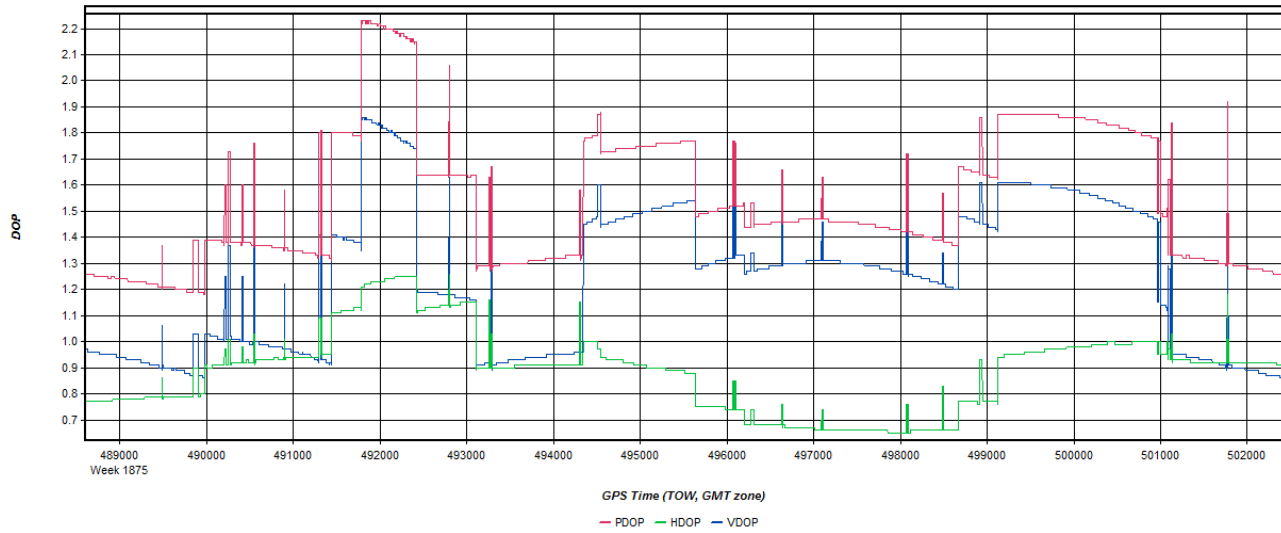


Combined Forward/Reverse Weighting

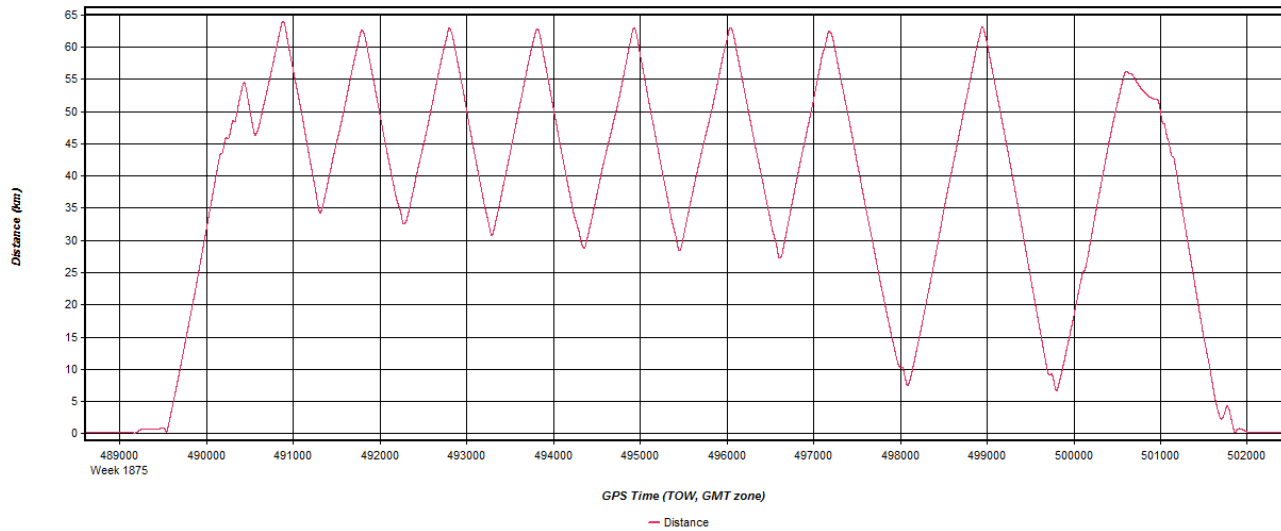




PDOP

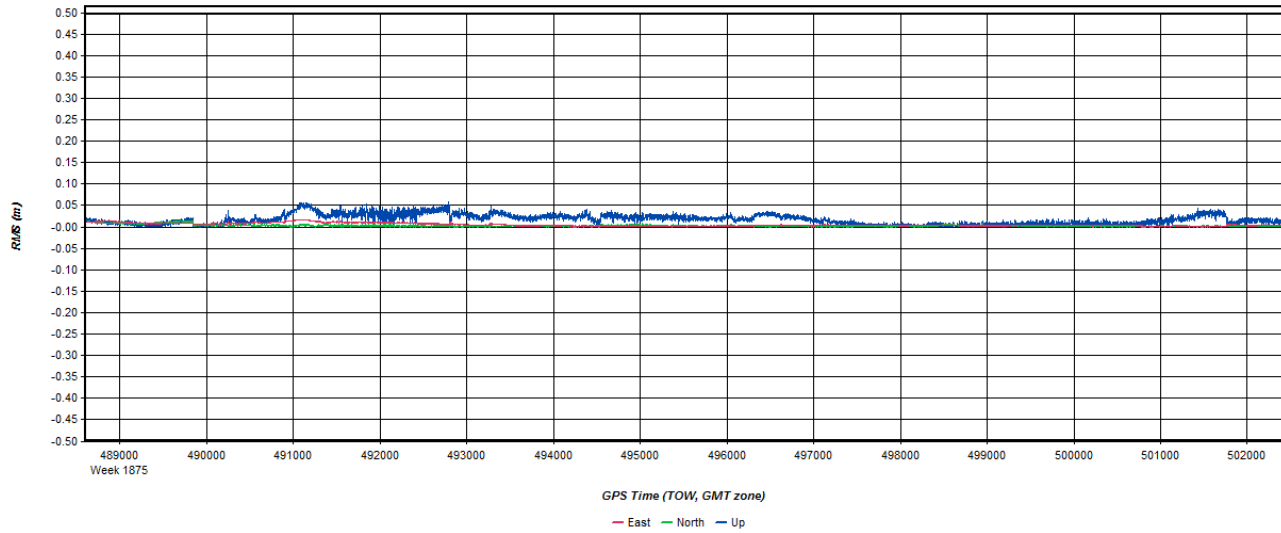


Distance from Base

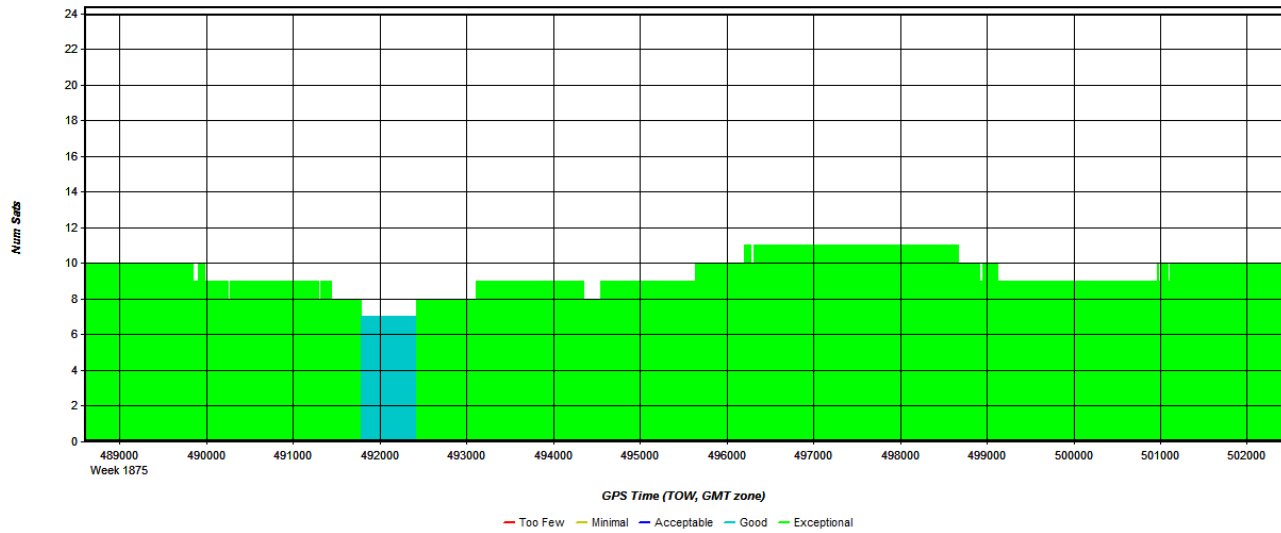




Combined RMS



SVs





Acquisition and Processing details ----- Collection 2 (January 27, 2016)

Log:



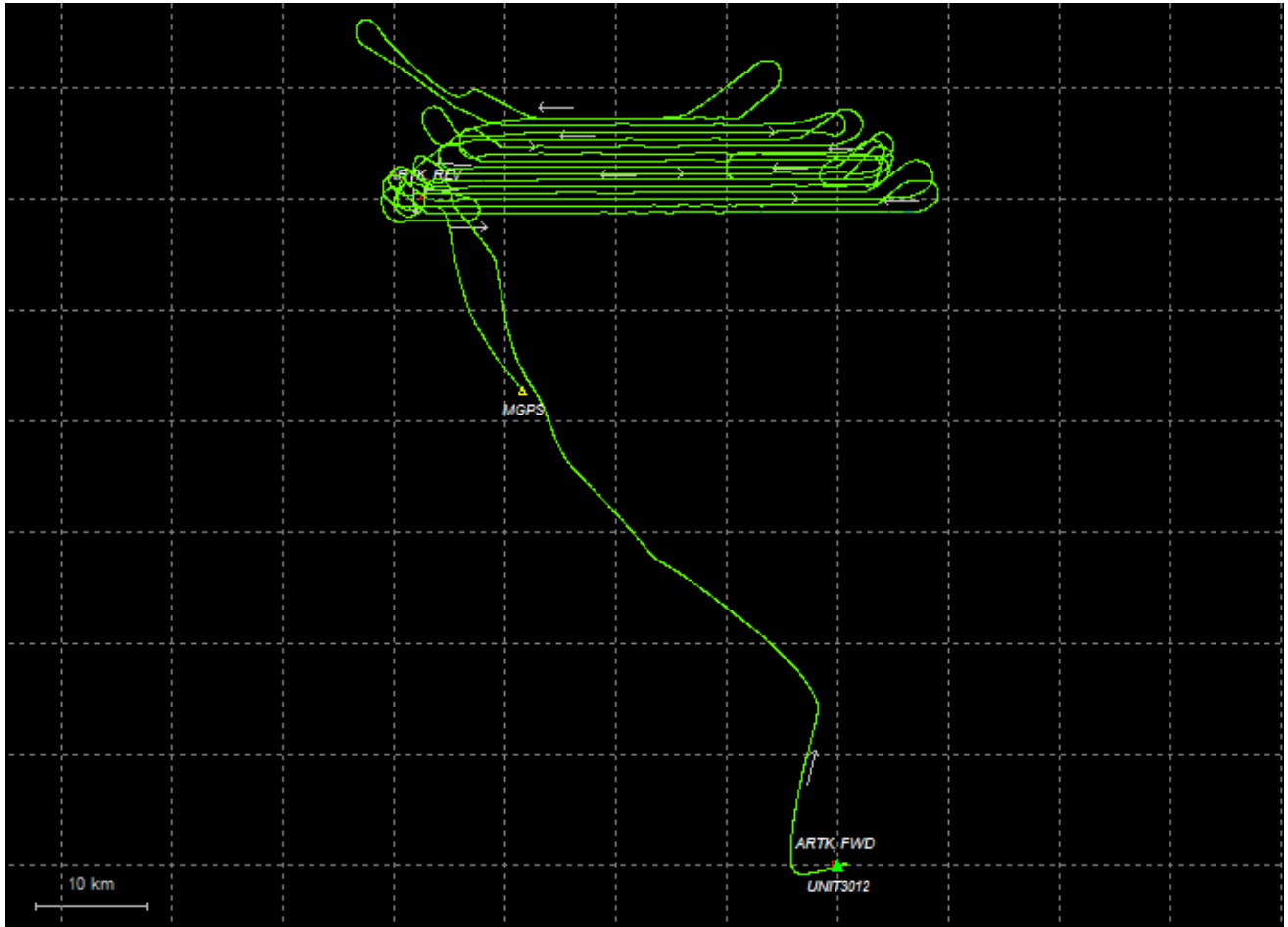
Fugro Geospatial, Inc.

15.2	Lift Begin			Lift End			Fit Duration	Fit Hrs	Hobbs Hrs	Activity
	Airport	Chocks	Hobbs	Airport	Chocks	Hobbs				
1	KRUE	19:20	9780.1	KRUE	23:10	9784.0	3:50	3.75	3.9	0900-Production
2										
3										

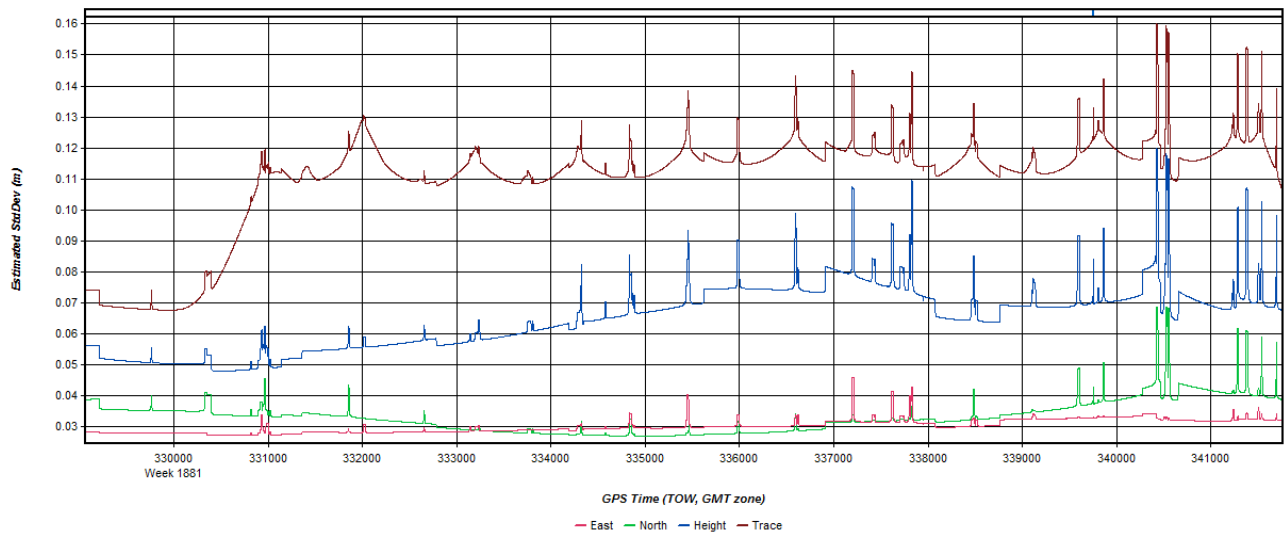
Q680i
Flight Log

FGI Job #	Project Name				Operator		Unit	IMU				Ground Temp °C	Min Range'	Data Logger Drives		
22.15005200	FEMA Dardanelle Reserv				Chris Acuña		165	-				7.0	2100	DR680-12		
Flight Date	GPS Day	Lift	System	Pilot		Sun*	Solar Times (UTC)		Pulse Rate			Flying Temp °C	Max Range'	Download Drive		
27-Jan-16	16-027	2	R680i	Corry Lane		-			240000			-3.0	4052	EP750#52		
Mission ID (yyymmdd_Sen_Job_Lift)	Aircraft	Ant ID	FMS	UTC	AMT (ft)	Speed	FOV	Scan Rate (Hz)	MTA	km/WPT	Alt Setting	Humidity @ Alt	Shipping Track			
160127_165_15005200_02	N62912	KRUE	CCNS 7	-6	3400	140	-	240K	2	0.623	30.20	-	NA			
Base 1 ID	Location	Rec ID	Ant ID	ARP (m)	Start Time (UTC)		Stop Time (UTC)		GPS Filename			Operator		Data		
0202	KRUE	GR3Unit3	GR3Unit3	1.8	27-Jan-16 18:39		27-Jan-16 23:42		UNIT30127s			Chris Acuña		With AB		
Area	Flight #		Wpt		Distance		UTC		Fit Dir	Altitude (GPS)	Speed (knots)	Scan Rate	Comments and Conditions		SVs	PDOP
	FGI	Client	From	To	Begin	End	Start	End								
													5 min gnd static at KRUE; (did run 5 min forgot to annotate)		-	-
													S-Turn in flight alignment		11	1.0
680TF2	45		1	11	0	6.2	19:59:00		88	4,943	181		Refly for speed		10	1.1
	45		11	1	6.2	0	20:07:00	20:08:00	267	4,901	145				10	1.1
	44		1	32	0	19.3	20:17:00	20:22:00	88	5,062	141		Rtns 99 to 100%		9	1.1
	43		33	1	19.9	0	20:25:00	20:30:00	268	4,983	136		Rtns 99 to 100%; Lgt turb		10	1.0
	42		1	34	0	20.6	20:35:00	20:40:00	87	4,600	144		Rtns 99 to 100%; Lgt turb		10	1.2
	41		35	1	21.2	0	20:44:00	20:49:00	268	4,732	137		Rtns 99 to 100%; Lgt turb		10	1.2
	40		1	46	0	28	20:52:00	20:59:00	87	4,800	141		Rtns 99 to 100%; Lgt turb		11	1.1
	39		46	1	28	0	21:02:00	21:09:00	268	4,619	142		Rtns 99 to 100%; Lgt turb		10	1.2
	38		1	46	0	28	21:11:00	21:18:00	89	4,691	146		Rtns 99 to 100%; Lgt turb		10	1.1
	37		50	1	30.5	0	21:20:00	21:28:00	266	4,617	139		Rtns 99 to 100%; Lgt turb		9	1.2
	36		1	51	31.2	0	21:30:00	21:38:00		5,016	146		Rtns 98 to 100%; Lgt turb		9	1.1
	36		51	41	31.2	24.9	21:41:00	21:42:00	266	4,715	144		Calibration Line		8	1.2
	35		54	1	33	0	21:51:00	21:59:00	268	4,562	133		Rtns 99 to 100%; Lgt turb		9	1.2
	34		1	57	0	34.9	22:01:00	22:09:00	89	5,054	139		Rtns 99 to 100%; Lgt turb		8	1.1
	33		57	1	34.9	0	22:13:00	22:22:00	268	4,430	142		Rtns 99 to 100%; Lgt turb		8	1.1
	32		1	59	0	36.1	22:24:00	22:33:00	88	5,073	145		Rtns 97 to 100%; Lgt turb smoke from controlled burn rtns 93 to 97%		8	1.2
	31		59	1	36.1	0	22:36:00	22:45:00	268	4,953	145		Rtns 97 to 100%; Lgt turb smoke from controlled burn rtns 93 to 97%		9	1.0

Trajectory and GPS Plots:

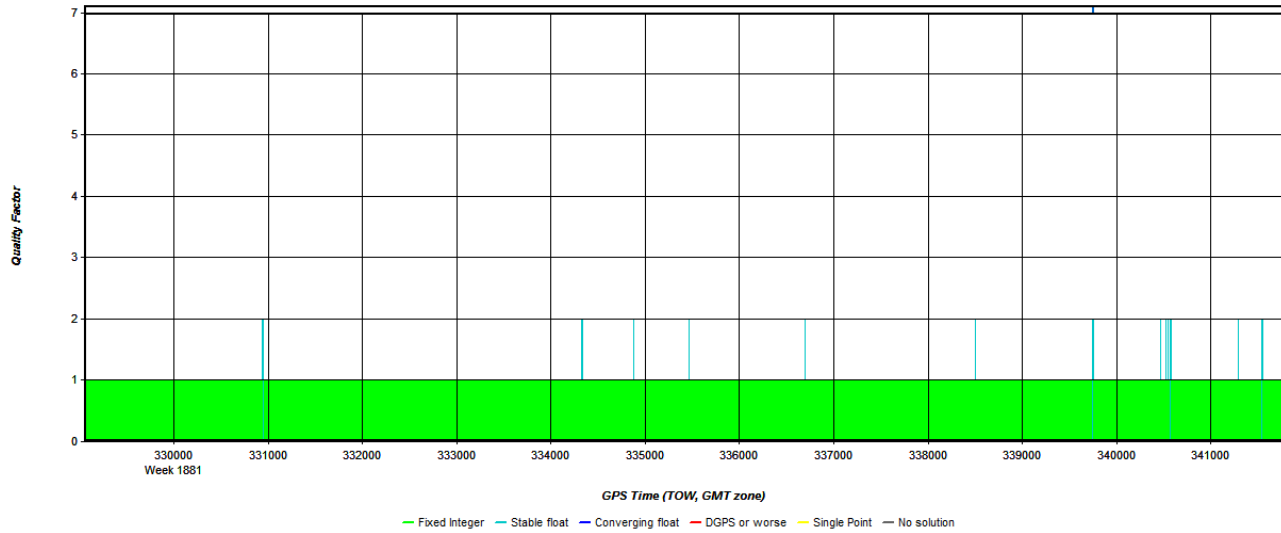


Estimated Accuracy

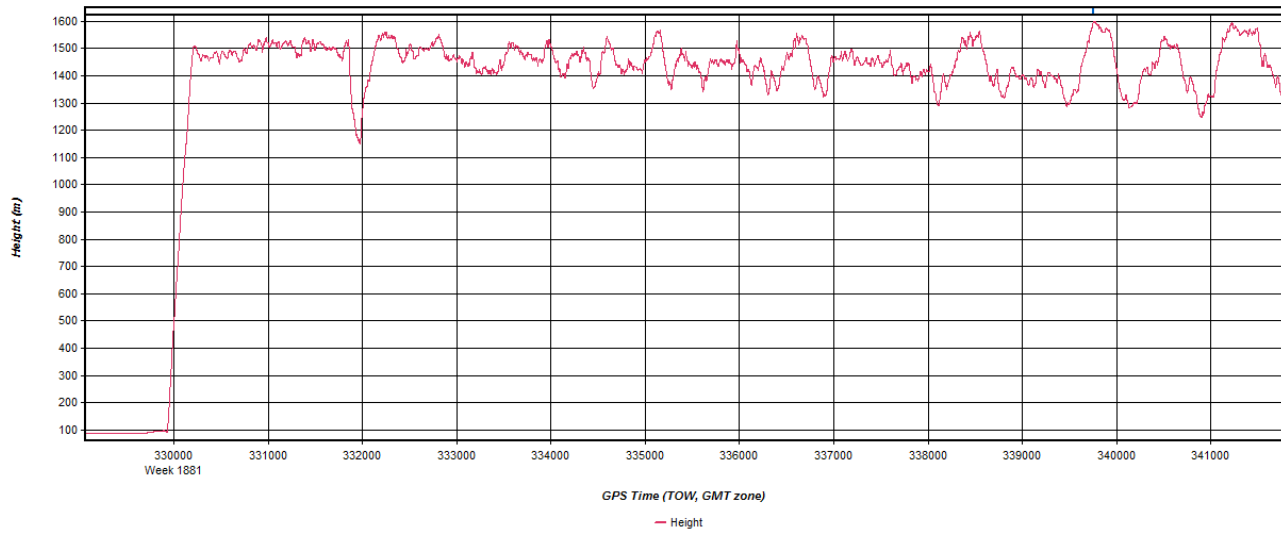




Quality Factor

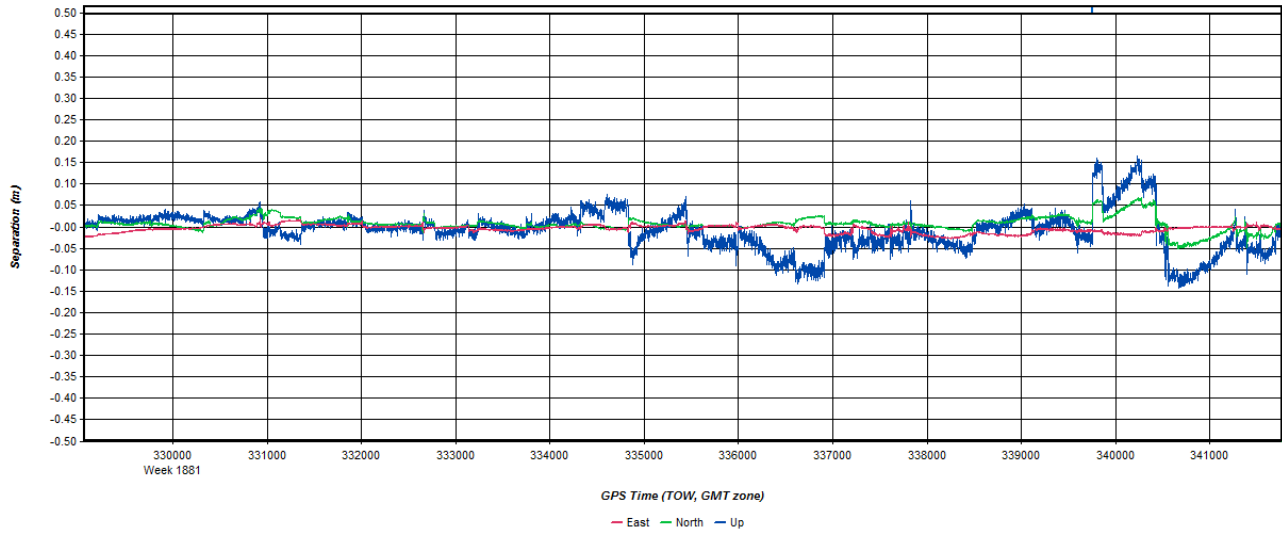


Height

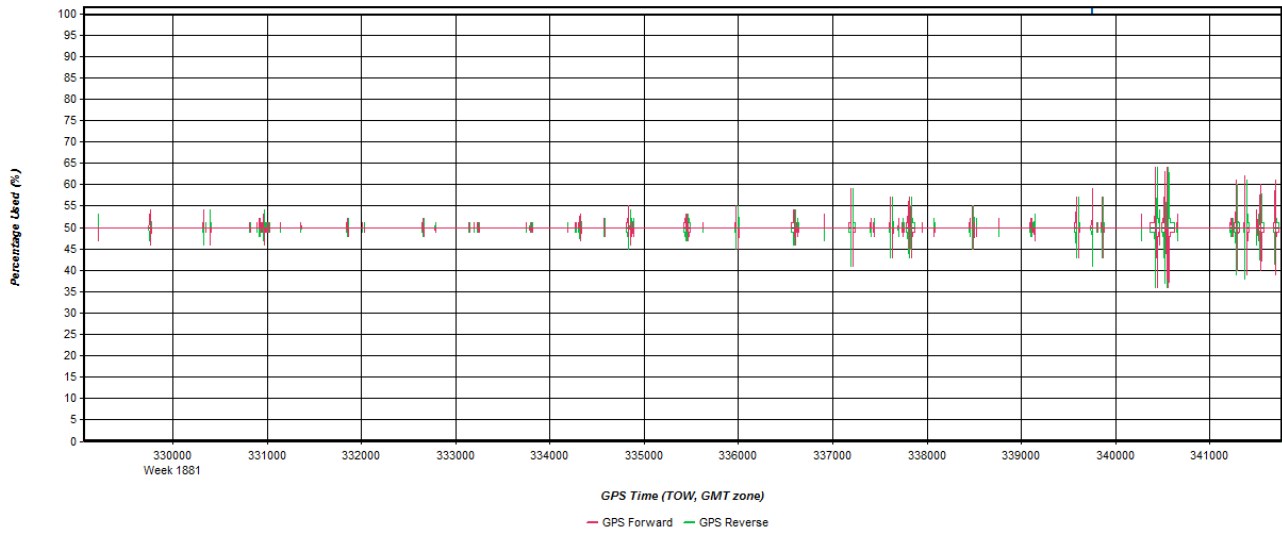




Combined Forward/Reverse Separation

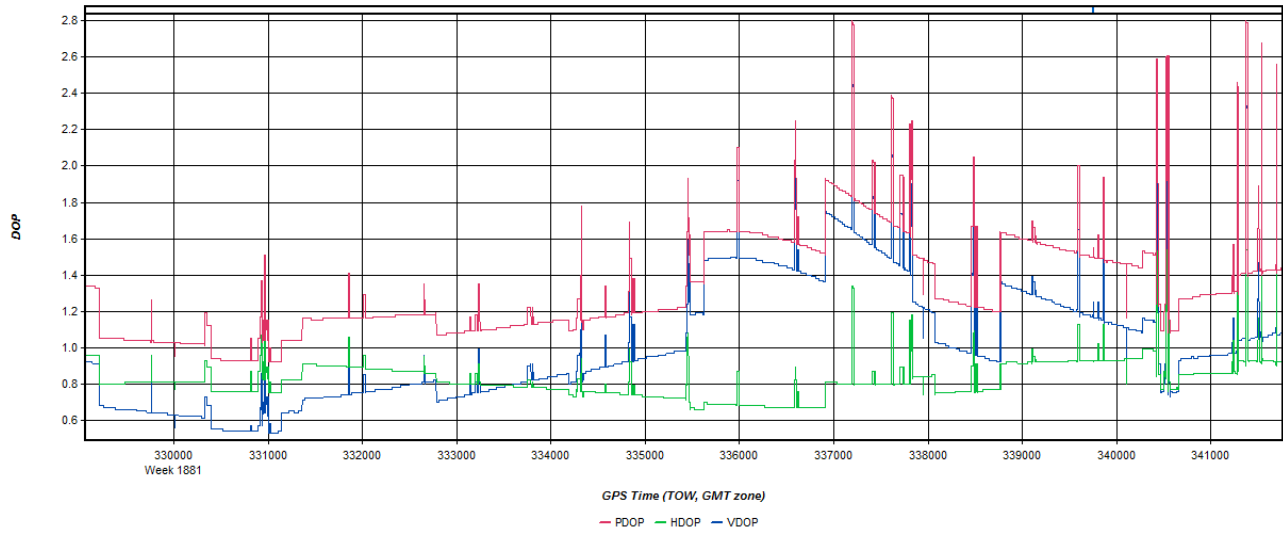


Combined Forward/Reverse Weighting

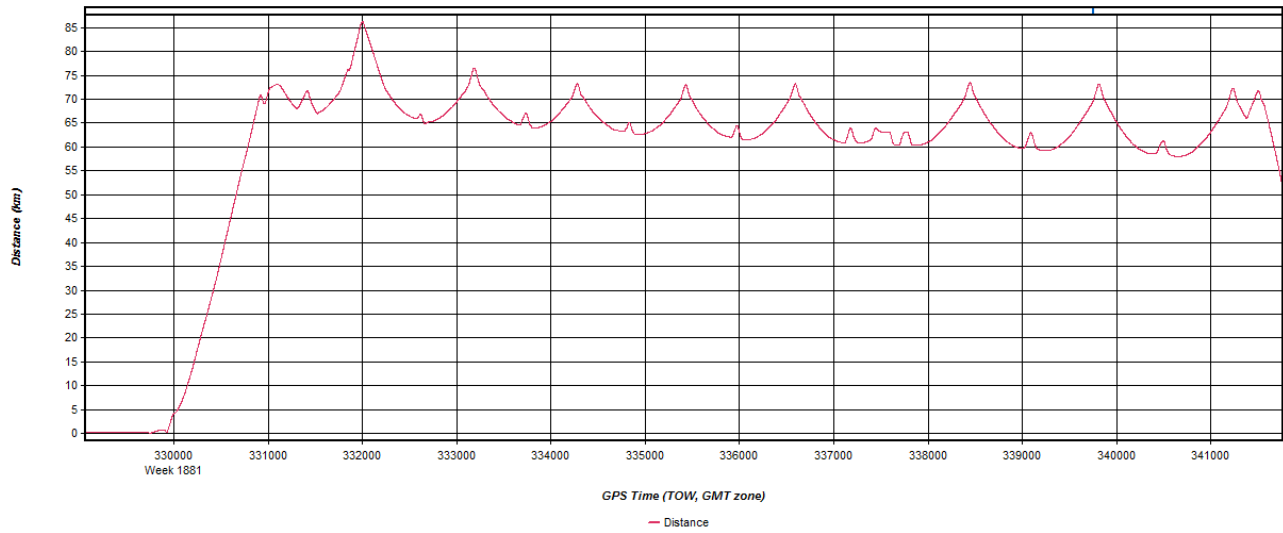




PDOP

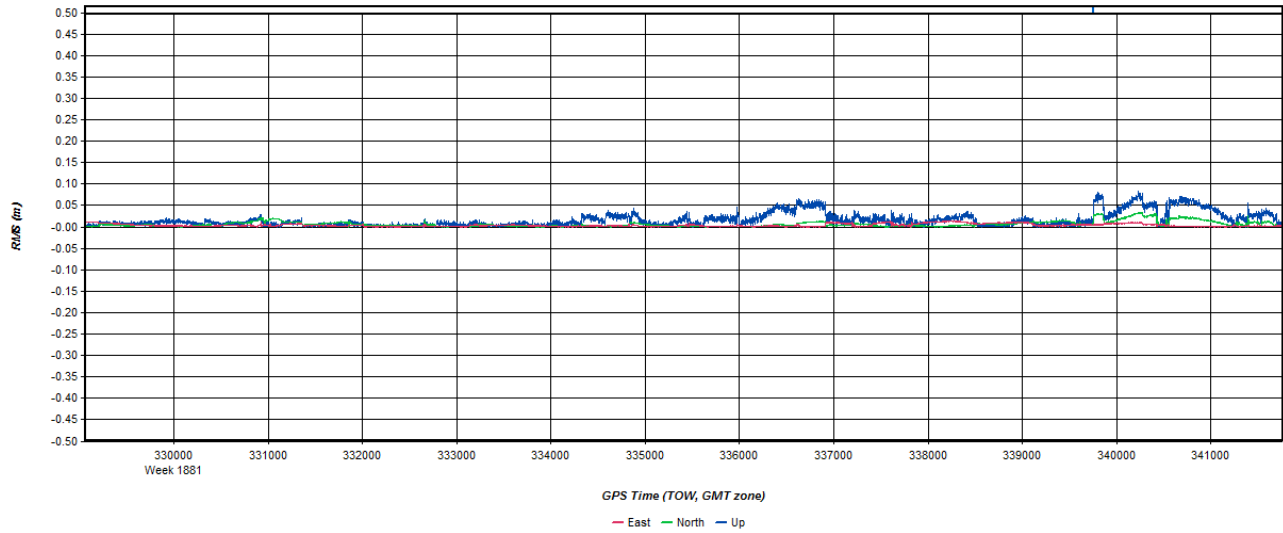


Distance from Base

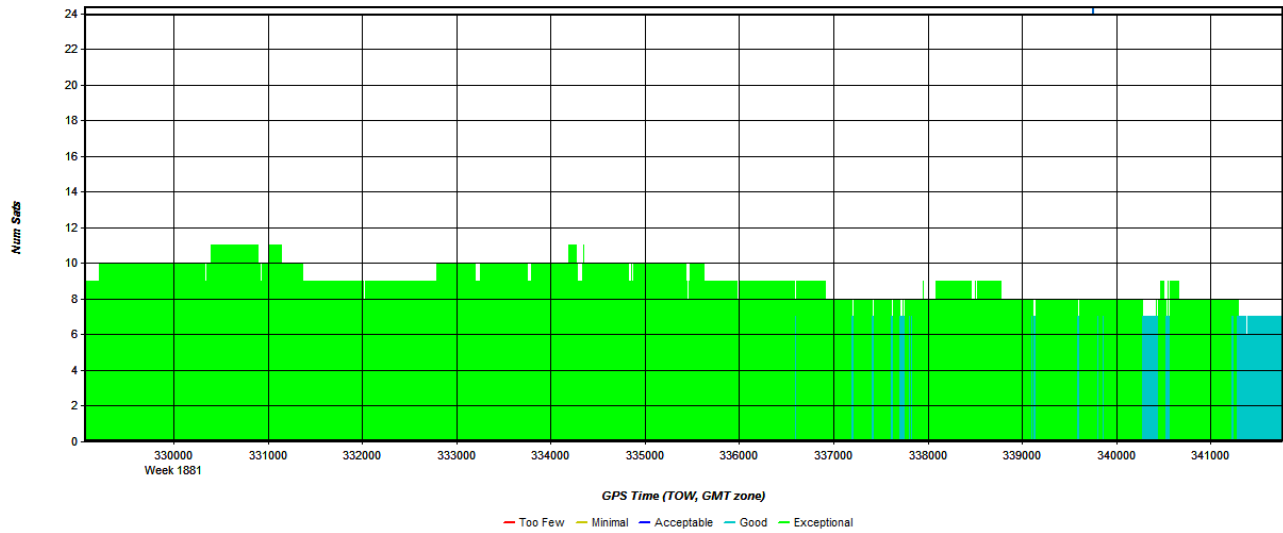




Combined RMS



SVs





Acquisition and Processing details ----- Collection 3 (February 1, 2016)

Log:



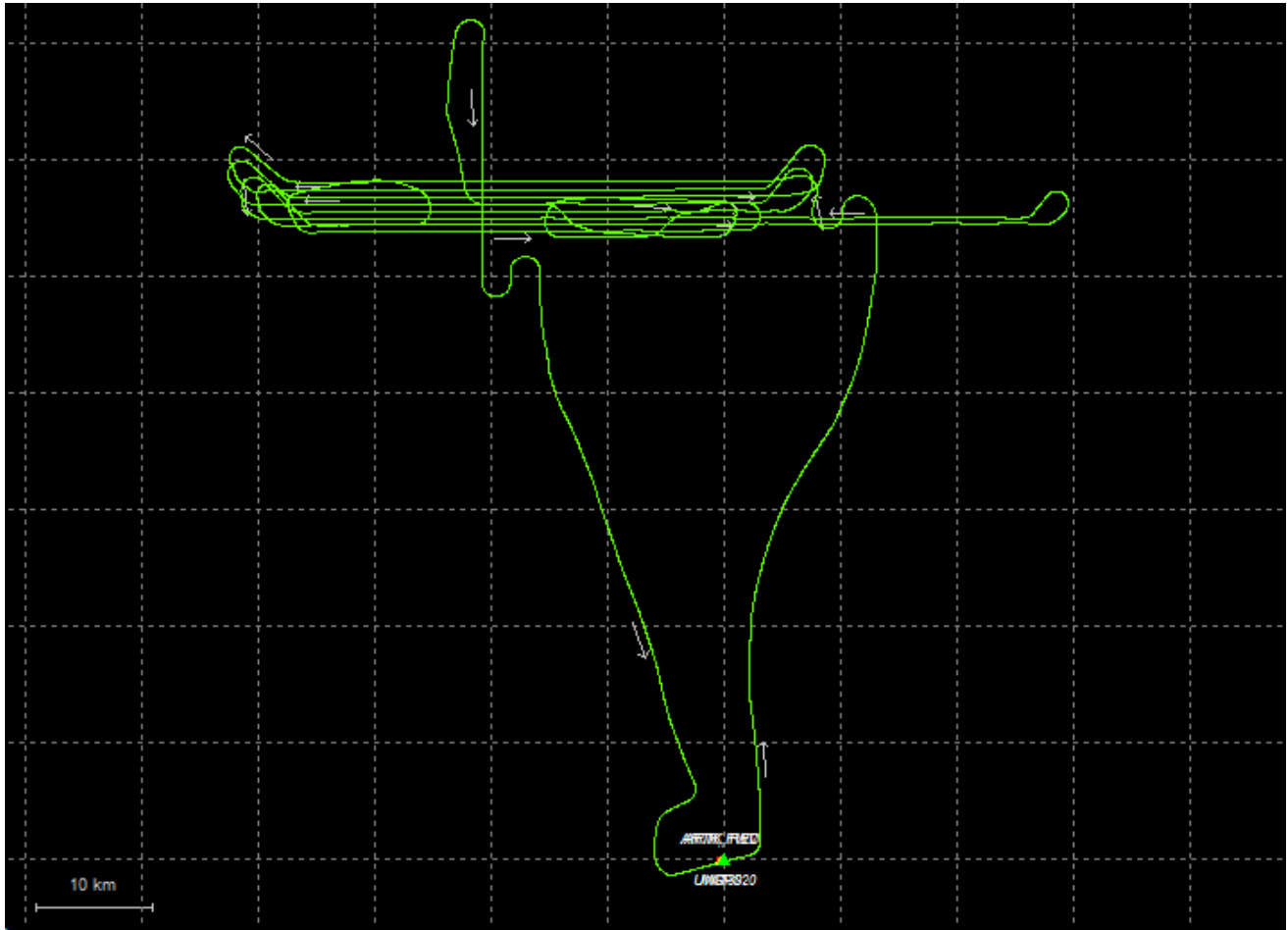
Fugro Geospatial, Inc.

15.2	Lift Begin			Lift End			Fit Duration	Fit Hrs	Hobbs Hrs	Activity
	Airport	Chocks	Hobbs	Airport	Chocks	Hobbs				
1	KRUE	15:40	9792.8	KRUE	18:48	9795.9	3:08	3.25	3.1	0900-Production
2	KRUE	-	9795.9	HR35	-	9796.6	#####	#####	0.7	0103-Mob/Demob
3										

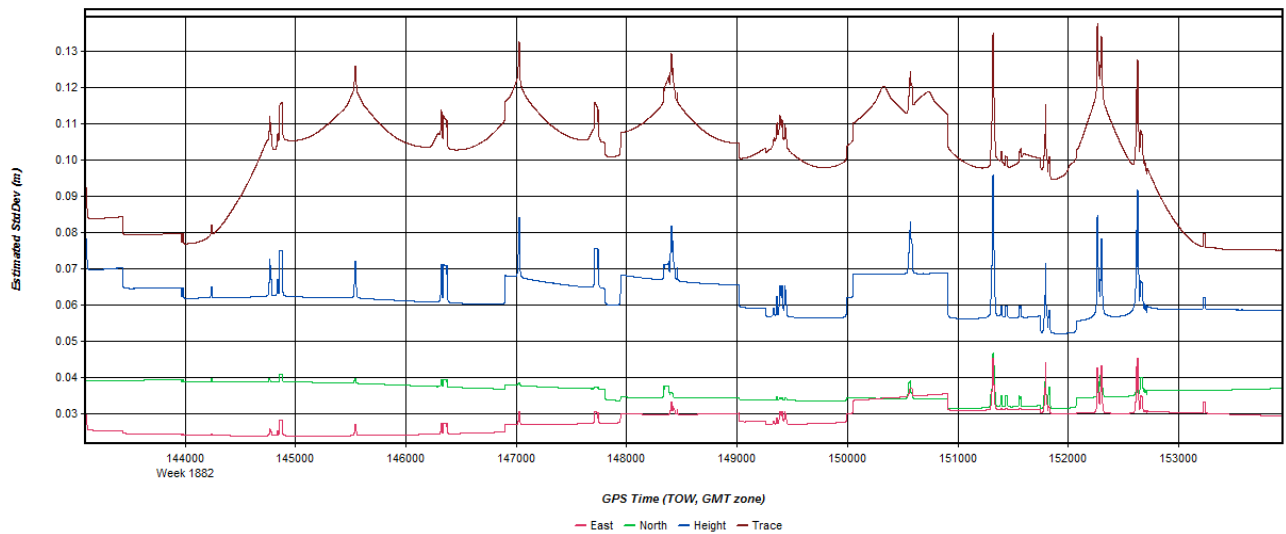
Q680i
Flight Log

FGI Job #	Project Name				Operator		Unit	IMU				Ground Temp °C	Min Range'	Data Logger Drives		
22.15005200	FEMA Dardanelle Reserv				Chris Acufia		165	-	-			9.0 12.0	2100	DR60-11		
Flight Date	GPS Day	Lift	System	Pilot		Sun*	Solar Times (UTC)		Pulse Rate			Flying Temp °C	Max Range'	Download Drive		
1-Feb-16	16-032	3	R680i	Corry Lane		-	-		240000			3.0 4.0	4052	EP1TB#44		
Mission ID (yyymmdd_Sen_Job_Lift)	Aircraft	Airport ID	FMS	UTC	AMT (ft)	Speed	FOV	Scan Rate (Hz)	MTA	km/WPT	AltM Setting	Humidity @ Alt	Shipping Track			
160201_165_15005200_03	N62912	KRUE	CCNS 7	-6	3400	140	-	240K	2	0.623	29.97 29.10	-	8770 6950 6339			
Base 1 ID	Location	Rec ID	Ant ID	ARP (m)	Start Time (UTC)		Stop Time (UTC)		GPS Filename			Operator	Data			
0202	KRUE	GR3Unit3	GR3Unit3	1.8	01-Feb-16 15:13		01-Jan-16 20:07		UNIT30201p			Chris Acufia	With AB			
Area	Flight #	Client	Wpt	Distance		UTC		Dir	Altitude (GPS)	Speed (knots)	Scan Rate	Comments and Conditions			SVs	PDOP
				From	To	Begin	End					Start	End			
680TF2	30		59	1	36.1	0	16:15:00	16:23:00	268	4,848	145					
	29		1	59	0	36.1	16:27:00	16:36:00	89	4,888	145					
	28		59	1	36.1	0	16:40:00	16:48:00	268	4,886	147					
	27		1	59	0	36.1	16:51:00	17:00:00	87	4,701	139					
	26		59	1	36.1	0	17:03:00	17:11:00	268	4,924	148					
	25		1	92	0	56.7	17:15:00	17:28:00	87	4,641	141					
	24		92	1	56.7	0	17:30:00	17:43:00	267	4,566	145					
	24		1	10	0	5.6	17:47:00	17:48:00	88	4,678	148					
	23		1	57	0	56.7	17:53:00	18:01:00	88	4,953	145					
	22			50	1		18:10:00	18:11:00								
	52		120	90	74.1	55.4	18:18:00	18:22:00	178	4,436	155					
							18:22:00	18:24:00								
							18:39:45	18:44:45								

Trajectory and GPS Plots:

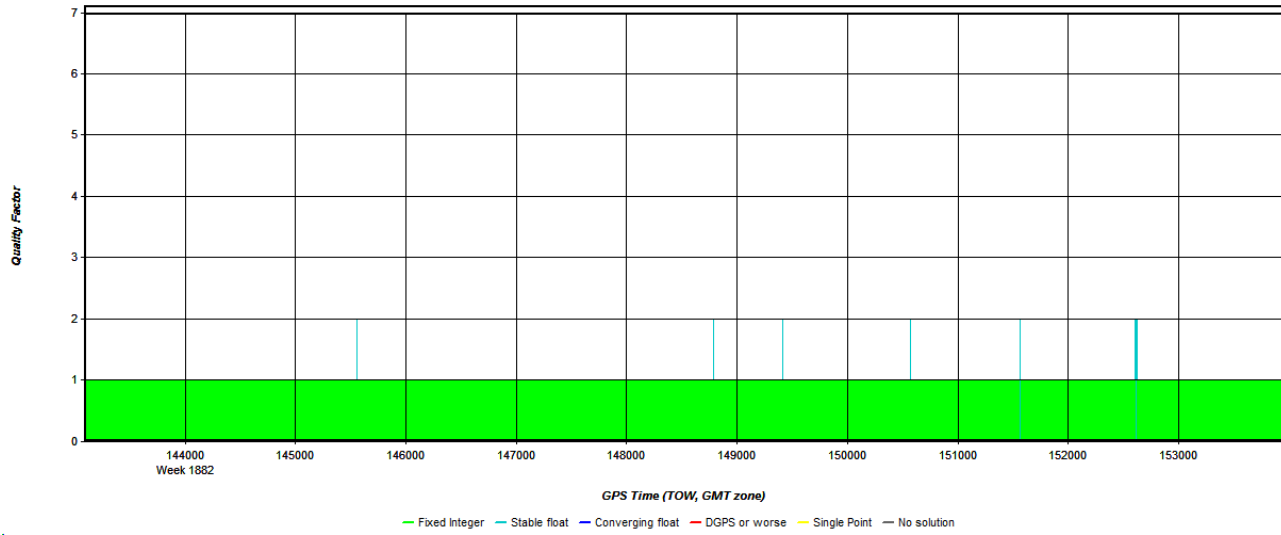


Estimated Accuracy

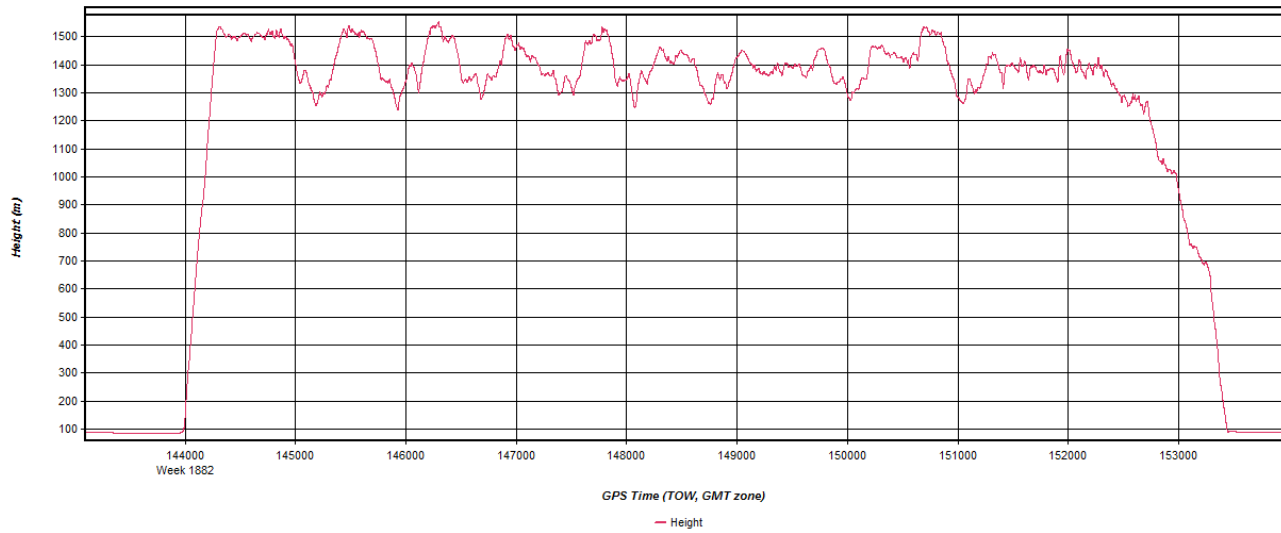




Quality Factor

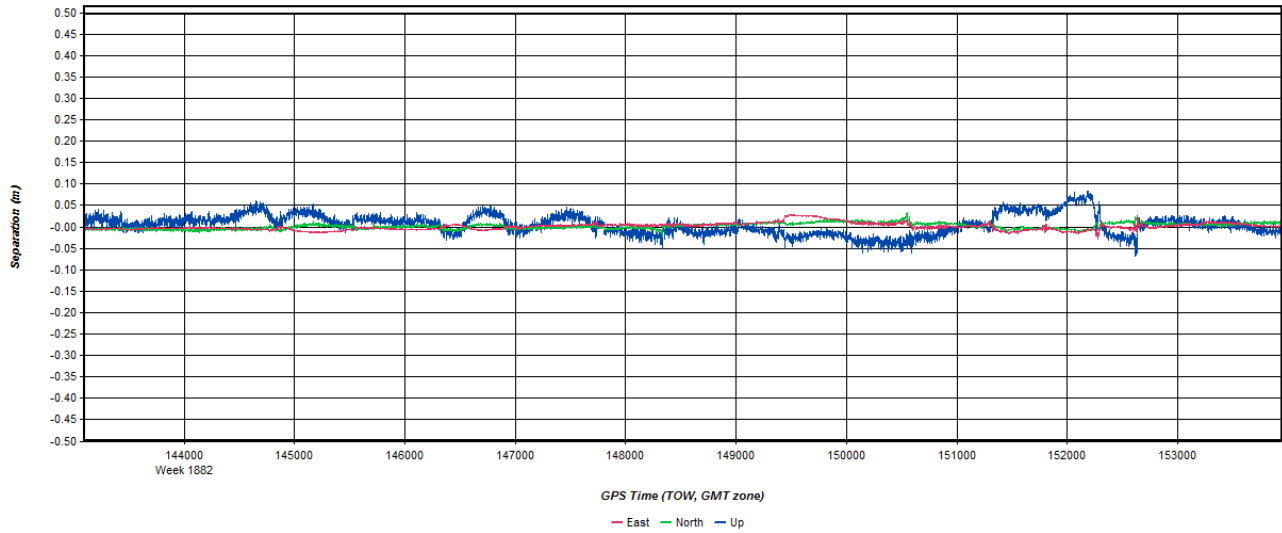


Height

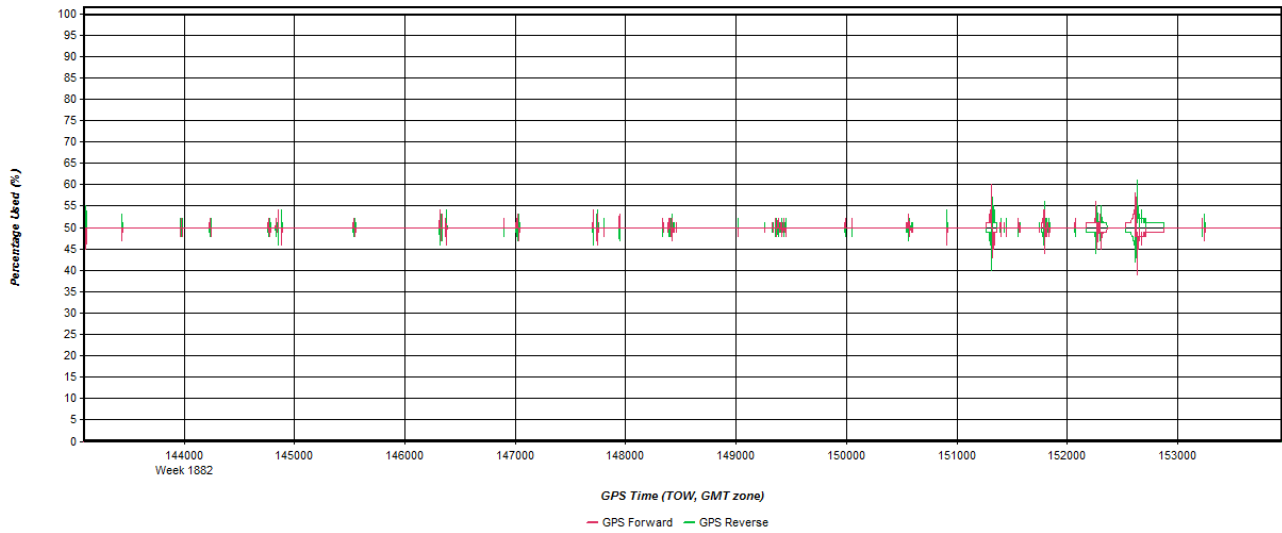




Combined Forward/Reverse Separation

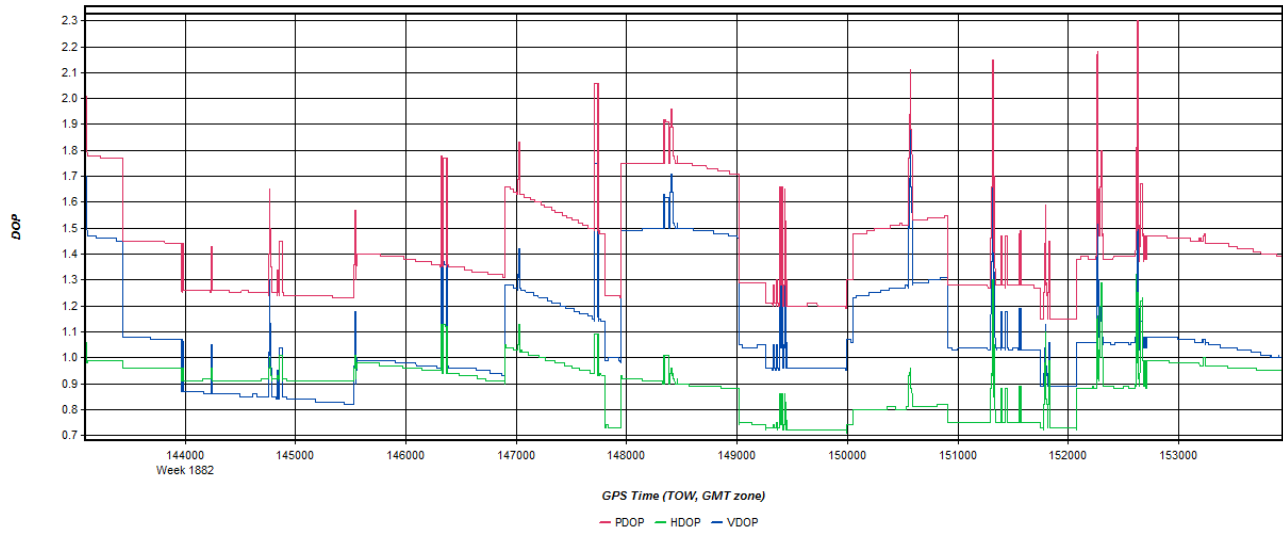


Combined Forward/Reverse Weighting

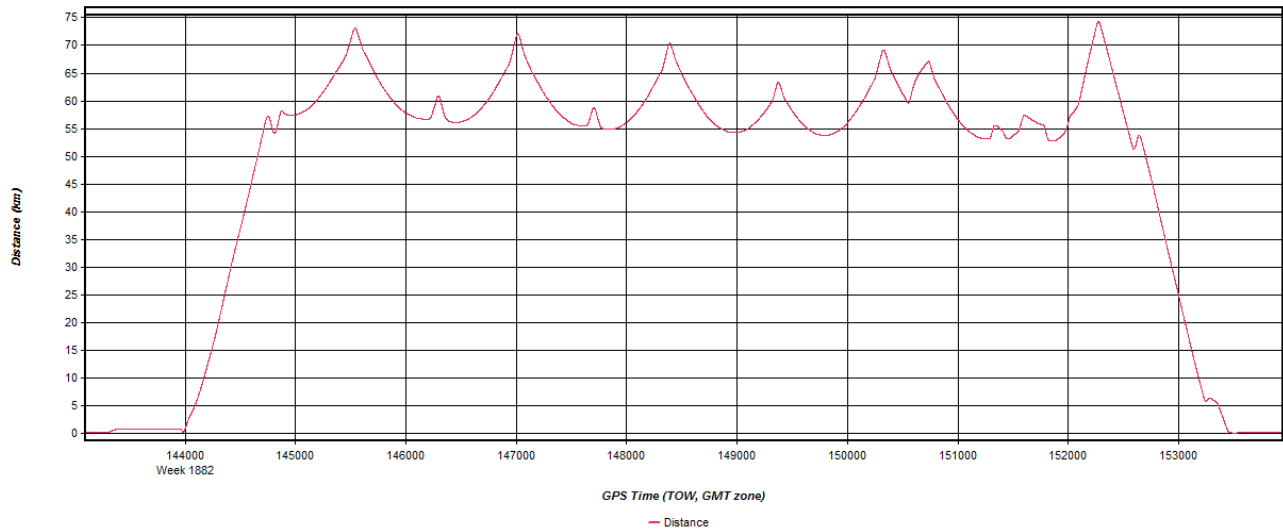




PDOP

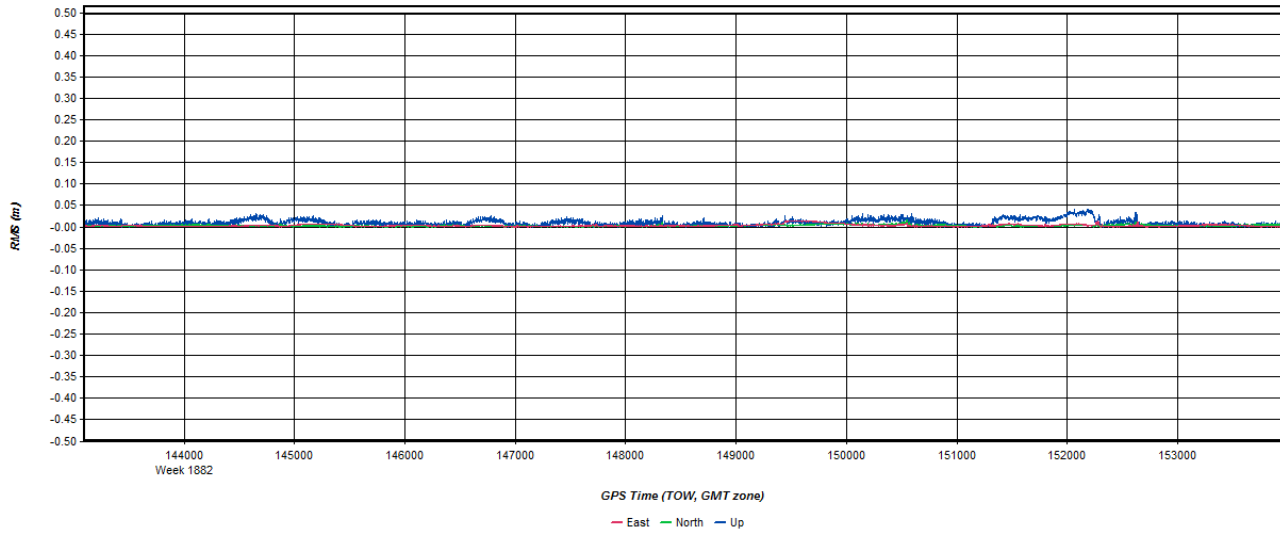


Distance from Base

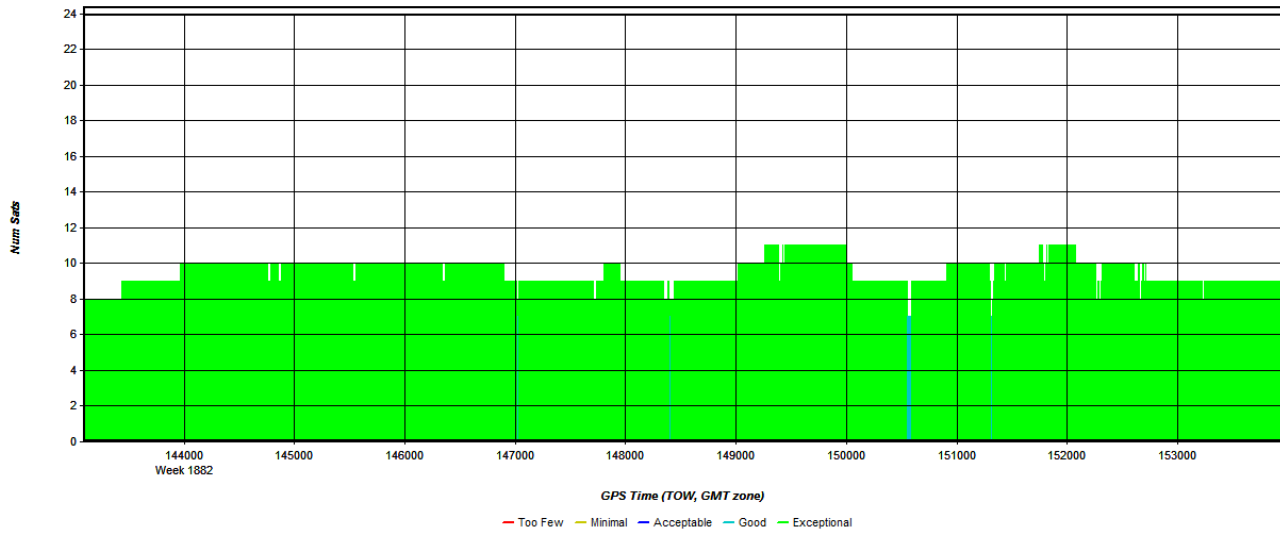




Combined RMS



SVs





Acquisition and Processing details ----- Collection 4 (February 2, 2016)

Log:



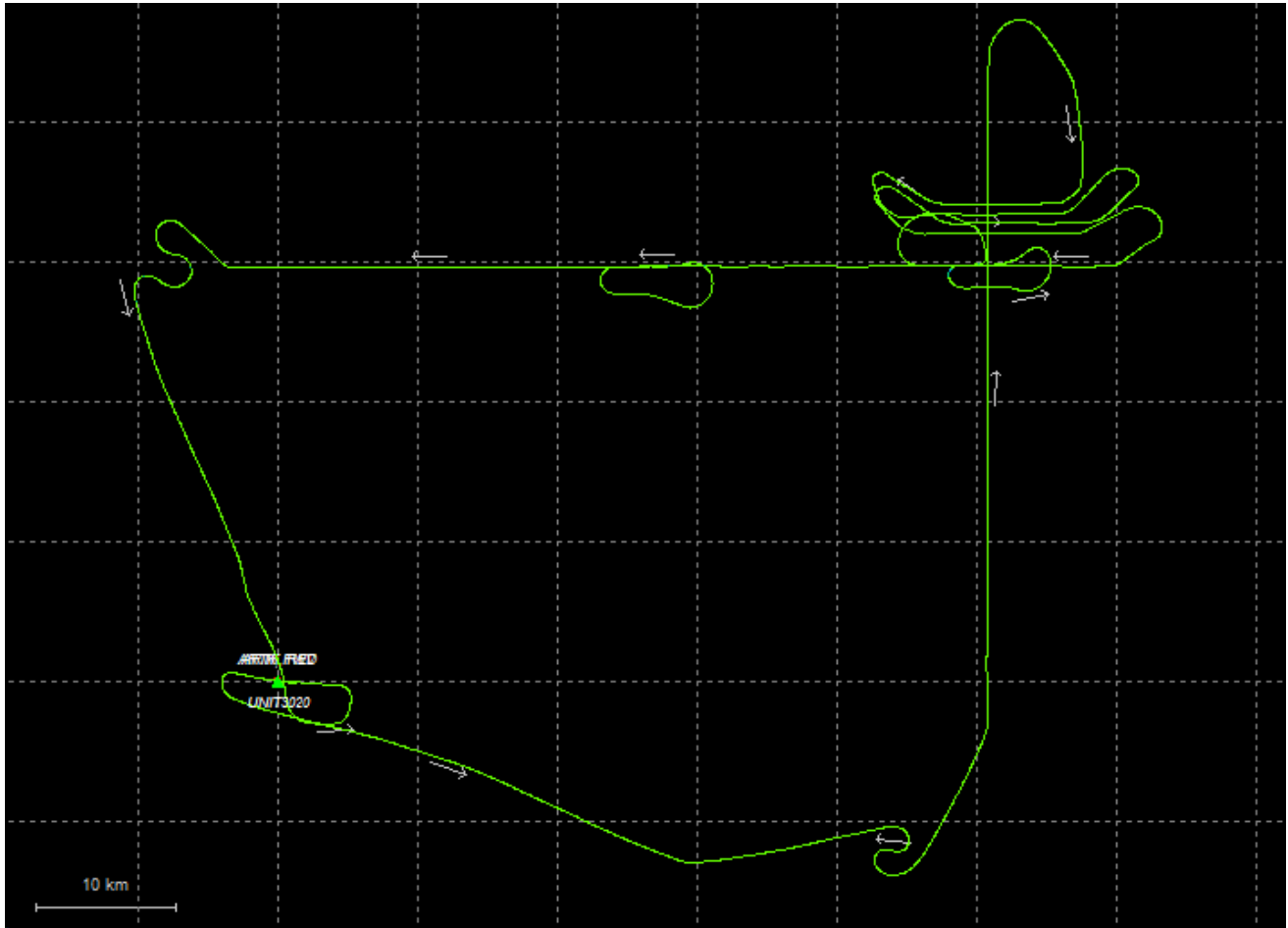
Fugro Geospatial, Inc.

15.2	Lift Begin			Lift End			Flt Duration	Flt Hrs	Hobbs Hrs	Activity
	Airport	Chocks	Hobbs	Airport	Chocks	Hobbs				
1	H35	17:40	9796.3	H35	19:41	9798.3	2:01	2.00	2.0	0900-Production
2										
3										

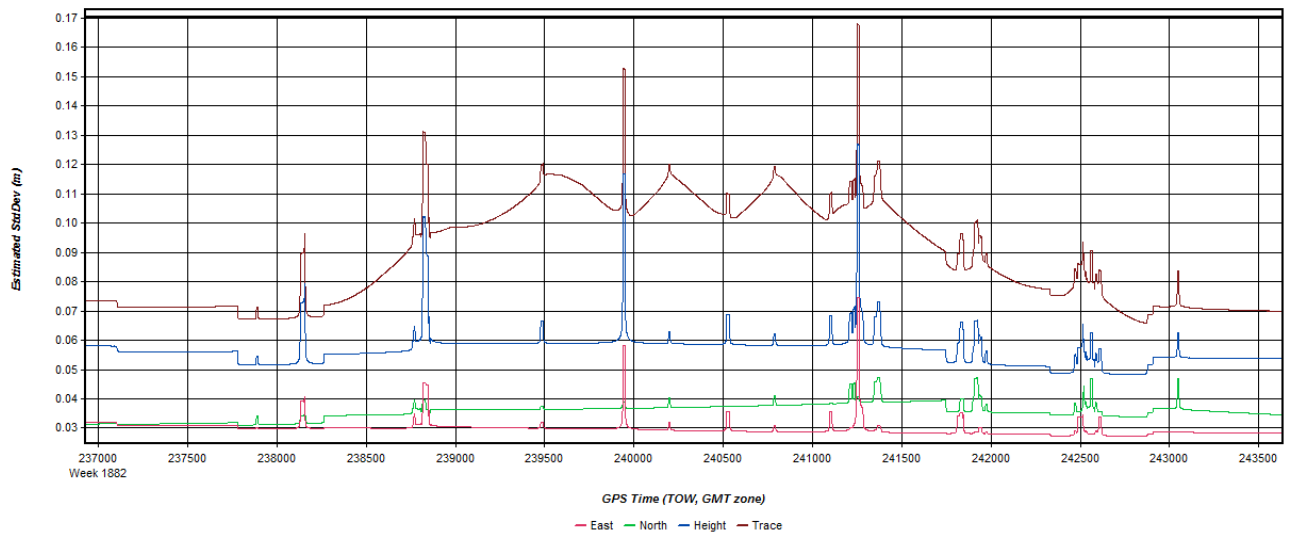
Q680i
Flight Log

FGI Job #	Project Name			Operator		Unit	IMU				Ground Temp °C	Min Range'	Data Logger Drives								
22.15005200	FEMA Dardanelle Reserv			Jacob Amundson		165	-	-			16.0 21.0	2100	DR680-3								
Flight Date	GPS Day	Lift	System	Pilot		Sun*	Solar Times (UTC)		Pulse Rate	Flying Temp °C		Max Range'	Download Drive								
2-Feb-16	16-033	4	R680I	Corry Lane		-	-		240000	9.0 9.0		4052	EP750#57								
Mission ID (yyymmdd_Sen_Job_Lift)	Aircraft	Airport ID	FMS	UTC	AMT (ft)	Speed	FOV	Scan Rate (Hz)	MTA	km/WPT	Altitude Setting	Humidity @ Alt	Shipping Track								
160202_165_15005200_04	N62912	H35	CCNS 7	-6	3400	140	-	240K	2	0.623	29.63 29.56	-	8770 6950 6340								
Base 1 ID	Location	Rec ID	Ant ID	ARP (m)	Start Time (UTC)		Stop Time (UTC)		GPS Filename		Operator		Data								
H35	H35	GR3Unit3	GR3Unit3	1.8	02-Feb-16 17:01		03-Feb-16 00:13		UNIT30202r		Jacob Amundson		With AB								
Area	Flight #	Client	Wpt	Distance		UTC		Dir	Altitude (GPS)	Speed (knots)	Scan Rate	Comments and Conditions		SVs	PDOP						
				From	To	Begin	End					Start	End								
680TF2	53		1	57									5 min gnd static at KH35	11	1.0						
													18:19:00								
													18:19:00								
													18:23:10	18:29:30	N	4,230	195		S-Turn in flight alignment	10	1.1
													18:35:40	18:37:20	E	4,560	132		CROSSING LINE	10	1.1
													18:40:20	18:41:50	W	4,764	150		FAST DUE TO WIND SPEED	9	1.2
													18:45:20	18:47:00	E	4,750	135			9	1.2
													18:49:50	18:51:45	W	4,885	150			9	1.2
													18:55:00		E	4,525	145		OFF LINE WILL REDO	9	1.2
													19:03:50	19:19:45	E	4,920	150			10	1.1
													19:20:15						S TURN	11	1.0
													19:34:30	19:39:30					GROUND STATIC	11	1.0

Trajectory and GPS Plots:

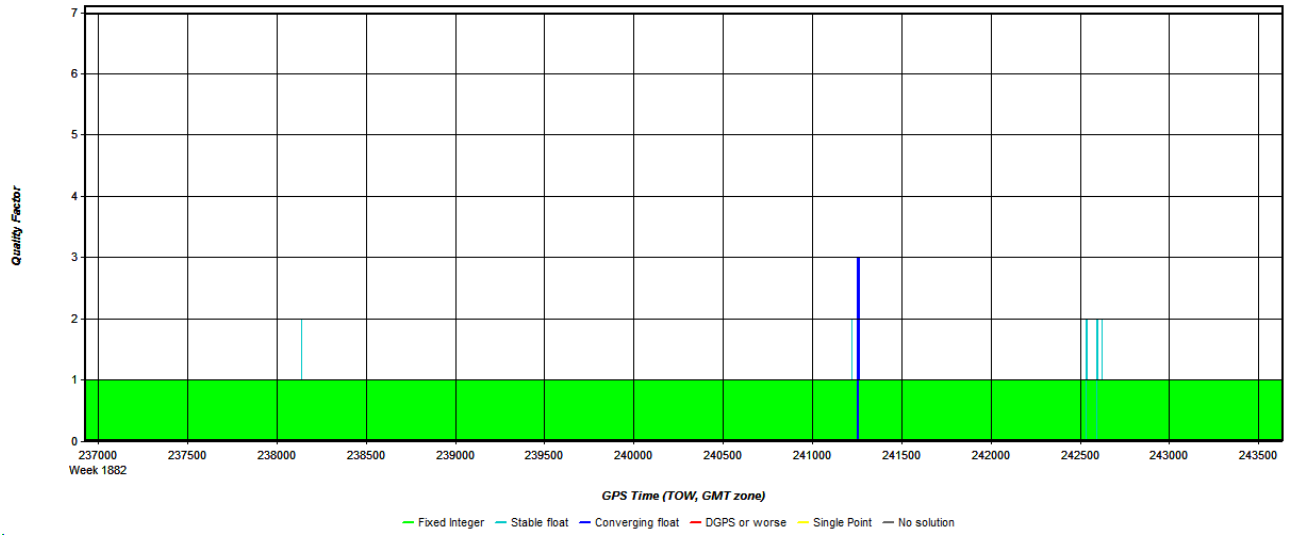


Estimated Accuracy

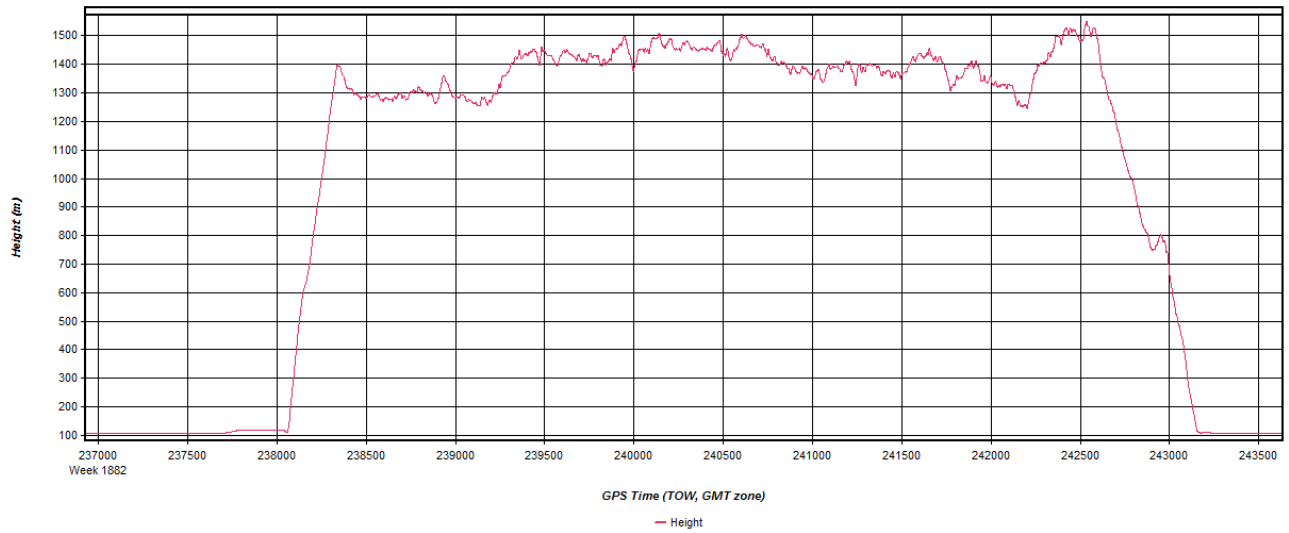




Quality Factor

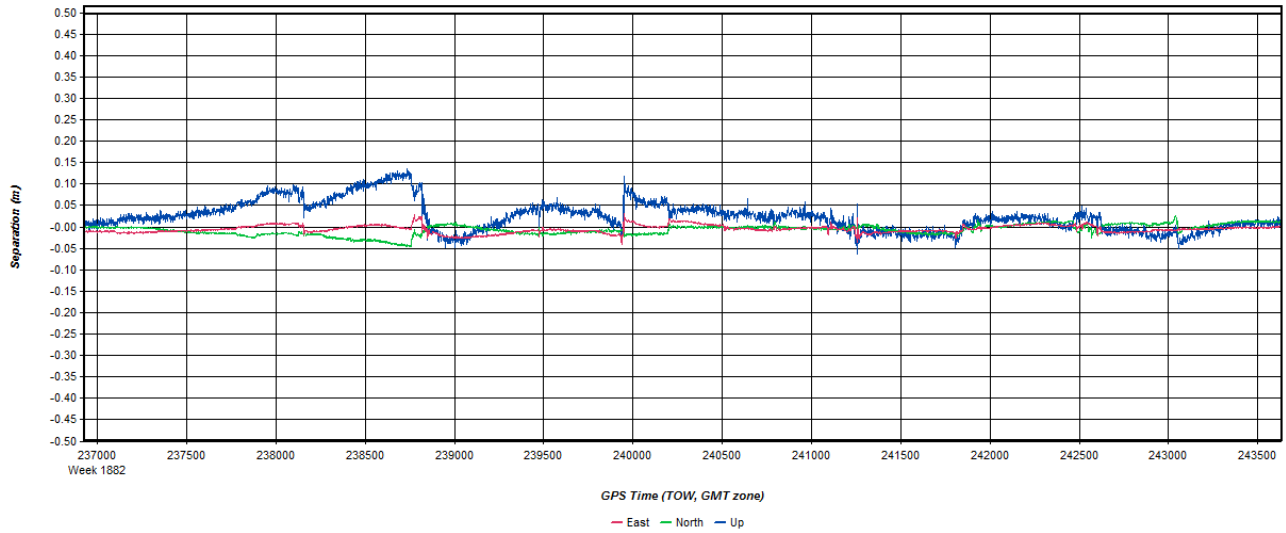


Height





Combined Forward/Reverse Separation

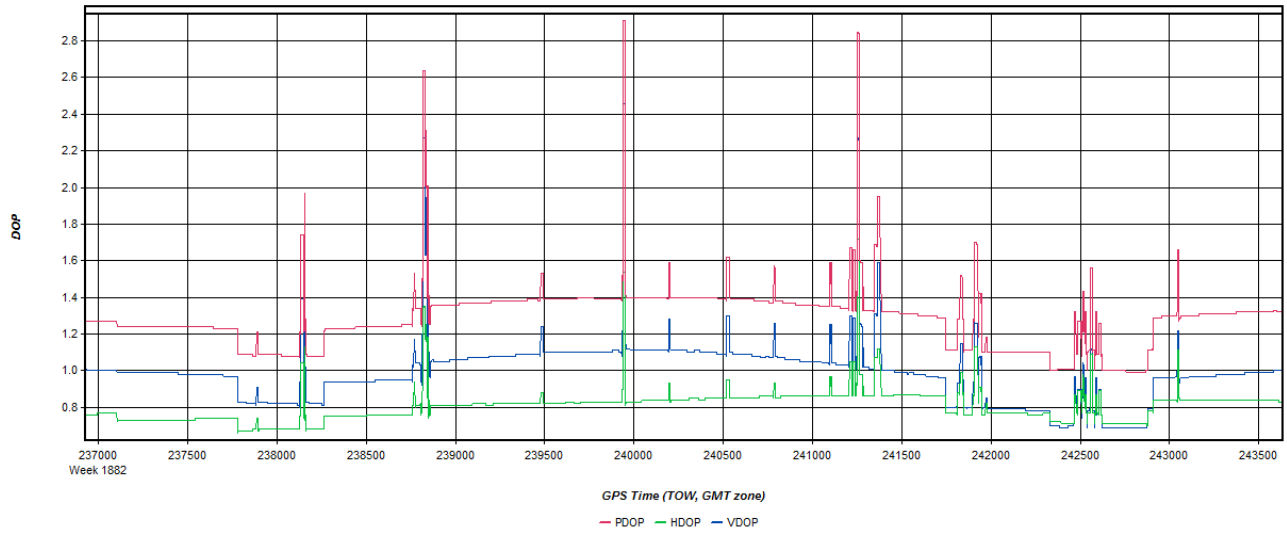


Combined Forward/Reverse Weighting

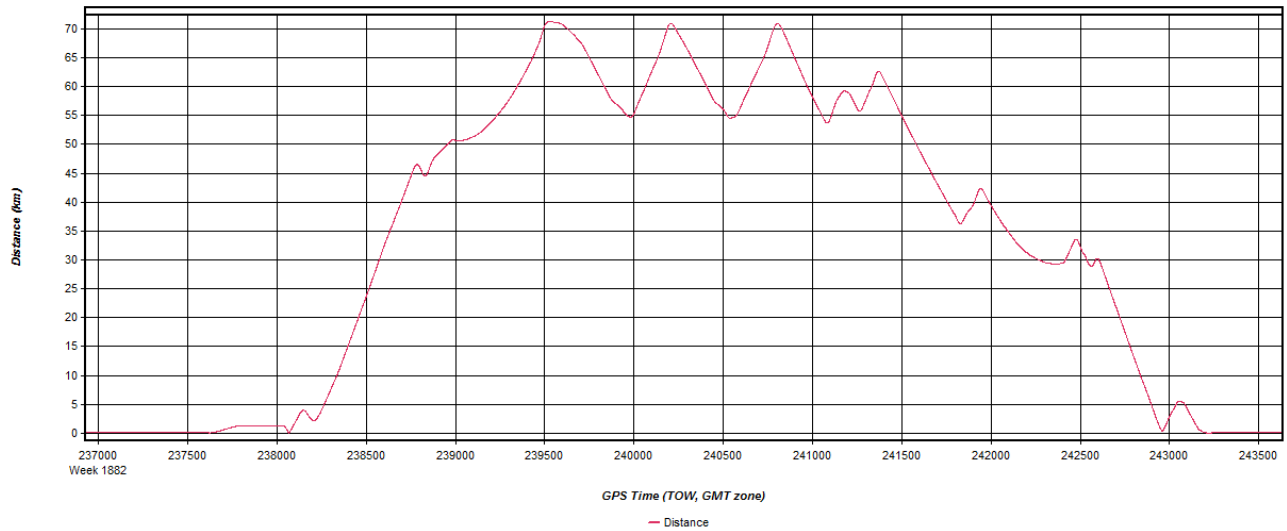




PDOP

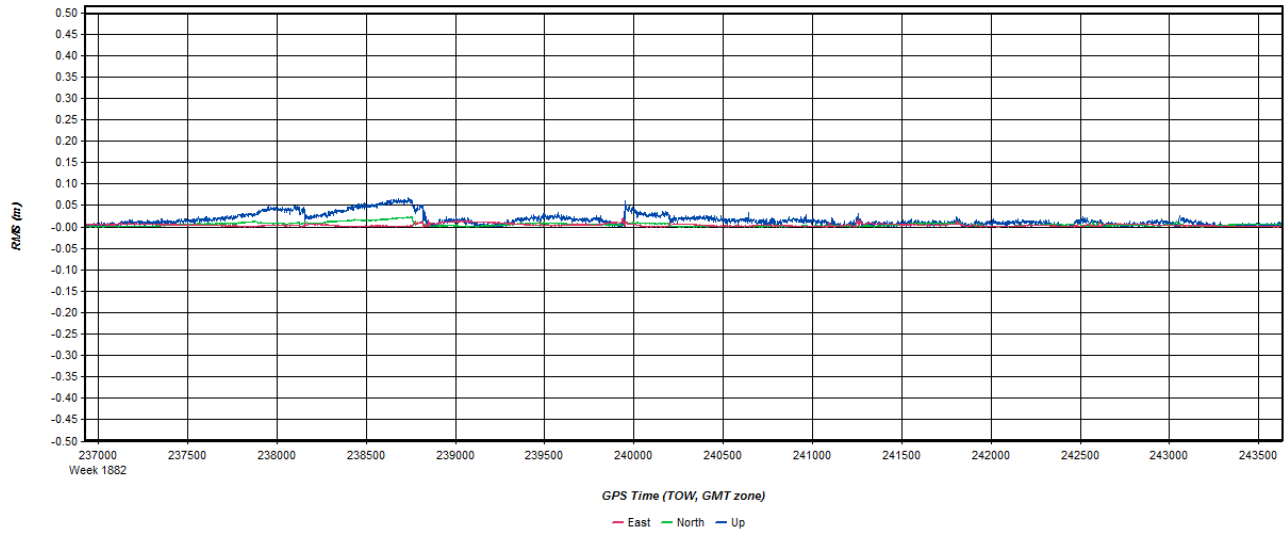


Distance from Base

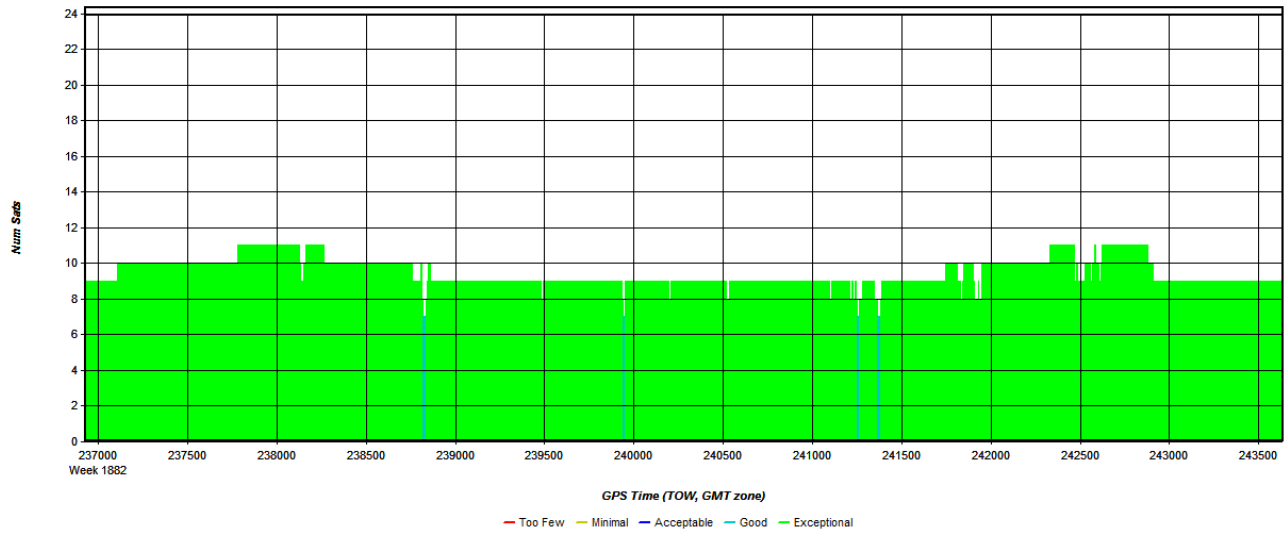




Combined RMS



SVs





Acquisition and Processing details ----- Collection 5 (February 2, 2016)

Log:



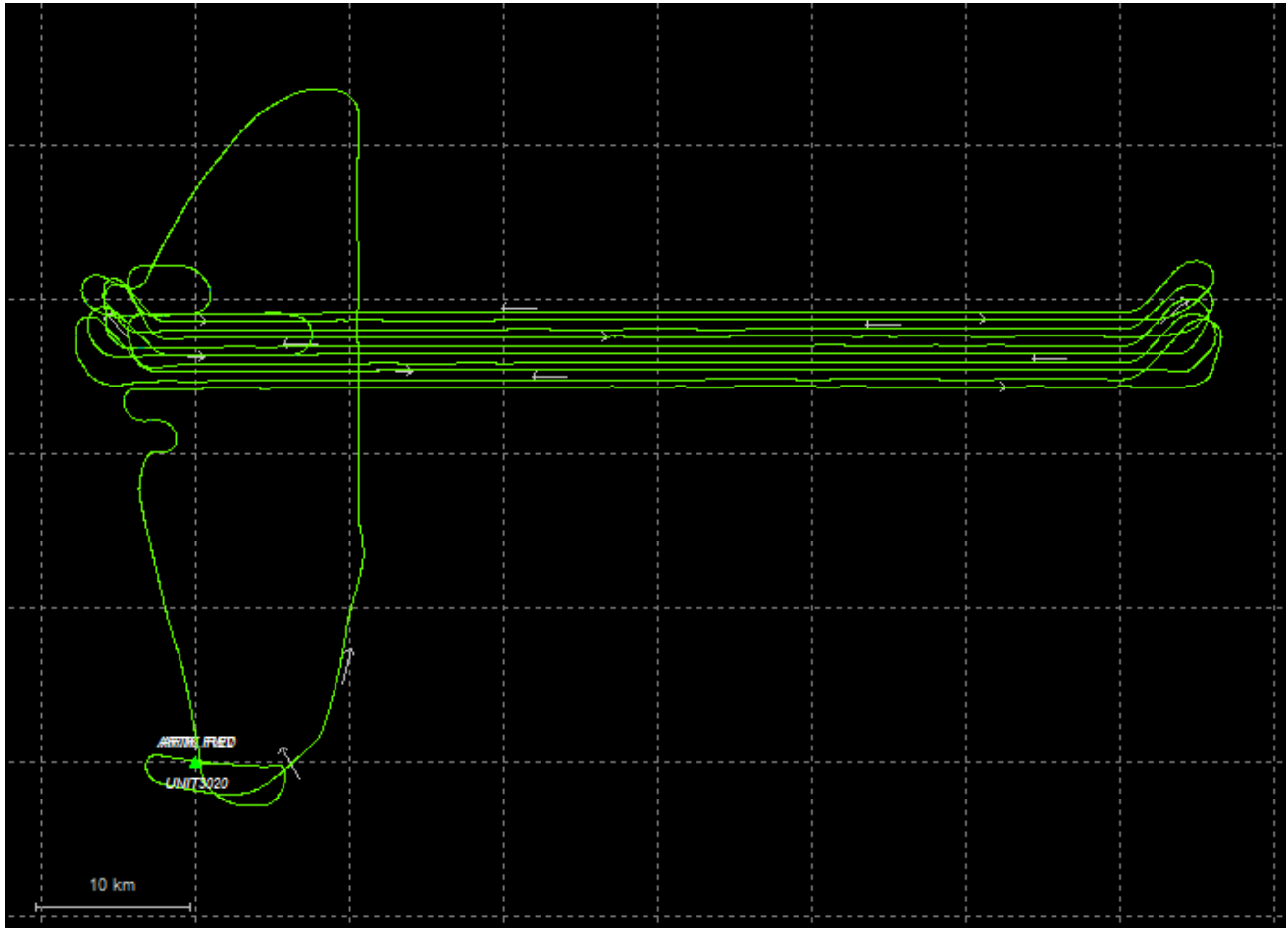
Fugro Geospatial, Inc.

15.2	Lift Begin			Lift End			Fit Duration	Fit Hrs	Hobbs Hrs	Activity
	Airport	Chocks	Hobbs	Airport	Chocks	Hobbs				
1	H35	20:33	9798.3	H35	0:10	9802.1	3:37	3.50	3.8	0900-Production
2										
3										

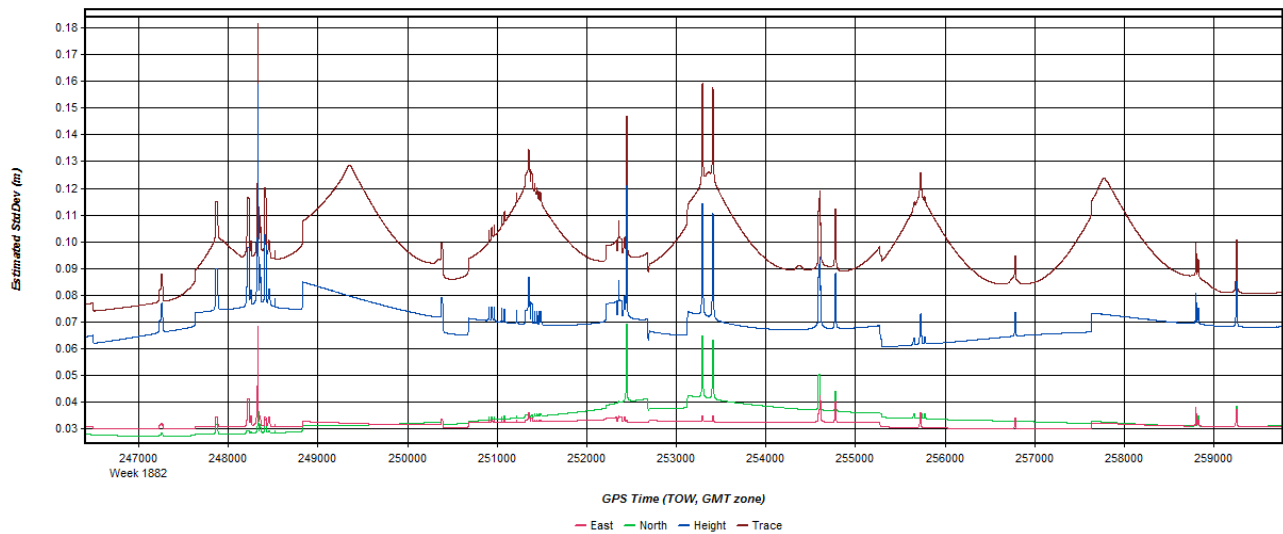
Q680i
Flight Log

FGI Job #	Project Name				Operator		Unit	IMU				Ground Temp °C	Min Range'	Data Logger Drives	
22.15005200	FEMA Dardanelle Reserv				Chris Acuña		165	-	-			18.0	12.0	2100	DR680-8 & 7
Flight Date	GPS Day	Lift	System	Pilot		Sun*	Solar Times (UTC)		Pulse Rate			Flying Temp °C	Max Range'	Download Drive	
2-Feb-16	16-033	5	R680i	Corry Lane		-	-		240000			4.0	2.0	4052	EP750#57
Mission ID (yyymmdd_Sen_Job_Lift)	Aircraft	Airport ID	FMS	UTC	AMT (ft)	Speed	FOV	Scan Rate (Hz)	MTA	km/WPT	Alt Setting	Humidity @ Alt	Shipping Track		
160202_165_15005200_05	N62912	H35	CCNS 7	-6	3400	140	-	240K	2	0.623	29.50	29.50	-	8770 6950 6340	
Base 1 ID	Location	Rec ID	Ant ID	ARP (m)	Start Time (UTC)		Stop Time (UTC)		GPS Filename			Operator	Data		
H35	H35	GR3Unit3	GR3Unit3	1.8	02-Feb-16 17:01		03-Feb-16 00:13		UNIT30202r			Jacob Amundson	With AB		
Area	Flight #	Client	Wpt	Distance		UTC		Fit Dir	Altitude (GPS)	Speed (knots)	Scan Rate	Comments and Conditions		SVs	PDOP
				From	To	Begin	End					Start	End		
													5 min gnd static alignment at KH35	10	1.1
													S-Turn in flight alignment		
680TF2	52		77	99	47.3	61.1	20:46:00	20:49:00	356	4,110	181		Crossing Line	10	1.1
	21		1	97									Missed start		
	21		1	97	0	59.8	21:01:00	21:14:00	88	4,847	139		Rtns 99 to 100%; Mod turb	9	1.2
	20		96	1	59.2	0	21:17:00	21:31:00	268	4,550	143		Rtns 99 to 100%; Mod turb	9	1.0
	19		1	96	0	59.2	21:34:00	21:47:00	89	4,708	148		Rtns 99 to 100%; Mod turb	9	1.1
	18		96	1	59.2	0	21:50:00	22:04:00	269	4,520	138		Rtns 97 to 100%; Mod turb	8	1.1
	17		1	96	0	59.2	22:07:00	22:21:00	88	4,480	154		Rtns 99 to 100%; Mod turb	8	1.1
	16		96	1	59.2	0	22:24:00	22:38:00	269	4,388	142		Rtns 99 to 100%; Mod turb	8	1.2
	16		1	10	0	5.6	22:41:00	22:42:00	88	4,555	143		Calibration Line	7	1.3
	15		1	96	0	59.2	22:47:00	23:00:00	87	4,350	149		Rtns 99 to 100%; Lt turb	7	1.3
	14		97	1	59.8	0	23:03:00	23:17:00	267	4,246	138		Rtns 99 to 100%; Lt turb	9	1.1
	13		1	98	0	60.4	23:21:00	23:34:00	90	4,488	150		Rtns 99 to 100%; Lt turb	9	1.1
	12		99	1	61.1	0	23:38:00	23:52:00	269	4,614	137		Rtns 99 to 100%; Lt turb	9	1.2
							23:52:00	23:54:00					S-Turn post in flight alignment	8	1.4
							0:03:32	0:08:32					5 min post gnd static alignment at H35		

Trajectory and GPS Plots:

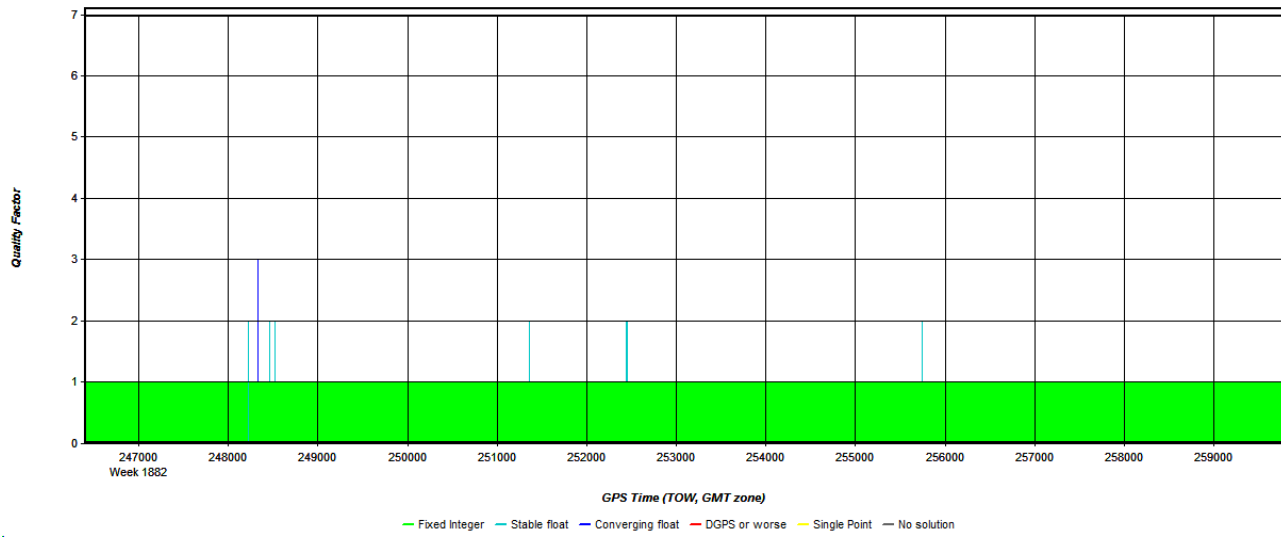


Estimated Accuracy

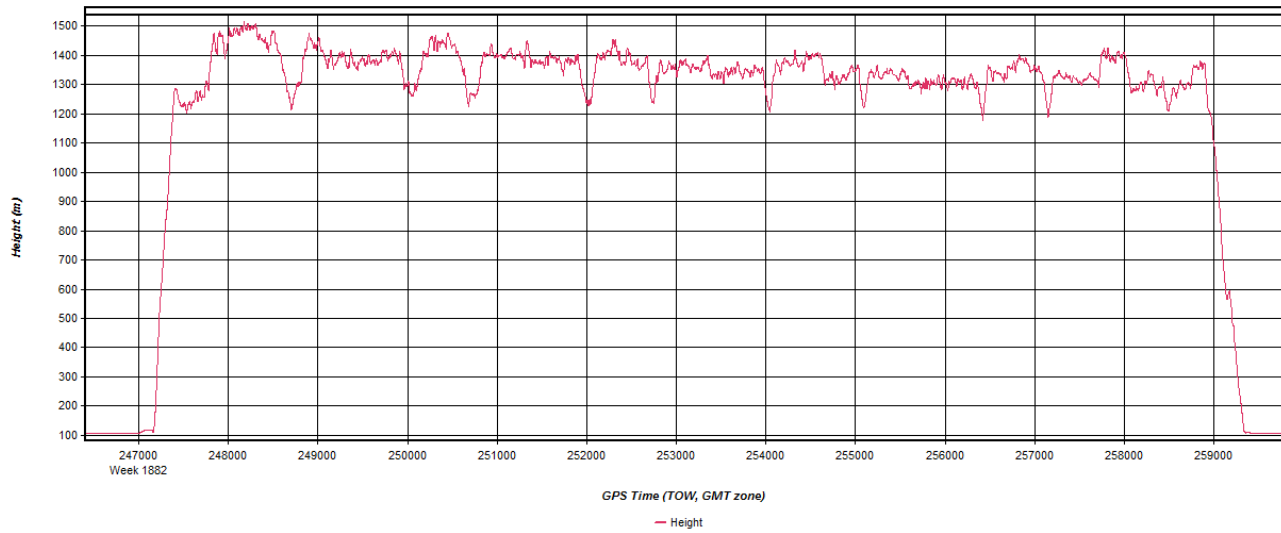




Quality Factor

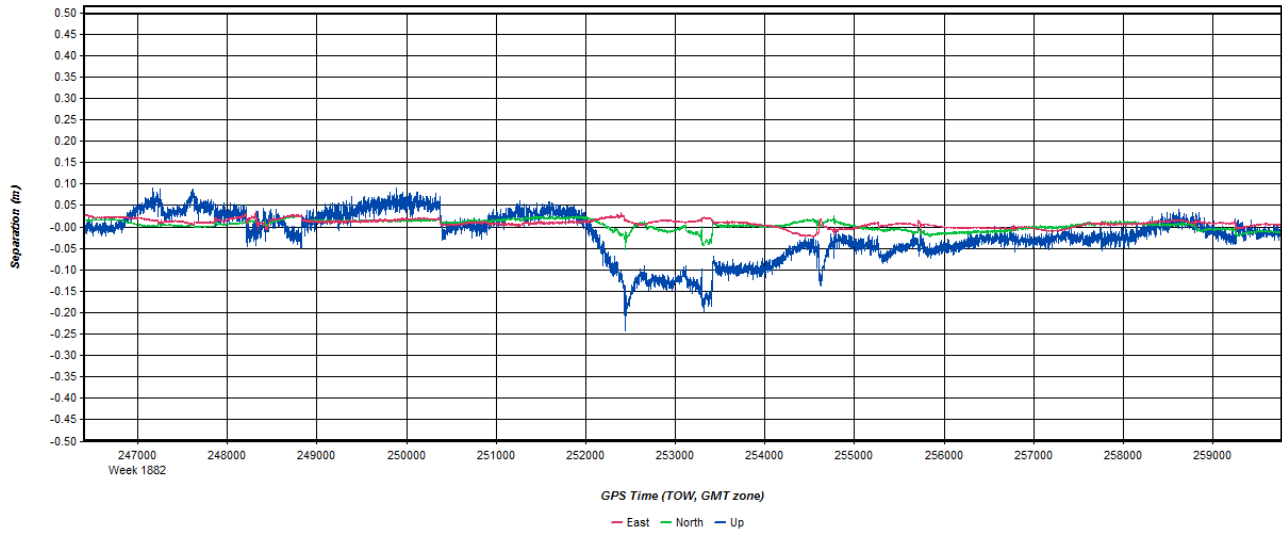


Height

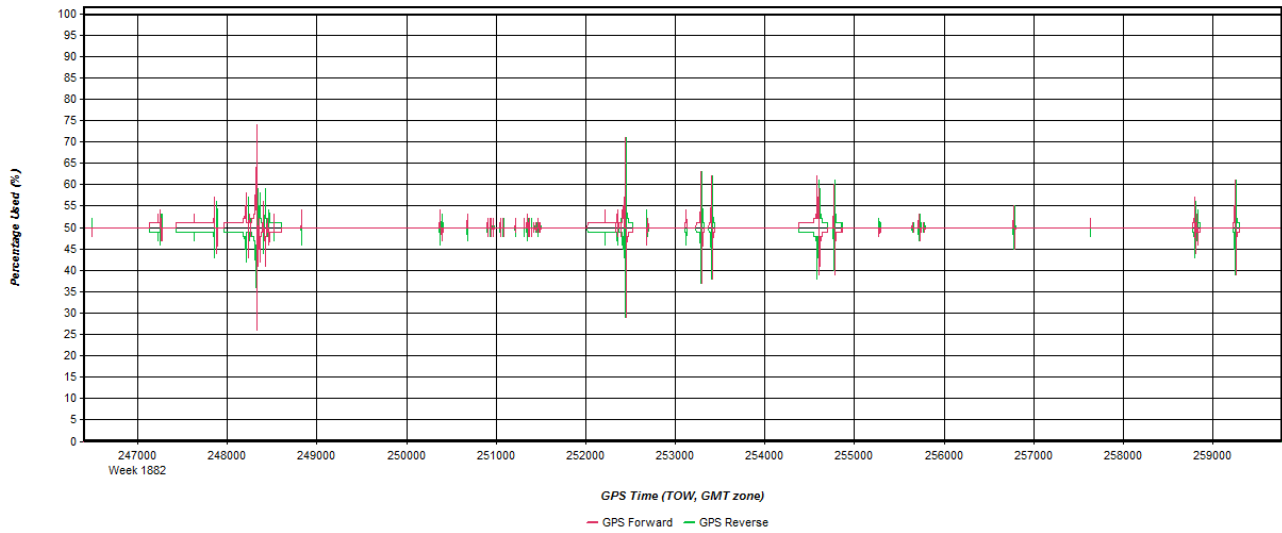




Combined Forward/Reverse Separation

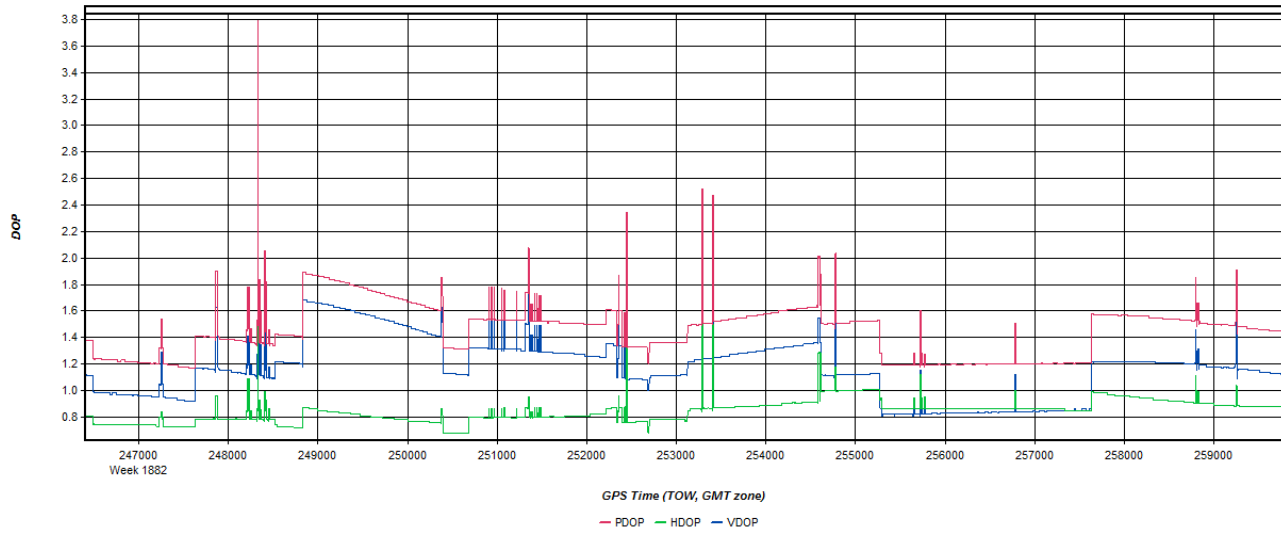


Combined Forward/Reverse Weighting

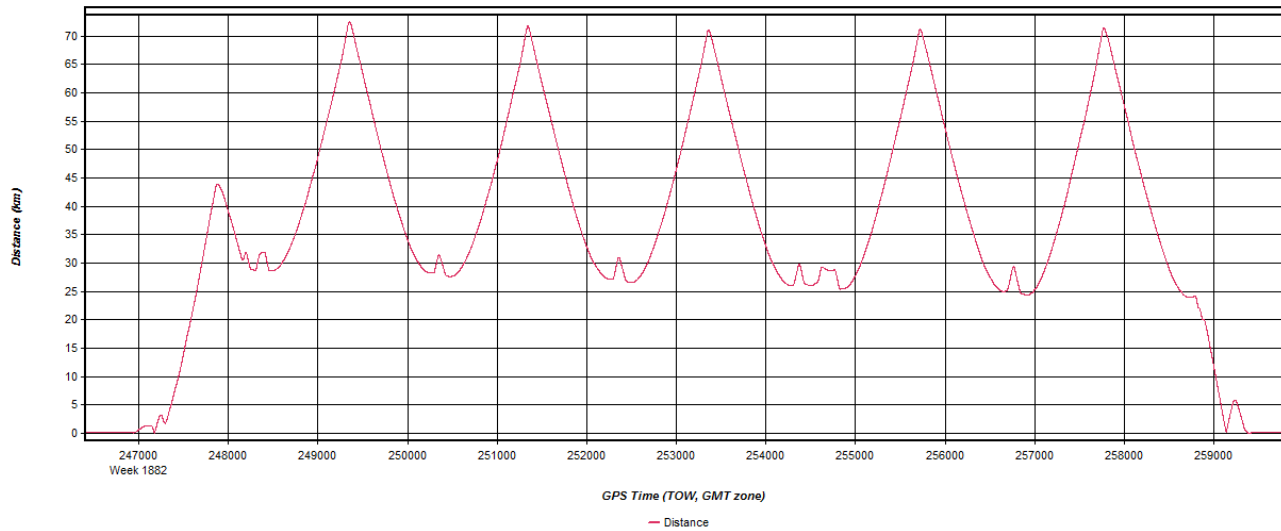




PDOP

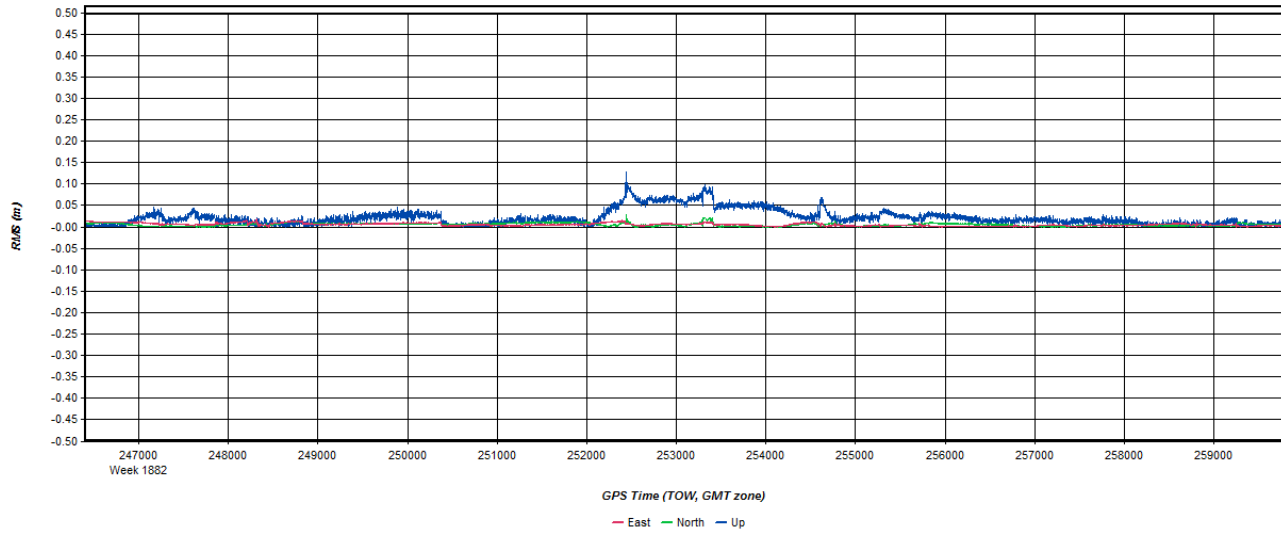


Distance from Base

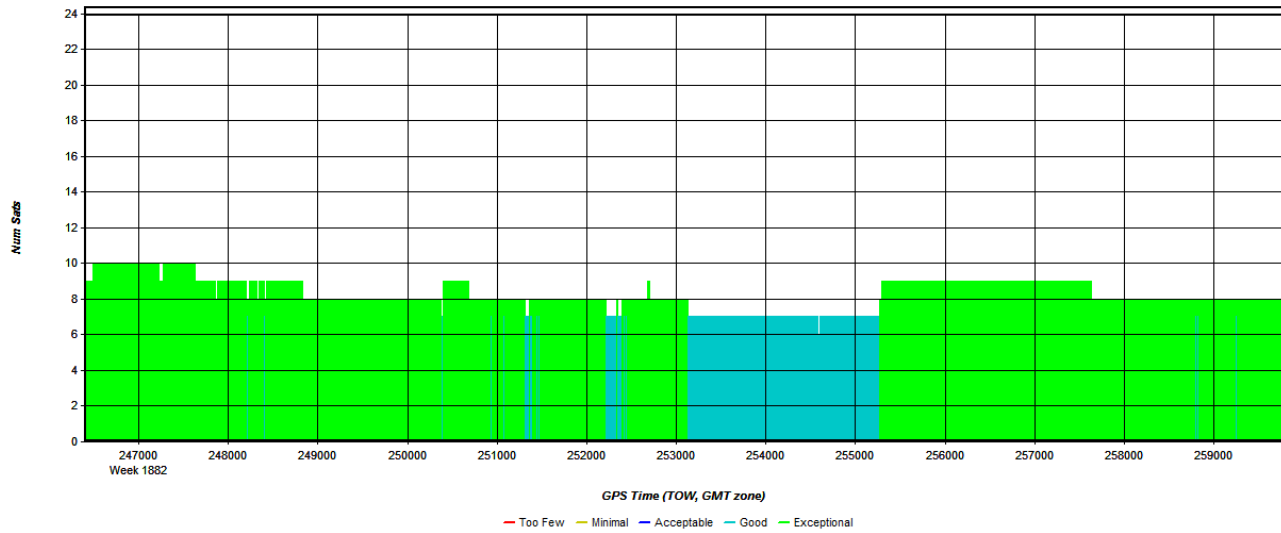




Combined RMS



SVs





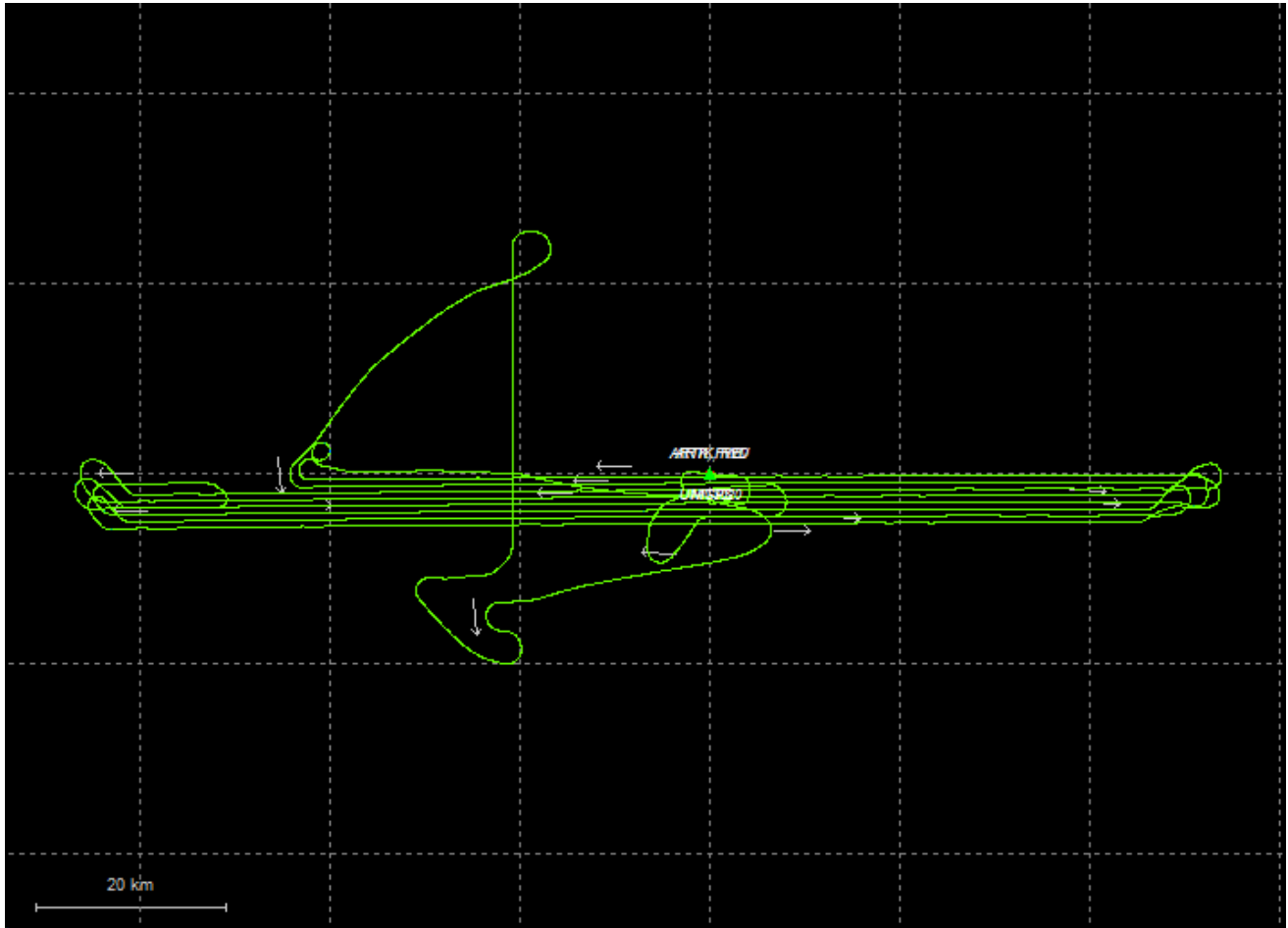
Acquisition and Processing details ----- Collection 6 (February 3, 2016)

Log:

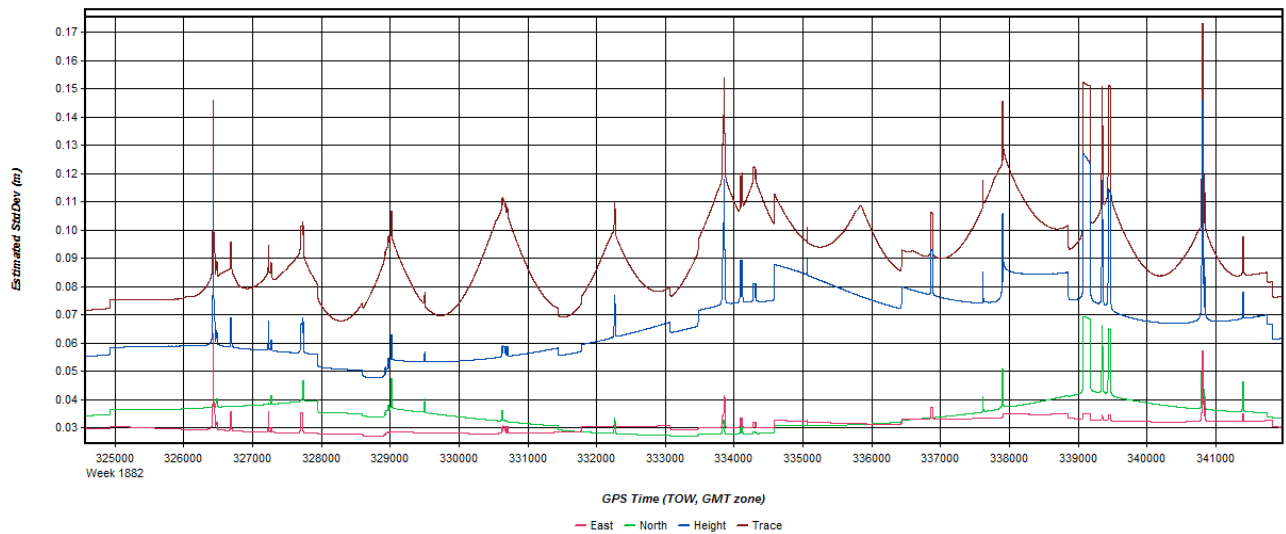
FUGRO		Fugro Geospatial, Inc.										Q680i Flight Log	
15.2		Lift Begin			Lift End			Flt	Flt	Hobbs	Activity		
		Airport	Chocks	Hobbs	Airport	Chocks	Hobbs	Duration	Hrs	Hrs			
1		H35	18:05	9802.1	H35	23:00	9807.1	4:55	5.00	5.0	0900-Production		
2													
3													

FGL Job #		Project Name			Operator		Unit	IMU			Ground Temp °C	Mn Range'	Data Logger Drives		
22.15005200		FEMA Dardanelle Reserv			Jacob Amundson		165	-	-		4.0 4.0	2100	DR680-11		
Flight Date		GPS Day	Lift	System	Pilot		Sun*	Solar Times (UTC)		Pulse Rate	Flying Temp °C	Max Range'	Download Drive		
3-Feb-16		16-034	6	R680I	Corry Lane		-	-		240000	-4.0 -4.0	4052	EP1TB#52		
Mission ID (yyymmdd_Sen_Job_Lift)		Aircraft	Airport ID	FMS	UTC	AMT (ft)	Speed	FOV	Scan Rate (Hz)	MTA	km/WPT	Altitude Setting	Humidity @ Alt	Shipping Track	
160203_165_15005200_06		N62912	H35	CCNS 7	-6	3400	140	-	240K	2	0.623	30.10 30.13	-	8770 6950 6350	
Base 1 ID	Location		Rec ID	Ant ID	ARP (m)	Start Time (UTC)		Stop Time (UTC)		GPS Filename		Operator	Data		
H35	H35		GR3Unit3	GR3Unit3	1.8	03-Feb-16 23:07		03-Feb-16 23:07		UNIT30203q.tps		Jacob Amundson	With AB		
Area	Flight #	Client	Wpt	Distance		UTC		Dir	Altitude	Speed	Scan	Comments and Conditions		SVs	PDOF
				From	To	Begin	End		(GPS)	(knots)	Rate				
						18:15:15	18:20:15					GROUND STATIC		10	1.1
						18:39:55						S TURN		9	1.2
680TF2	51		55	80	33.6	49.2	18:46:00	18:50:50	N	3,600	150	CROSSING LINE		9	1.2
680TF1	64		1	143	0	88.5	19:01:00	19:20:30	E	3,600	145			10	1.0
	63		171	1	106	0	19:24:25	19:48:25	W	3,535	140			11	1.0
	62		1	169	0	105	19:51:00	20:15:20	E	3,680	145			9	1.1
	61		168	1	104	0	20:18:30	20:42:10	W	3,595	140			10	1.2
	61		1	10	0	5.6	20:45:30	20:47:10	E	3,750	145	CALIBRATION LINE		9	1.2
	60		1	167	0	103	20:52:25	21:15:30	E	3,790	145			9	1.2
	59		166	93	103	57.3	21:18:15	21:28:20	W	3,600	145	BROKE OFF DUE TO ATC TRAFFIC		9	1.2
	59		100	1	61.7	0	21:35:10	21:49:05	W	3,560	150			9	1.1
	58		1	165	0	102	21:51:00	22:15:15	E	3,700	145			8	1.3
	65		144	1	89.1	0	22:18:25	22:35:35	W	3,650	145			9	1.1
							22:35:40					S TURN		7	1.4
							22:53:30	22:58:30				GROUND STATIC		9	1.1

Trajectory and GPS Plots:

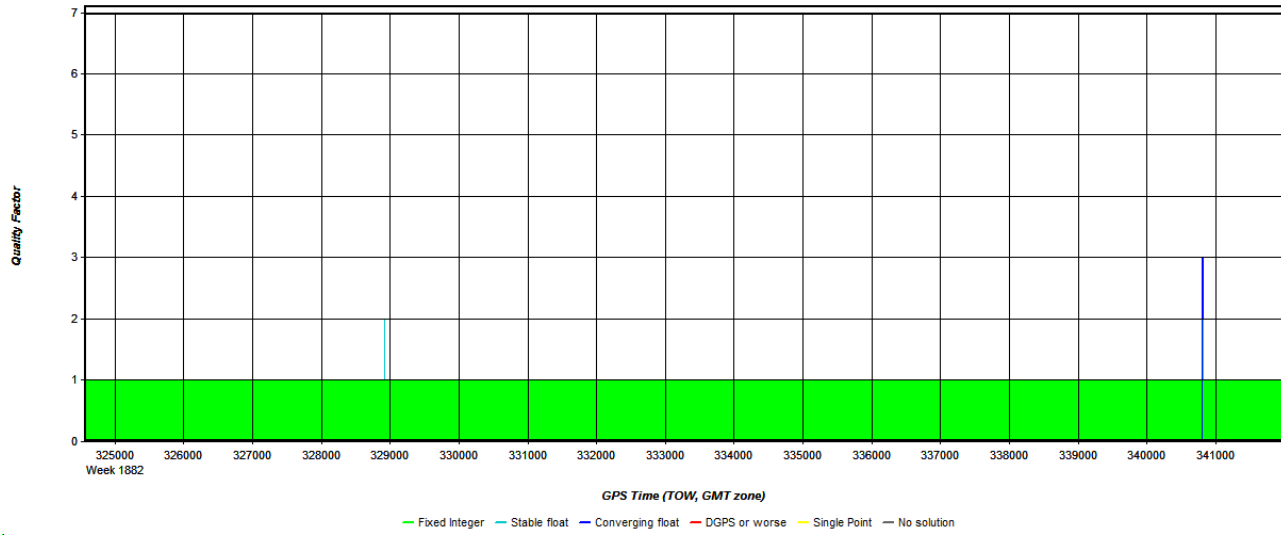


Estimated Accuracy

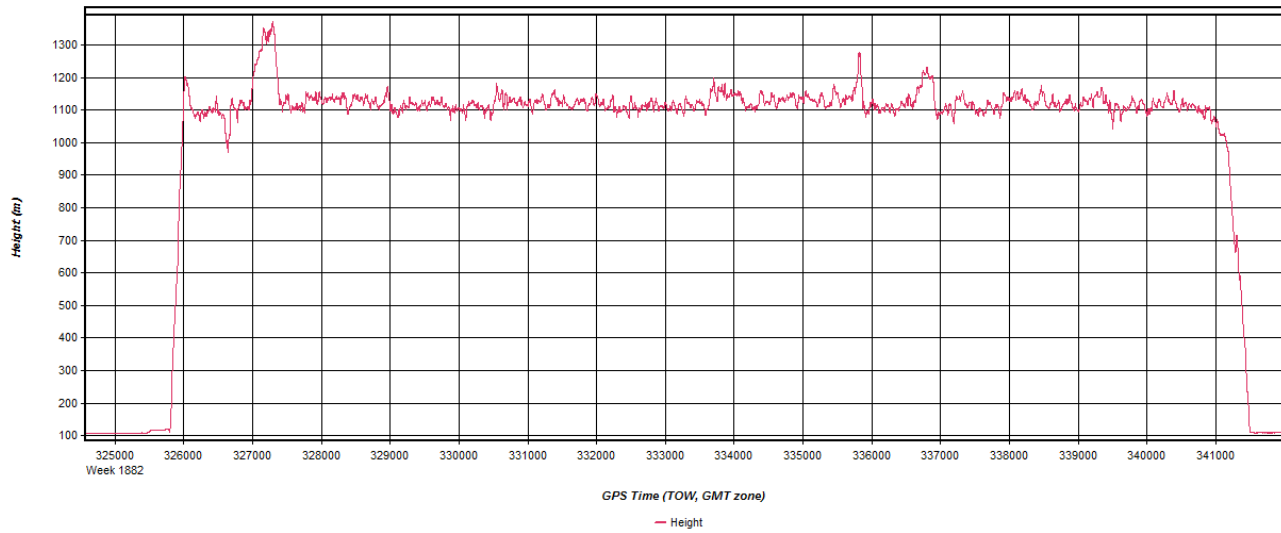




Quality Factor

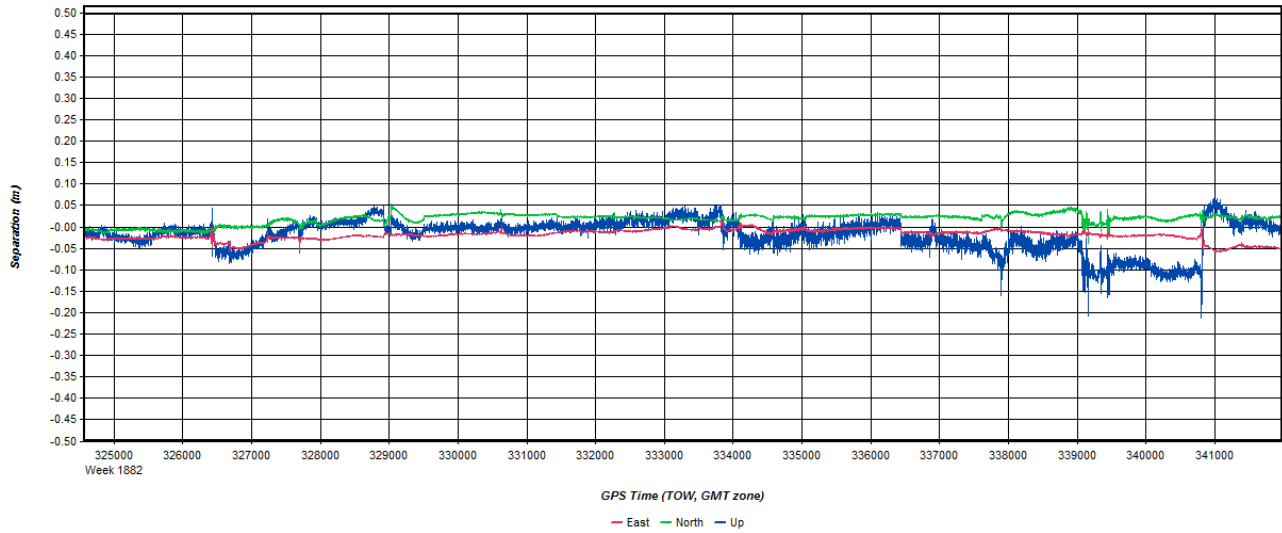


Height

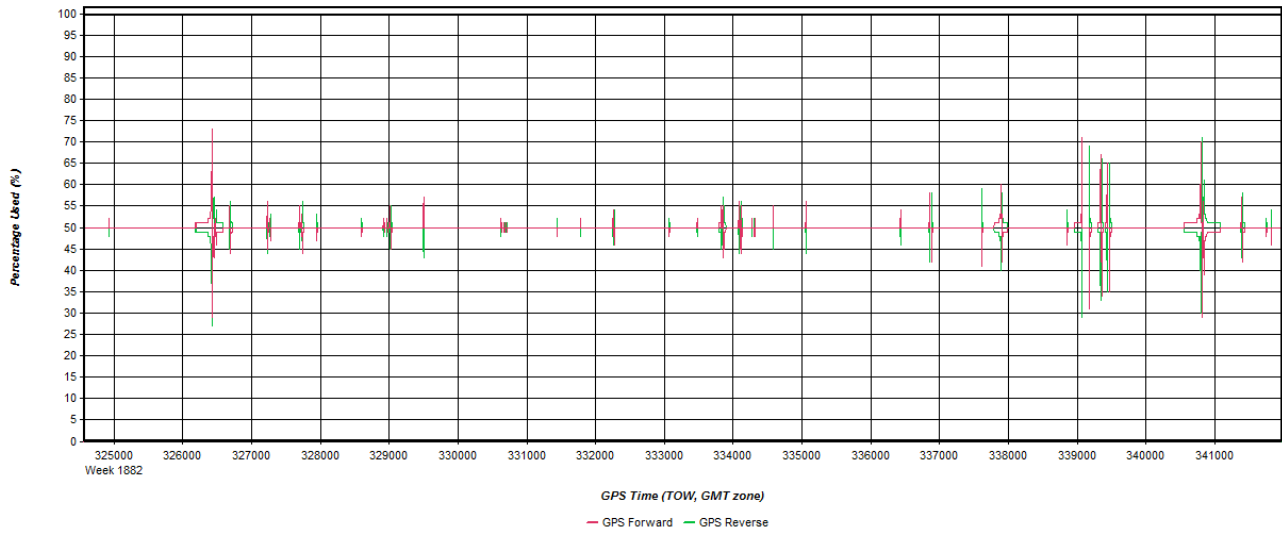




Combined Forward/Reverse Separation

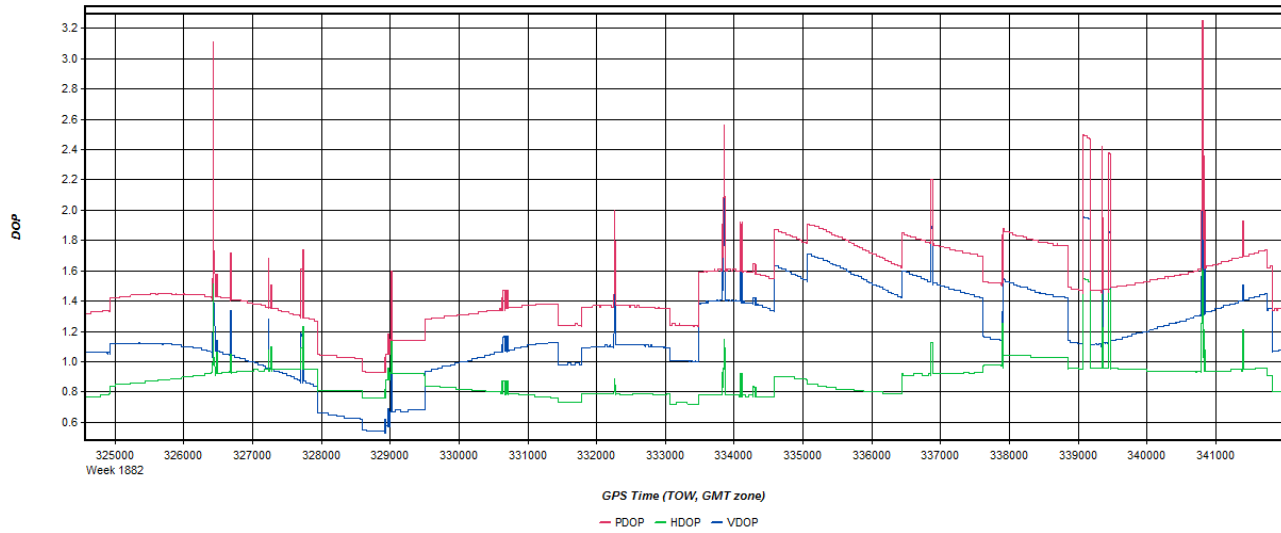


Combined Forward/Reverse Weighting

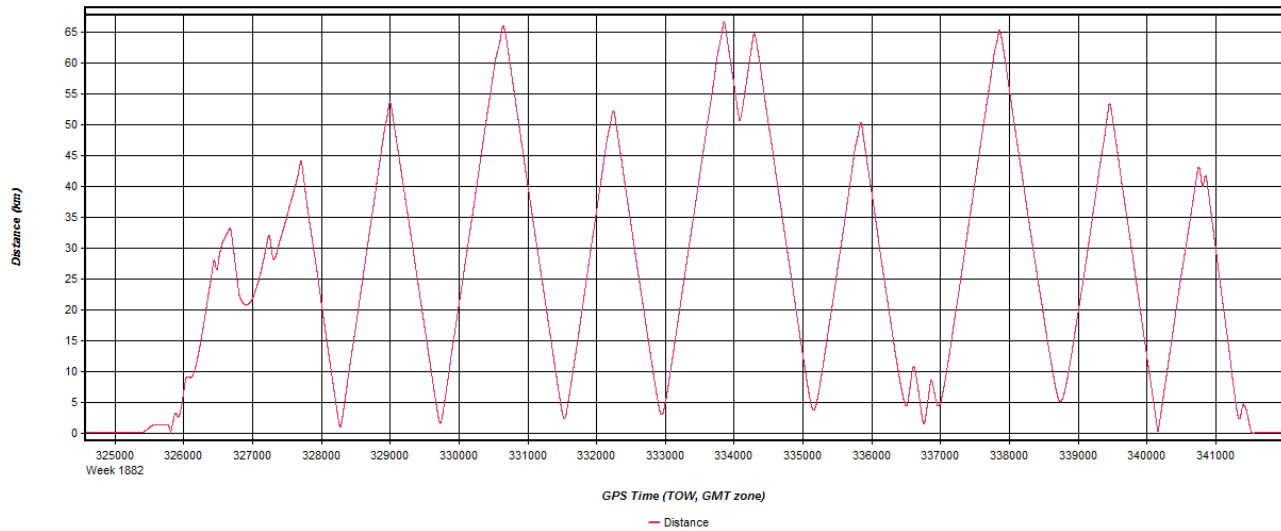




PDOP

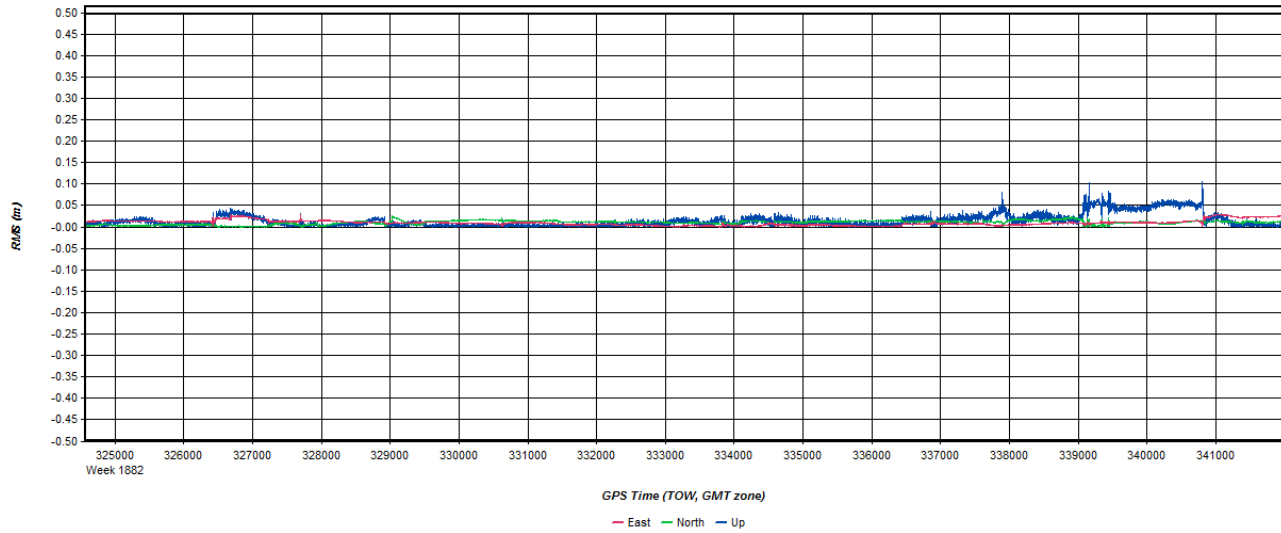


Distance from Base

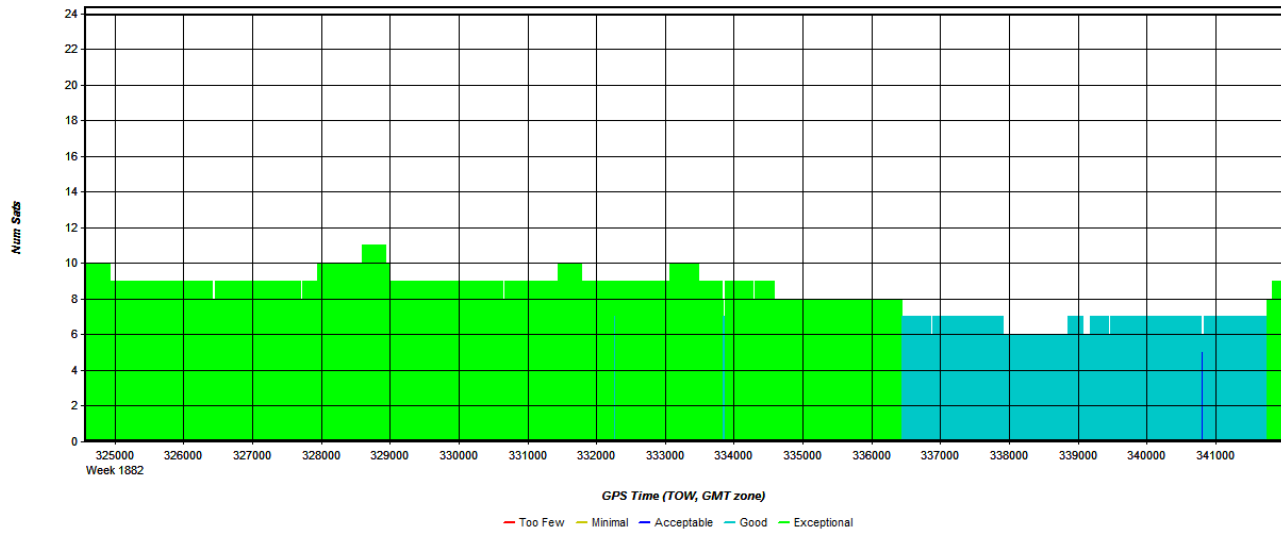




Combined RMS



SVs





Acquisition and Processing details ----- Collection 7 (February 4, 2016)

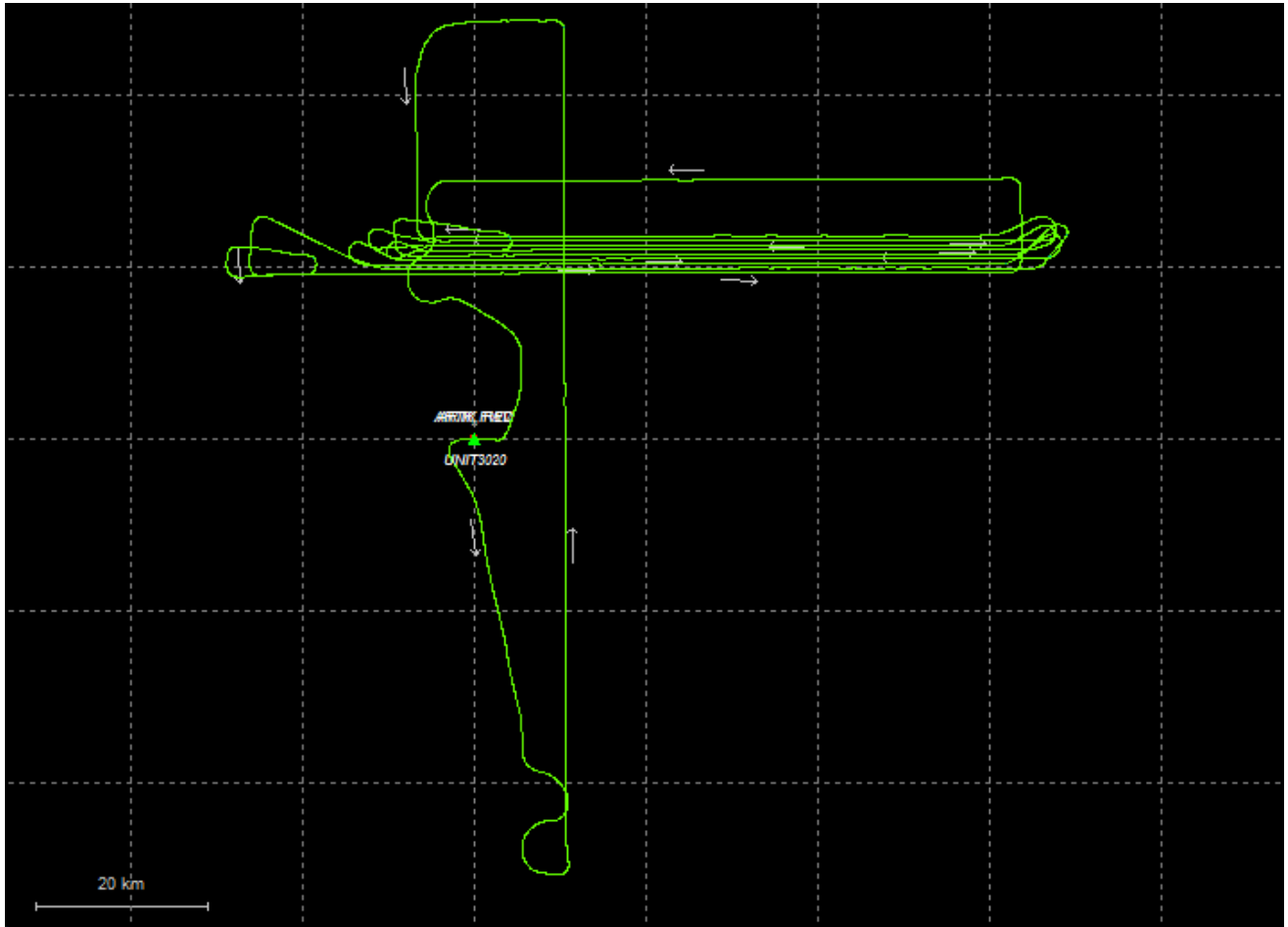
Log:

15.2		Lift Begin			Lift End			Flt	Flt	Hobbs	Activity
1	2	3	4	5	6	7	Duration	Hrs	Hrs		
1	H35	16:26	9807.1	H35	21:20	9812.0	4:54	5.00	4.9	0900-Production	
2											
3											

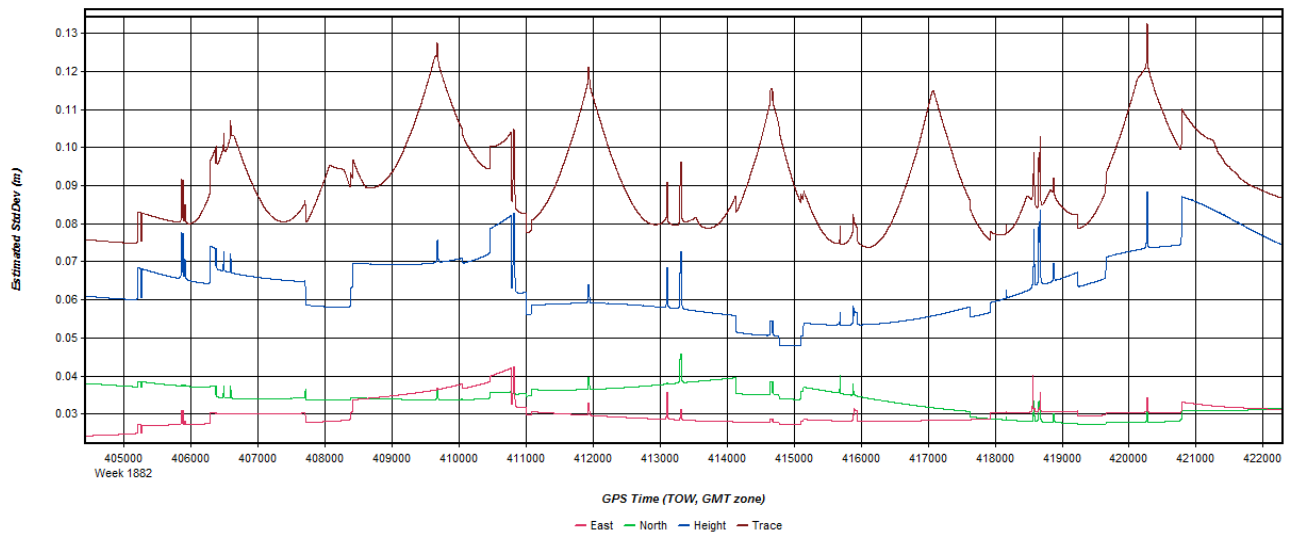
Q680i Flight Log

FGL Job # 22.15005200		Project Name FEMA Dardanelle Reserv			Operator Leonid Ereneeov		Unit 165	IMU -	Ground Temp °C 1.0 8.0		Mn Range' 2100	Data Logger Drives DR680-12			
Flight Date 4-Feb-16		GPS Day 16-035	Lift 7	System R680I	Pilot Jim Cross		Sun* -	Solar Times (UTC) -	Pulse Rate 240000	Flying Temp °C -5.0 -5.0		Max Range' 4052	Download Drive EP750#69		
Mission ID (yyymmdd_Sen_Job_Lift) 160204_165_15005200_07		Aircraft N62912	Airport ID H35	FMS CCNS 7	UTC -6	AMT (ft) 3400	Speed 140	FOV -	Scan Rate (Hz) 100	MTA 2	km/WPT 0.623	Altitude Setting 30.46 30.30	Humidity @ Alt 48	Shipping Track 877069506361	
Base 1 ID H35	Location H35		Rec ID GR3Unit3	Ant ID GR3Unit3	ARP (m) 1.8	Start Time (UTC) 04-Feb-16 15:00		Stop Time (UTC) 00-Jan-00 21:40		GPS Filename UNIT30204P		Operator Jacob Amundson	Data With AB		
Area	Flight #	Client	Wpt	Distance		UTC		Dir	Altitude (GPS)	Speed (knots)	Scan Rate	Comments and Conditions		SVs	PDOP
				From	To	Begin	End					Start	End		
													GPS ground static, delayed due to issues with CCNS	18	1.1
													S-turn for IMU alignment	18	1.2
680FT2	52		1	120	0	74.1	17:01:00	17:20:00	N	3,775	131	100.0	X-tie, full line	19	1.1
	11		1	99	0	61.1	17:30:00	17:45:00	E	4,440	135	100.0		21	1.0
	10		100	1	61.7	0	17:49:00	18:04:00	W	4,540	139	100.0		20	1.0
	9		1	102	0	62.9	18:08:00	18:23:00	E	4,510	134	100.0		19	1.0
	8		102	1	62.9	0	18:27:00	18:42:00	W	4,495	130	100.0		17	1.2
	8		1	10	0	5.6	18:46:00	18:47:00	E	4,490	142	100.0	calibration line	17	1.1
	7		1	103	0	63.5	18:53:00	19:09:00	E	4,480	143	100.0		16	1.2
	6		107	1	66	0	19:12:00	19:29:00	W	4,540	144	100.0		19	1.0
	5		1	108	0	66.7	19:32:00	19:48:00	E	4,450	139	100.0		17	1.2
	4		110	1	67.9	0	19:53:00	20:10:00	W	4,380	124	100.0		17	1.1
	3		1	132	0	81.6	20:21:00	20:41:00	E	4,460	132	100.0		16	1.2
	23		92	1	56.7	0	20:45:00	21:00:00	W	4,530	145	100.0	this is a refligt	17	1.3
							21:01:00	21:04:00					S-turn for IMU alignment	16	1.1
							21:11:00	21:16:00					GPS ground static	15	1.2

Trajectory and GPS Plots:

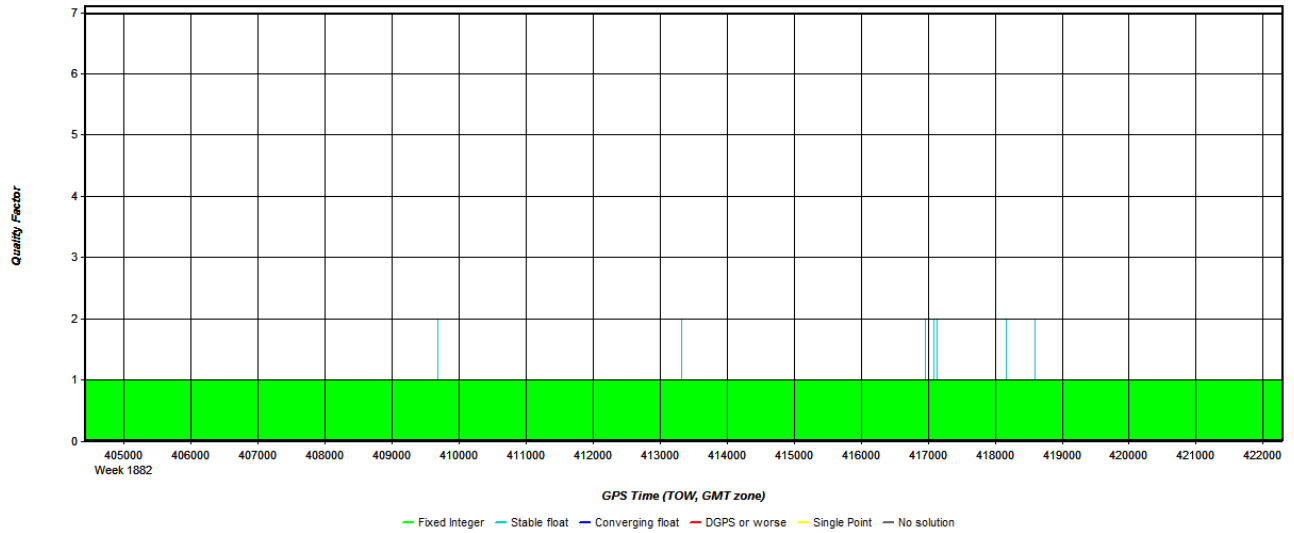


Estimated Accuracy

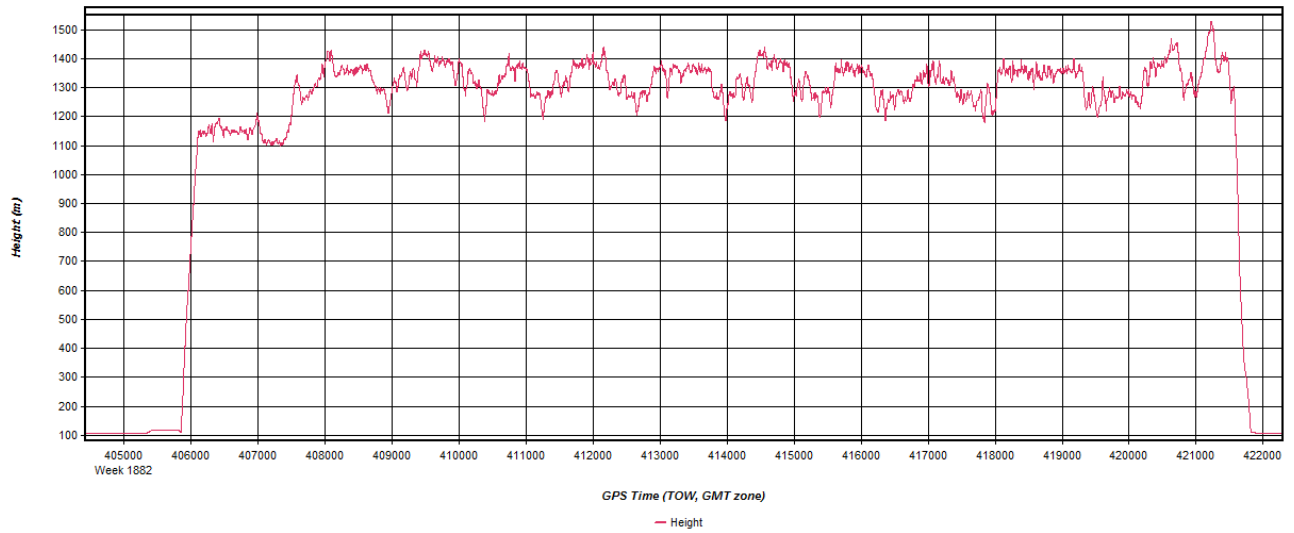




Quality Factor

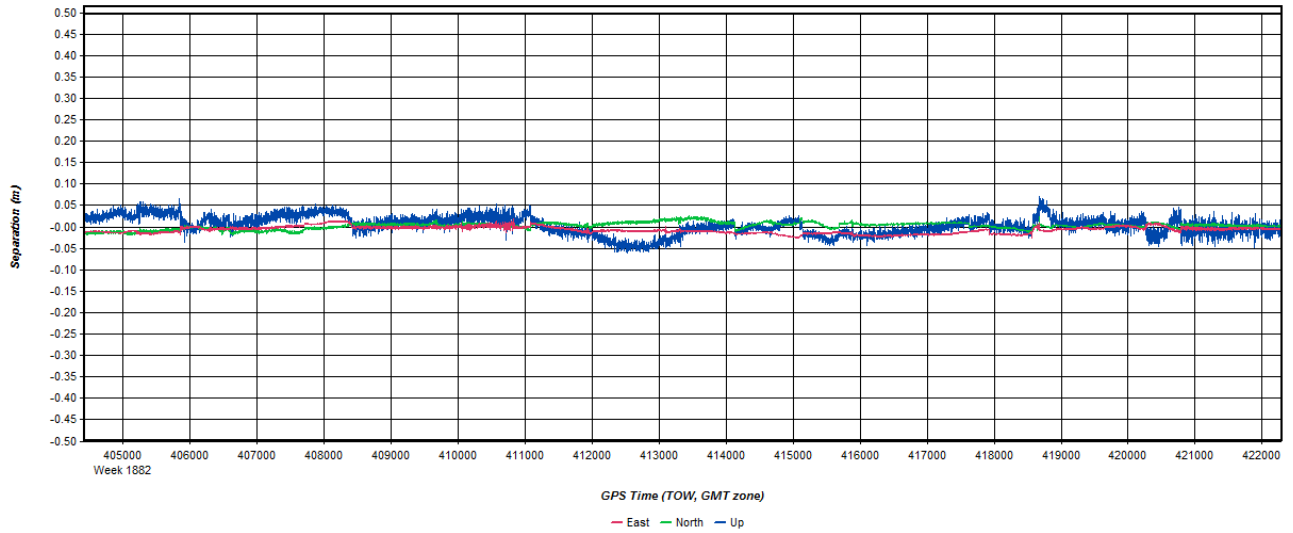


Height





Combined Forward/Reverse Separation

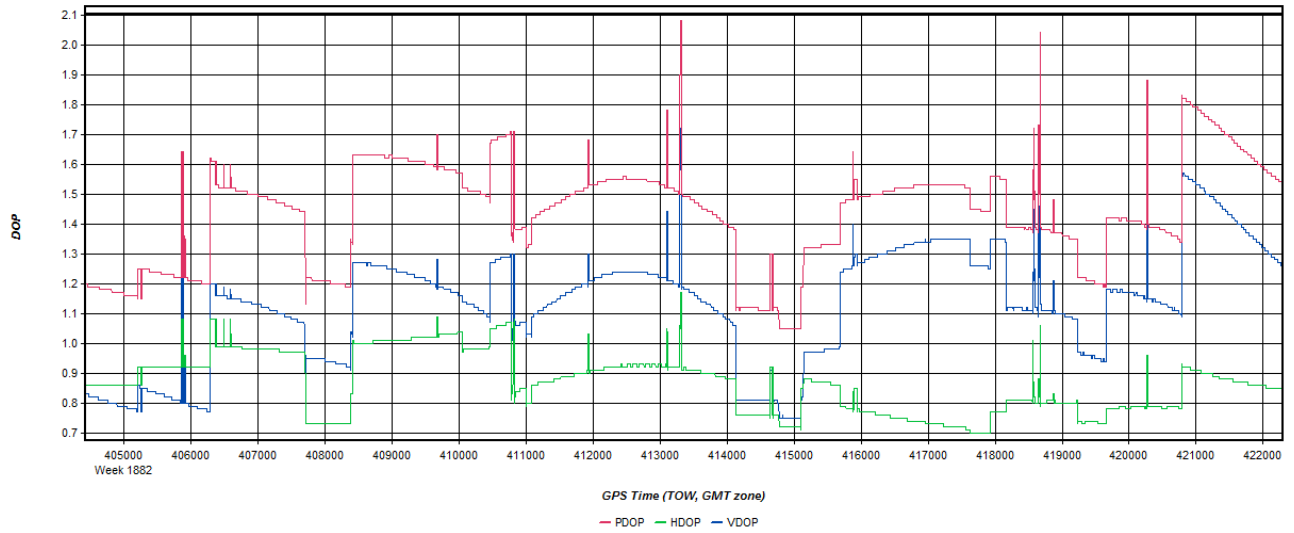


Combined Forward/Reverse Weighting

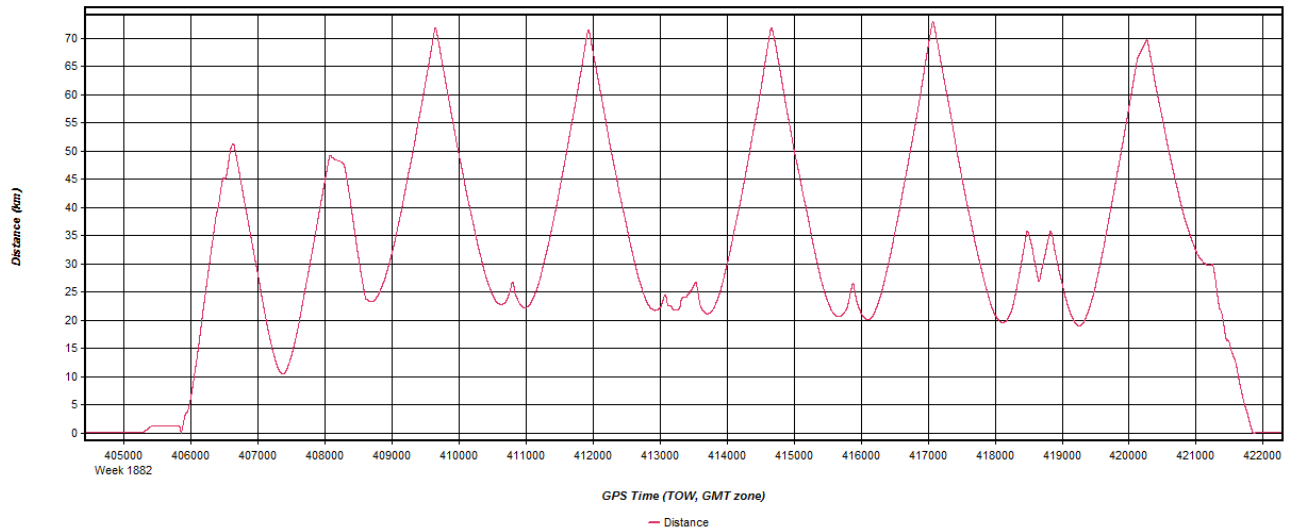




PDOP

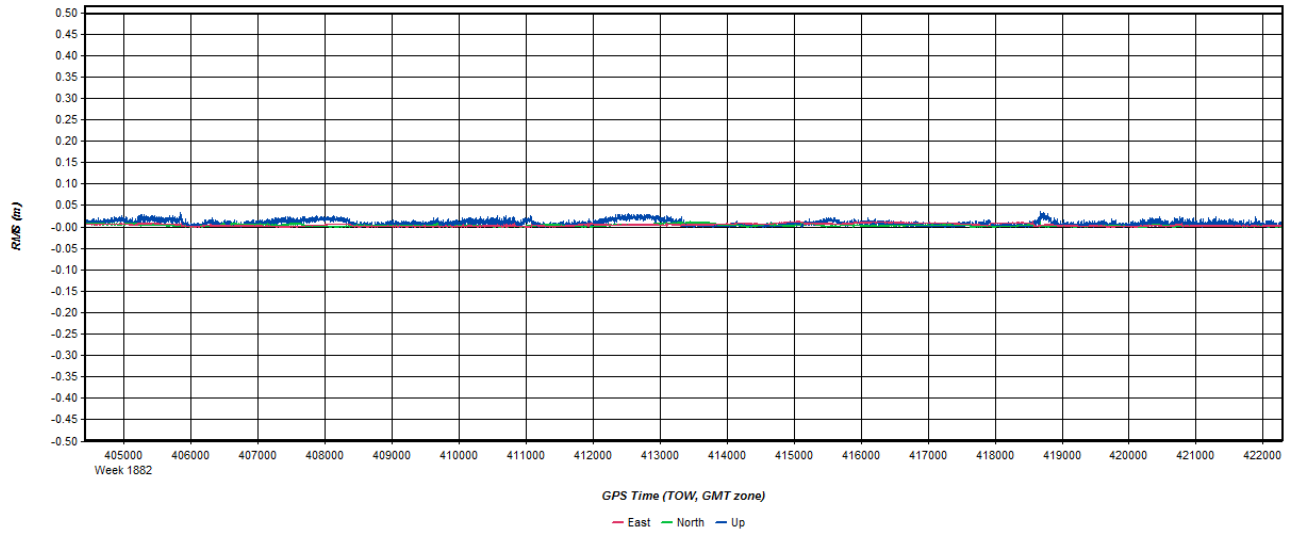


Distance from Base

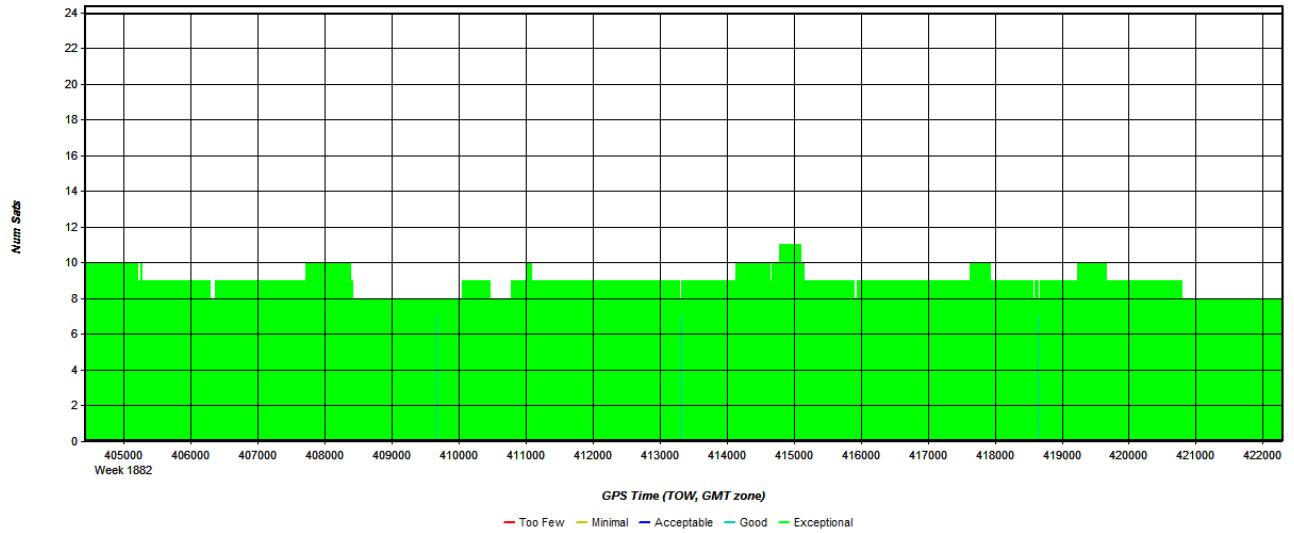




Combined RMS



SVs





Acquisition and Processing details ----- Collection 8 (February 4, 2016)

Log:



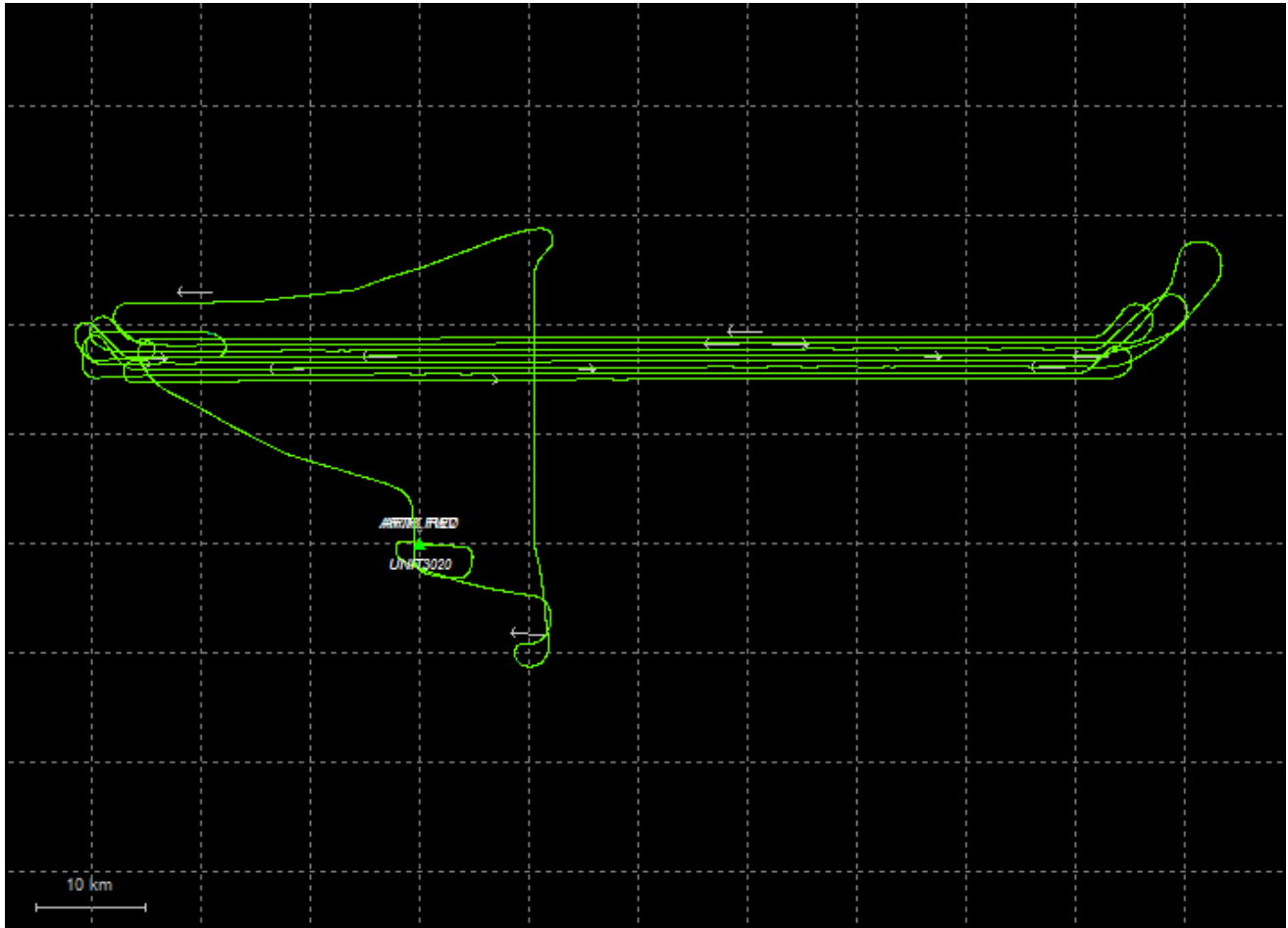
Fugro Geospatial, Inc.

15.2	Lift Begin			Lift End			Fit Duration	Fit Hrs	Hobbs Hrs	Activity
	Airport	Chocks	Hobbs	Airport	Chocks	Hobbs				
1	H35	22:14	9812.0	H35	2:19	9816.2	4:05	4.00	4.2	0900-Production
2										
3										

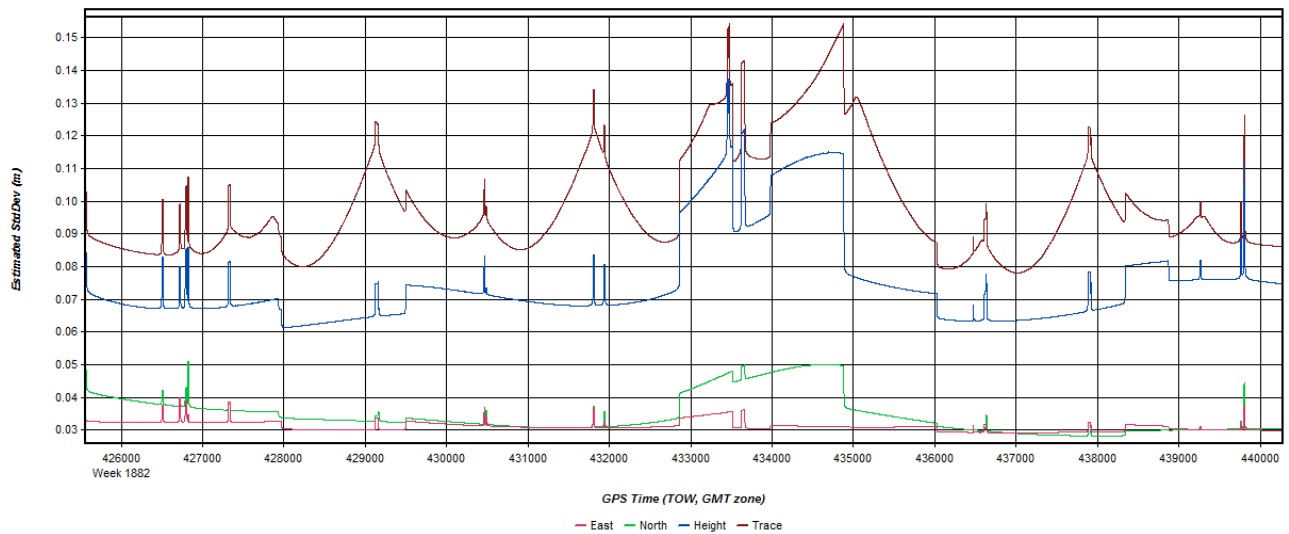
Q680i
Flight Log

FGI Job #	Project Name				Operator		Unit	IMU	Ground Temp °C			Mn Range'	Data Logger Drives		
22.15005200	FEMA Dardanelle Reserv				Leonid Ereneeov		165	-	8.0	-4.0	2100	DR680-10			
Flight Date	GPS Day	Lift	System	Pilot		Sun*	Solar Times (UTC)	Pulse Rate			Flying Temp °C	Max Range'	Download Drive		
4-Feb-16	16-035	8	R680I	Corry Lane		-	-	240000			-7.0 -7.0	4052	EP750#69		
Mission ID (yyymmdd_Sen_Job_Lift)	Aircraft	Airport ID	FMS	UTC	AMT (ft)	Speed	FOV	Scan Rate (Hz)	MTA	km/WPT	AltM Setting	Humidity @ Alt	Shipping Track		
160204_165_15005200_08	N62912	H35	CCNS 7	-6	3400	140	-	100	2	0.623	30.30 30.37	-	877069506361		
Base 1 ID	Location		Rec ID	Ant ID	ARP (m)	Start Time (UTC)		Stop Time (UTC)		GPS Filename		Operator	Data		
H35	H35		GR3Unit3	GR3Unit3	1.8	04-Feb-16 15:00		00-Jan-00 21:40		UNIT30204P		Jacob Amundson	With AB		
Area	Flight #	Client	Wpt	Distance		UTC		Dir	Altitude (GPS)	Speed (knots)	Scan Rate	Comments and Conditions		SVs	PDOP
				From	To	Begin	End					Start	End		
												GPS ground static		14	1.3
												S-turn for IMU alignment		15	1.3
680TF2	52		70	85	43	52.3	22:38:00	22:40:00	N	4,360	156	?	X-tie, partial	15	1.4
	2		1	132	0	81.6	22:52:00	23:10:00	E	4,290	149	?		17	1.1
	1		132	1	81.6	0	23:13:00	23:32:00	W	4,120	145	?		18	1.1
680TF1	97		1	137	0	84.7	23:35:00	23:54:00	E	4,450	146	?		17	1.2
	96		137	1	84.7	0	23:58:00	0:18:00	W	4,030	142	?	might be a 1 mile-log gap @WP125, covered with sidelap	16	1.3
	96		1	10	0	5.6	0:22:00	0:23:00	E	4,460	141	?	calibration line	18	1.1
	95		1	135	0	83.5	0:28:00	0:46:00	E	4,495	143	?	CCNS froze up in turn, had to restart it multiple times.	17	1.2
	94		135	1	83.5	0	0:54:00	1:14:00	W	4,070	149	?		16	1.3
	93		1	135	0	83.5	1:17:00	1:36:00	E	4,320	147	?		18	1.1
	92		135	1	83.5	0	1:39:00	1:59:00	W	4,190	135	?		18	1.2
							1:59:00	2:02:00					S-turn for IMU alignment	17	1.3
							2:12:00	2:17:00					GPS ground static	17	1.3

Trajectory and GPS Plots:

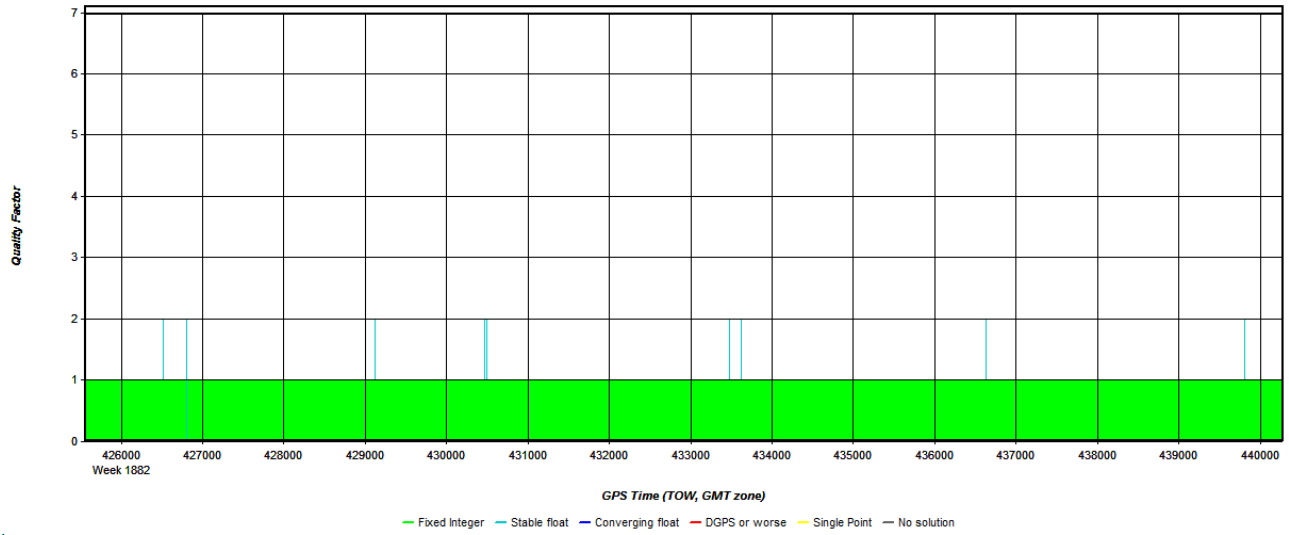


Estimated Accuracy

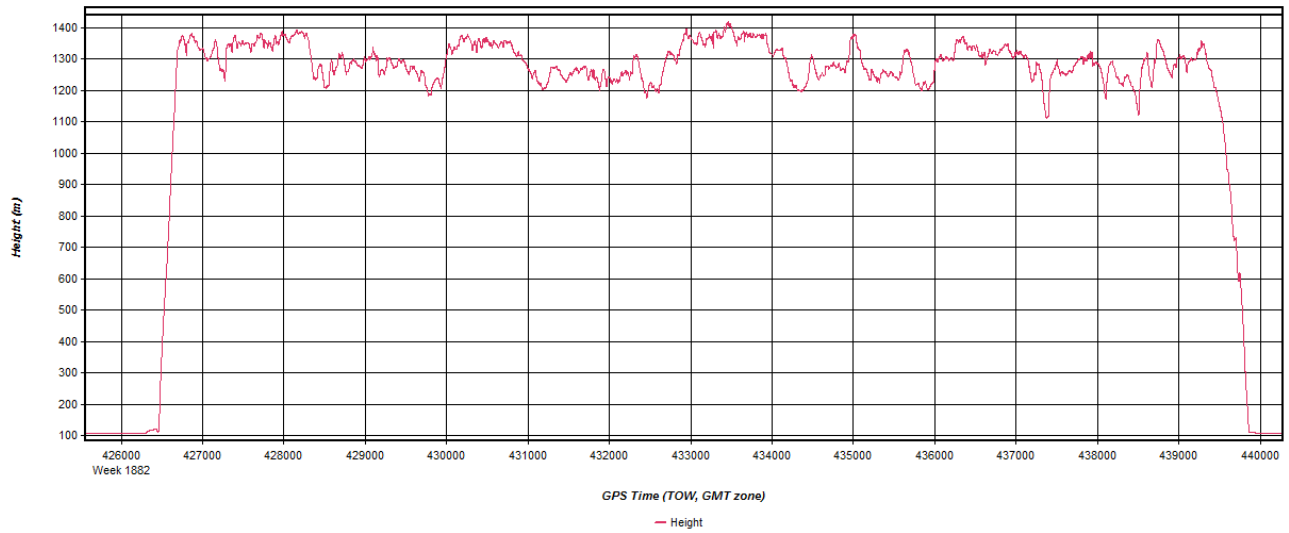




Quality Factor

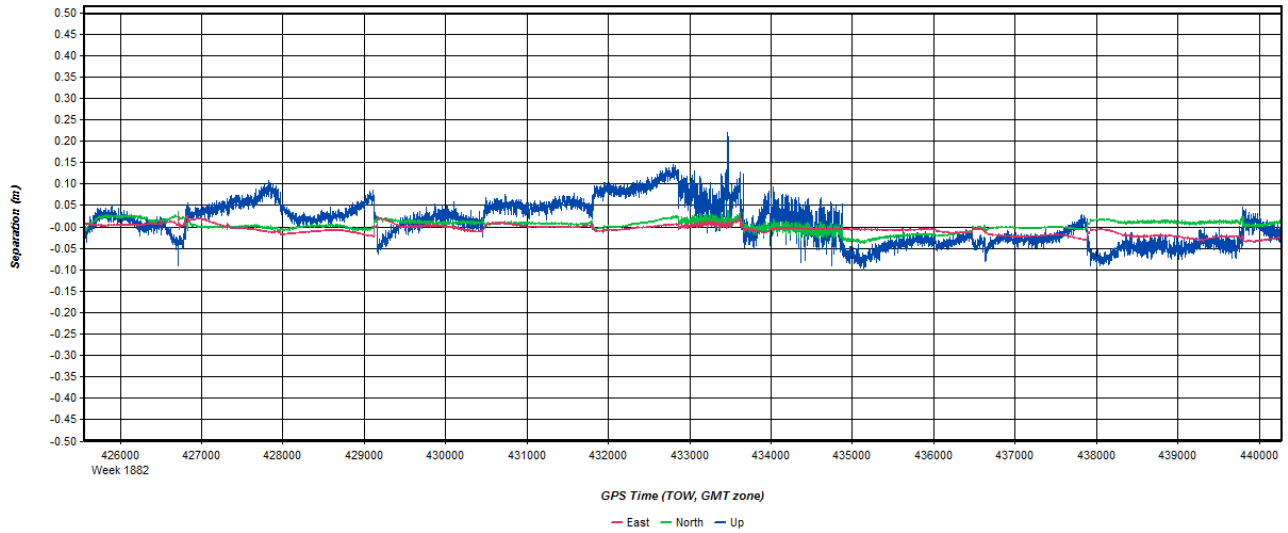


Height

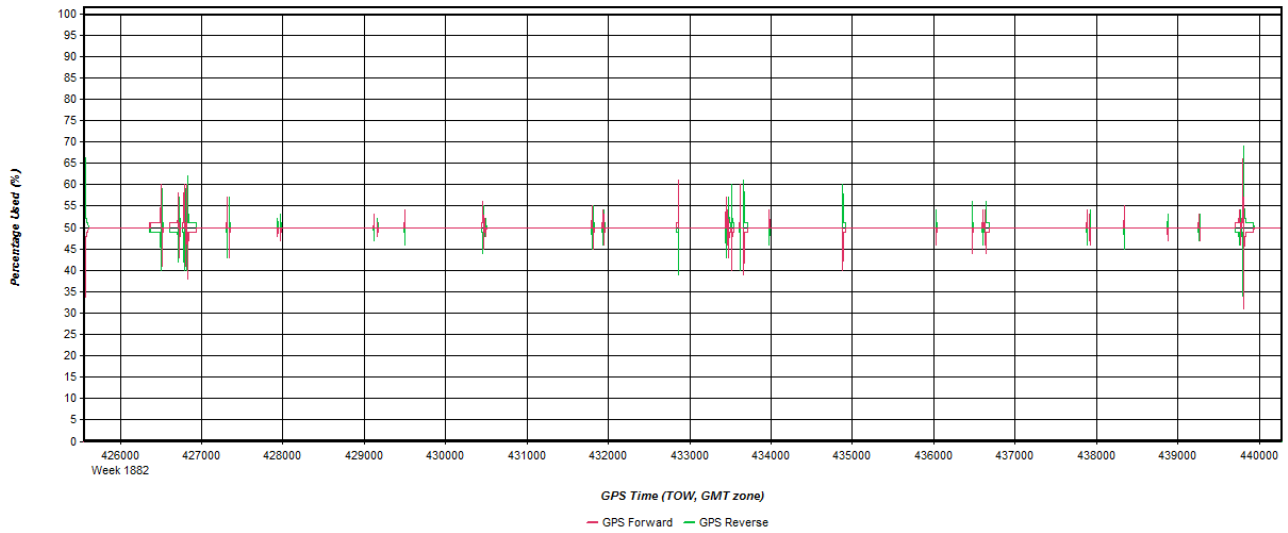




Combined Forward/Reverse Separation

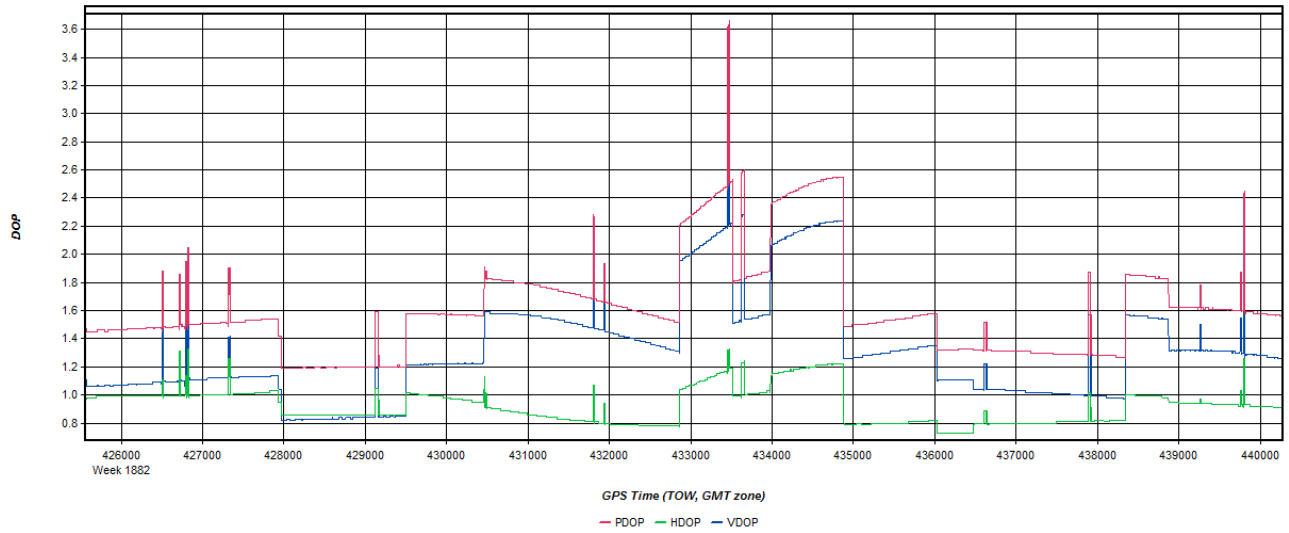


Combined Forward/Reverse Weighting

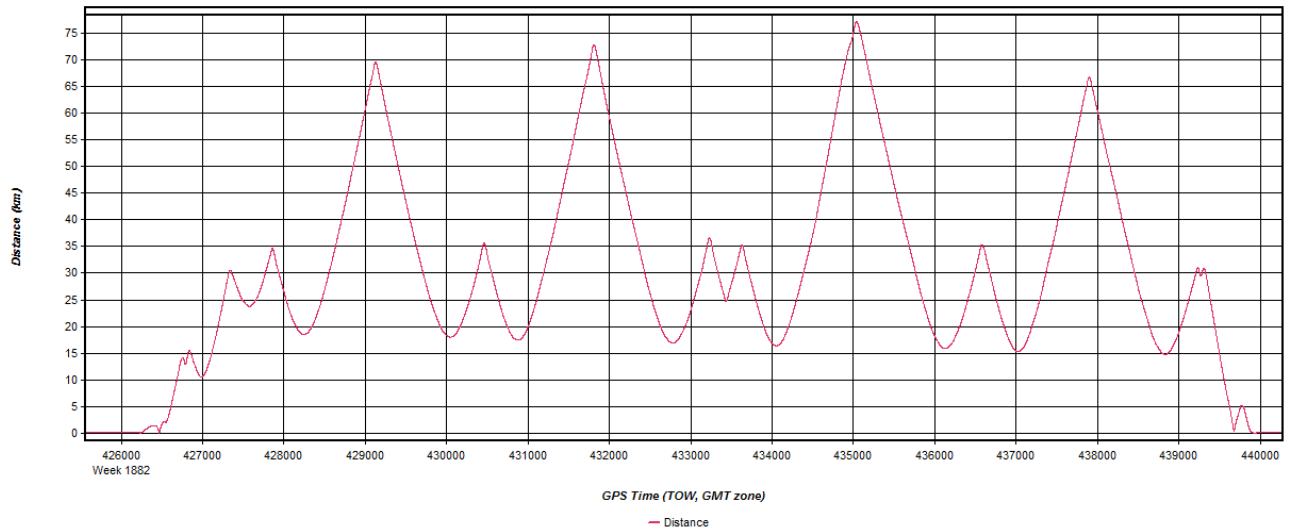




PDOP

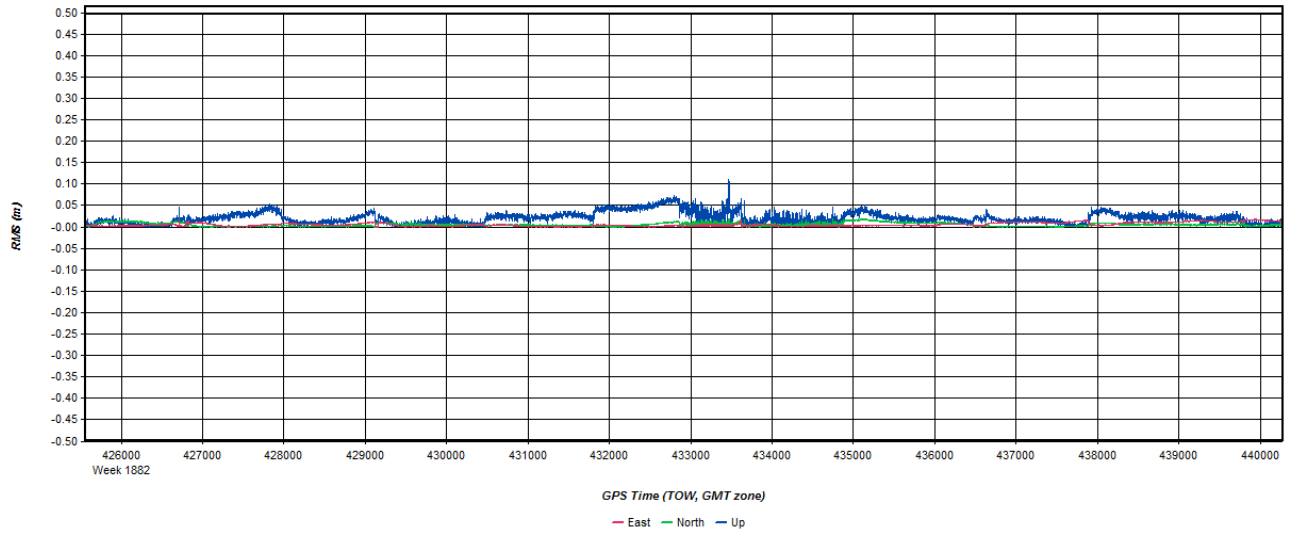


Distance from Base

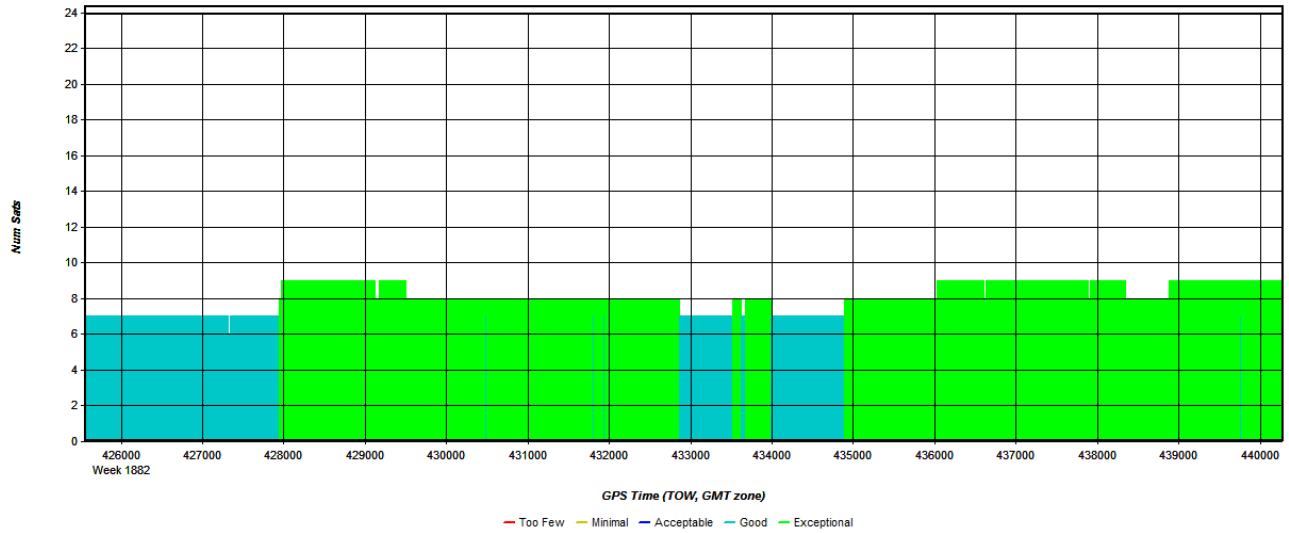




Combined RMS



SVs





Acquisition and Processing details ----- Collection 9 (February 5, 2016)

Log:



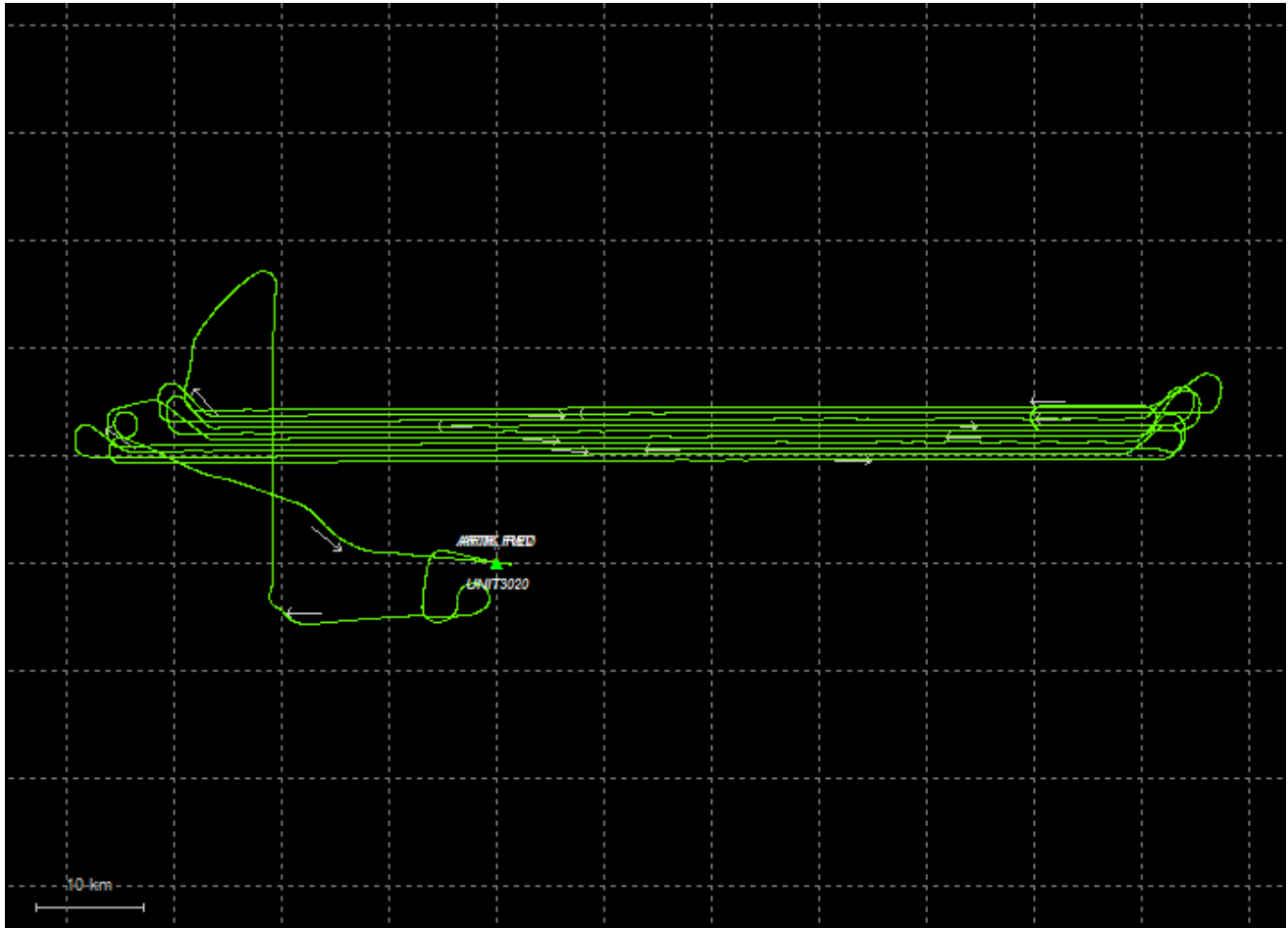
Fugro Geospatial, Inc.

15.2	Lift Begin			Lift End			Fit Duration	Fit Hrs	Hobbs Hrs	Activity
	Airport	Chocks	Hobbs	Airport	Chocks	Hobbs				
1	H35	16:05	9816.2	H35	21:00	9821.1	4:55	5.00	4.9	0900-Production
2										
3										

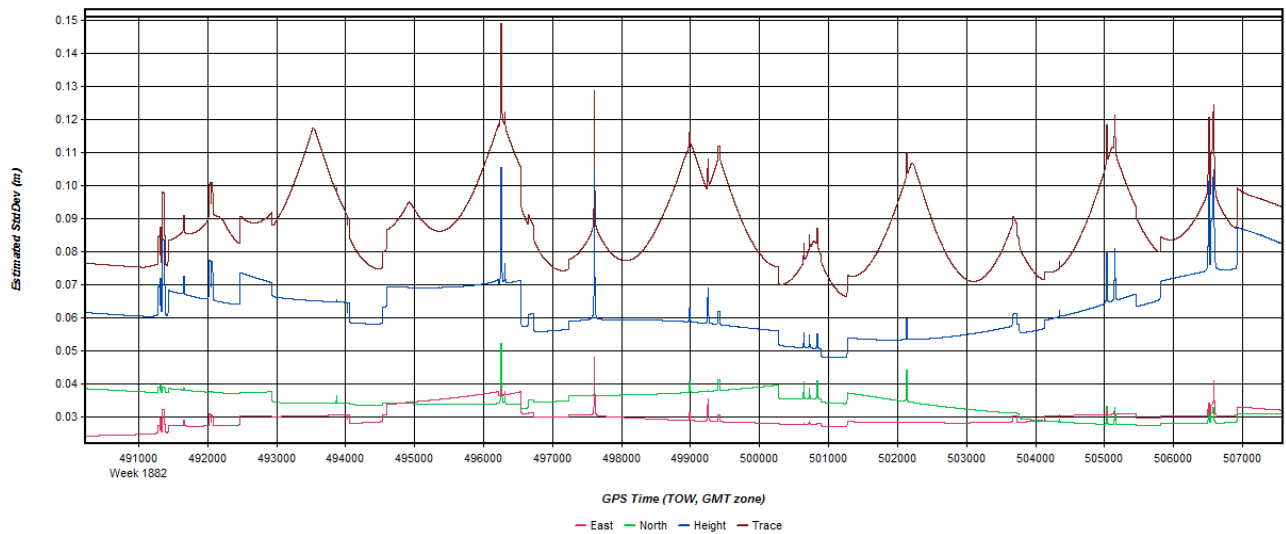
Q680i
Flight Log

FGI Job #	Project Name				Operator		Unit	IMU				Ground Temp °C	Mn Range'	Data Logger Drives			
22.15005200	FEMA Dardanelle Reserv				Leonid Eremeev		165	-				2.0	10.0	DR680-12			
Flight Date	GPS Day	Lift	System	Pilot		Sun*	Solar Times (UTC)		Pulse Rate			Flying Temp °C	Max Range'	Download Drive			
5-Feb-16	16-036	9	R680i	Corry Lane		-	-		240000			-3.0	-4.0	4052	EP750#22		
Mission ID (yyymmdd_Sen_Job_Lift)		Aircraft	Airport ID	FMS	UTC	AMT (ft)	Speed	FOV	Scan Rate (Hz)	MTA	km/WPT	Alt Setting	Humidity @ Alt	Shipping Track			
160205_165_15005200_09		N62912	H35	CCNS 7	-6	3400	140	-	100	2	0.623	30.48	30.38	-			
Base 1 ID	Location	Rec ID	Ant ID	ARP (m)	Start Time (UTC)		Stop Time (UTC)		GPS Filename			Operator		Data			
H35	H35	GR3Unit3	GR3Unit3	1.8	05-Feb-16 15:06		05-Feb-16 21:11					Leonid Eremeev		With AB			
Area	Flight #	Client	Wpt	Distance		UTC		Dir	Altitude (GPS)	Speed (knots)	Scan Rate	Comments and Conditions			SVs	PDOP	
				From	To	Begin	End					Start	End				
												GPS ground static			18	1.3	
												S-turn for IMU alignment			19	1.1	
680FT2	51		60	95	36.8	58.6	16:33:00	16:39:00	N	3,645	157	?	X-tie, partial			19	1.1
680FT1	91		1	135	0	83.5	16:44:00	17:03:00	W	4,185	145	?				18	1.1
	90		135	1	83.5	0	17:06:00	17:26:00	E	4,230	144	?				20	1.0
	89		1	135	0	83.5	17:30:00	14:49:00	W	4,230	135	?				21	1.0
	88		135	1	83.5	0	17:52:00	18:11:00	E	4,150	147	?				19	1.0
	87		1	135	0	83.5	18:14:00	18:34:00	W	4,175	140	?				17	1.2
	87		135	125	83.5	77.3	18:38:00	18:40:00	E	4,275	135	?	calibration line			17	1.2
	86		132	1	81.6	0	18:44:00	19:03:00	E	4,100	140	?				19	1.0
	85		1	142	0	87.8	19:07:00	19:28:00	W	4,055	142	?				19	1.0
	84		142	1	87.8	0	19:31:00	19:52:00	E	4,190	141	?				17	1.3
	83		1	142	0	87.8	19:56:00	20:16:00	W	4,080	142	?				17	1.1
	82		145	1	89.7	0	20:19:00	20:40:00	E	4,110	145	?				16	1.2
							20:40:00	20:43:00					S-turn for IMU alignment			15	1.3
							20:54:00	20:59:00					GPS ground static			16	1.1

Trajectory and GPS Plots:

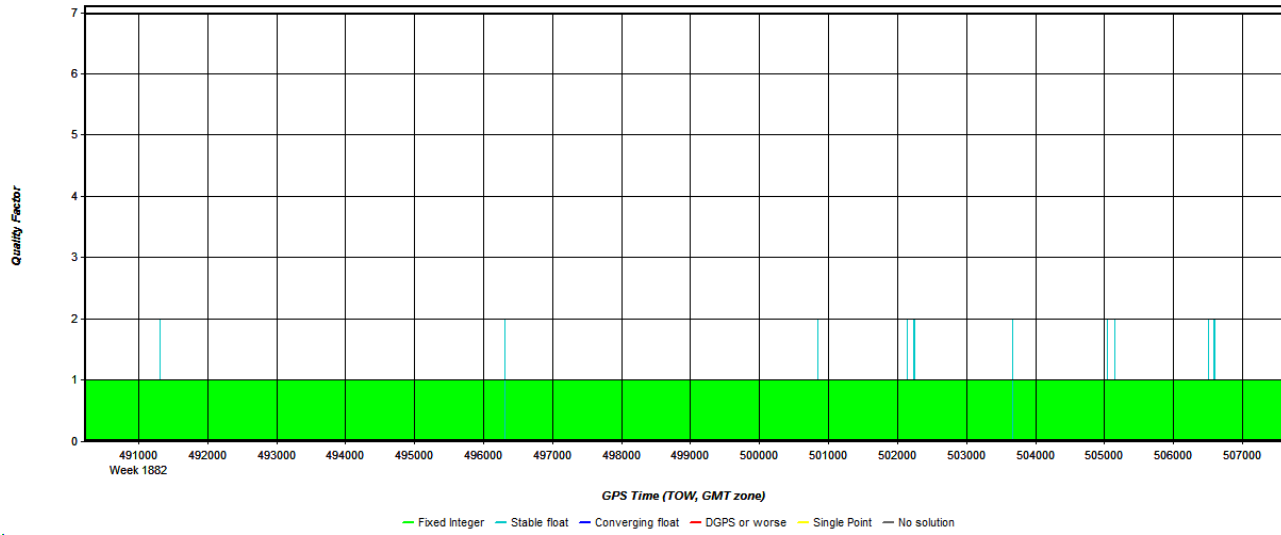


Estimated Accuracy

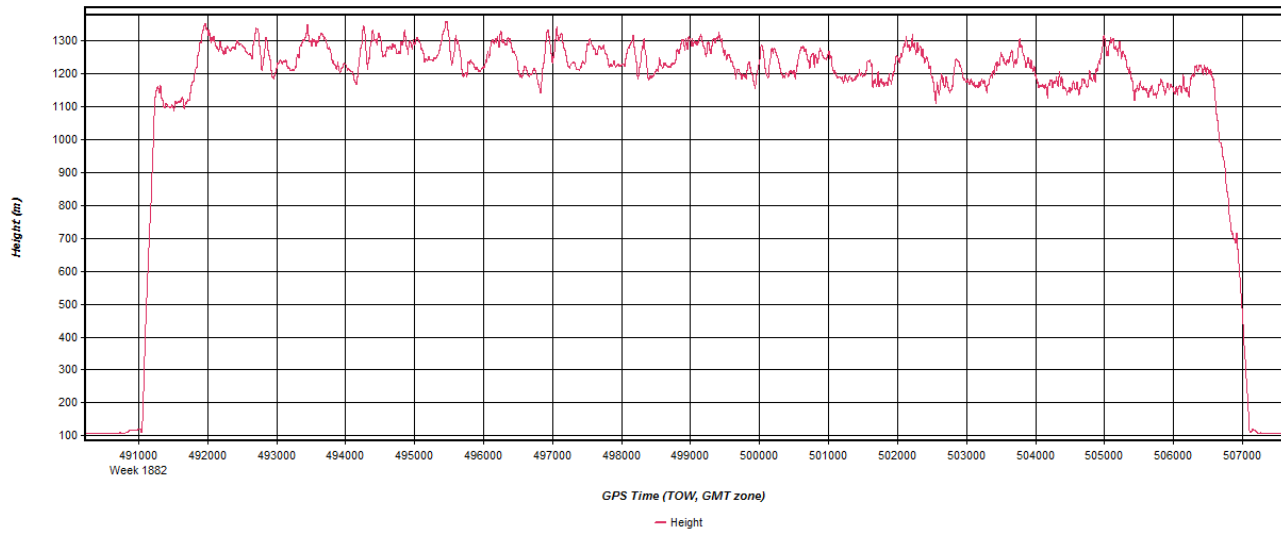




Quality Factor

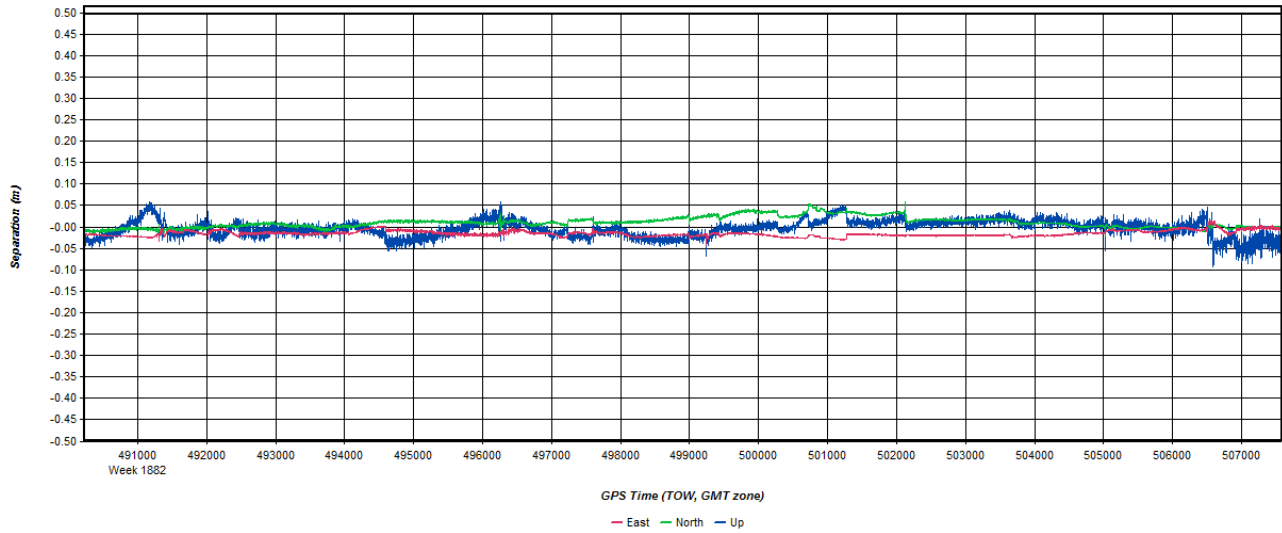


Height

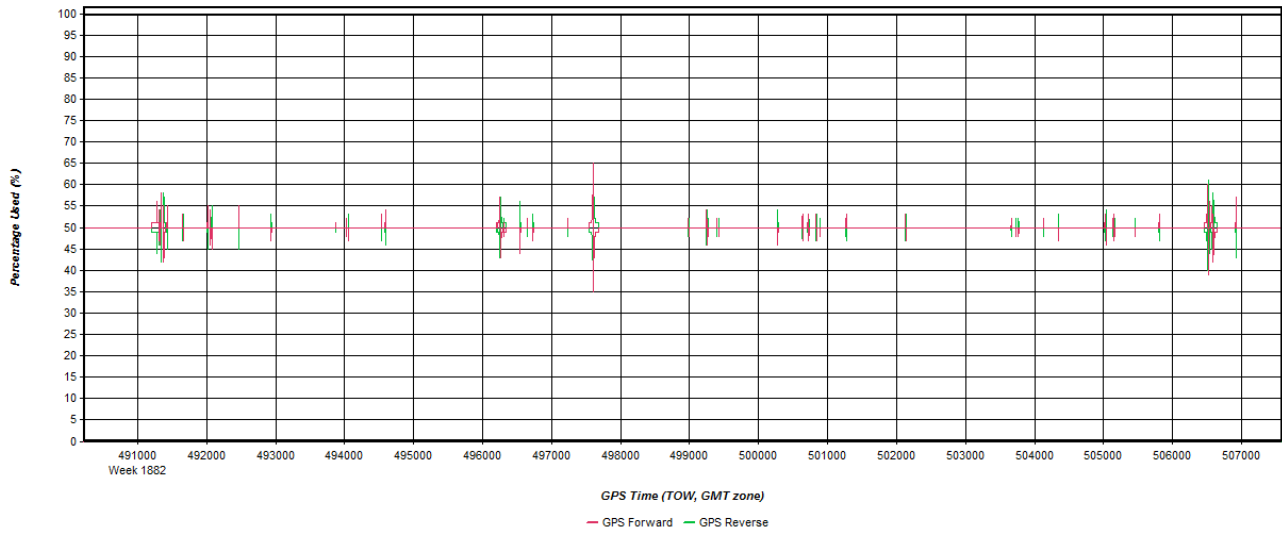




Combined Forward/Reverse Separation

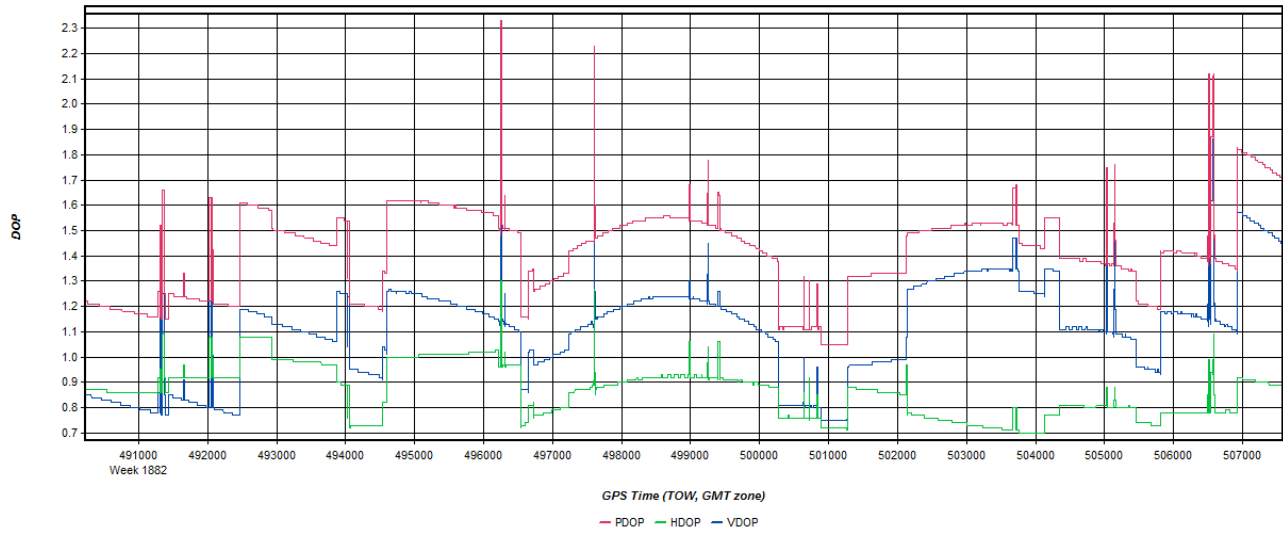


Combined Forward/Reverse Weighting

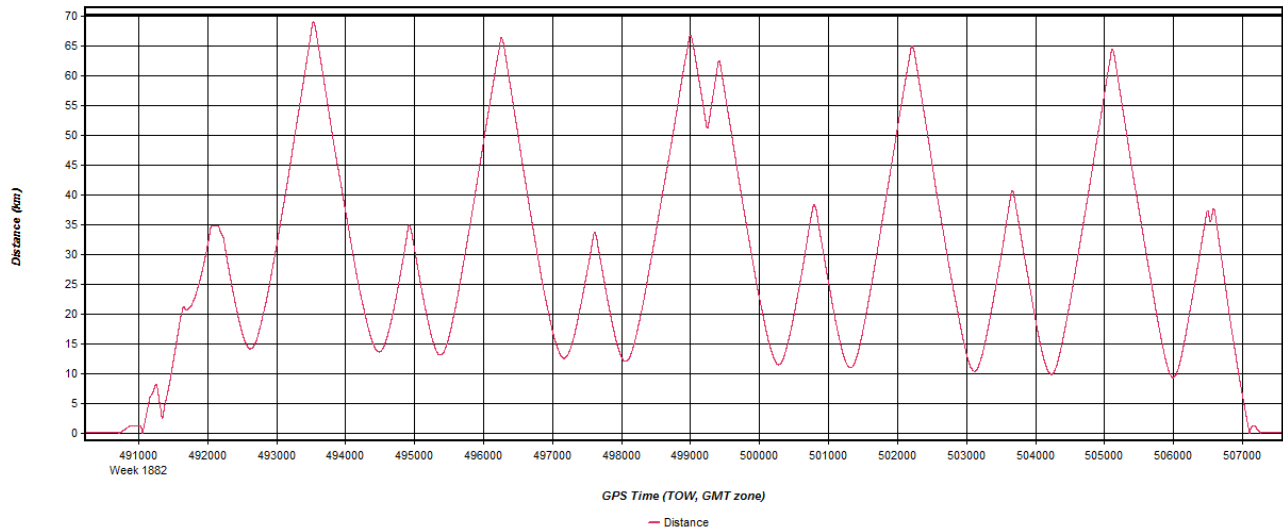




PDOP

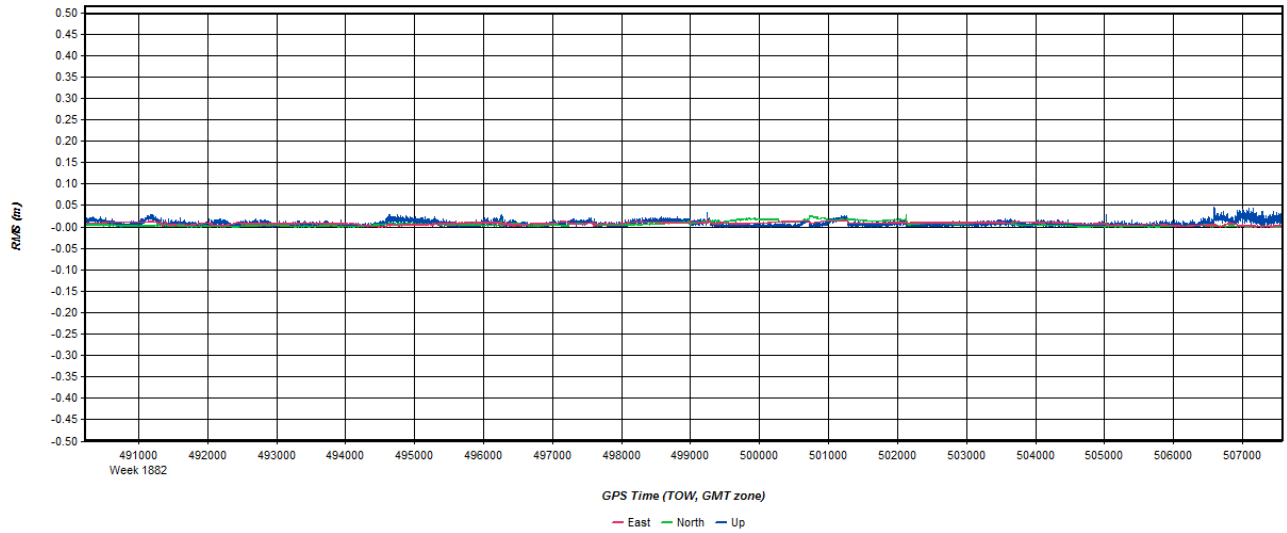


Distance from Base

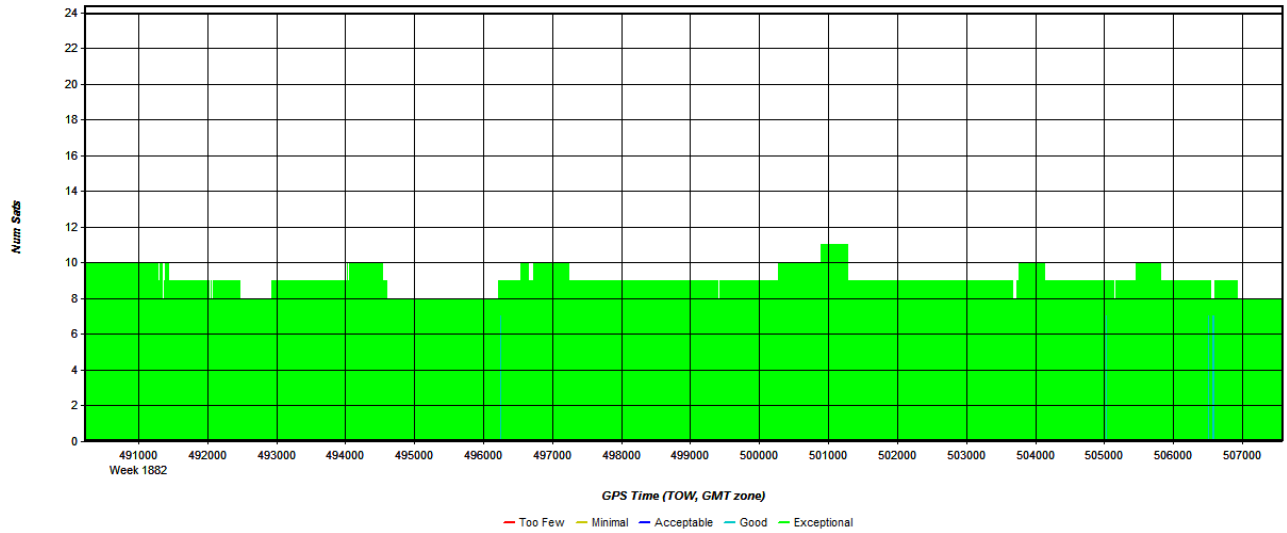




Combined RMS



SVs





Acquisition and Processing details ----- Collection 10 (February 5, 2016)

Log:



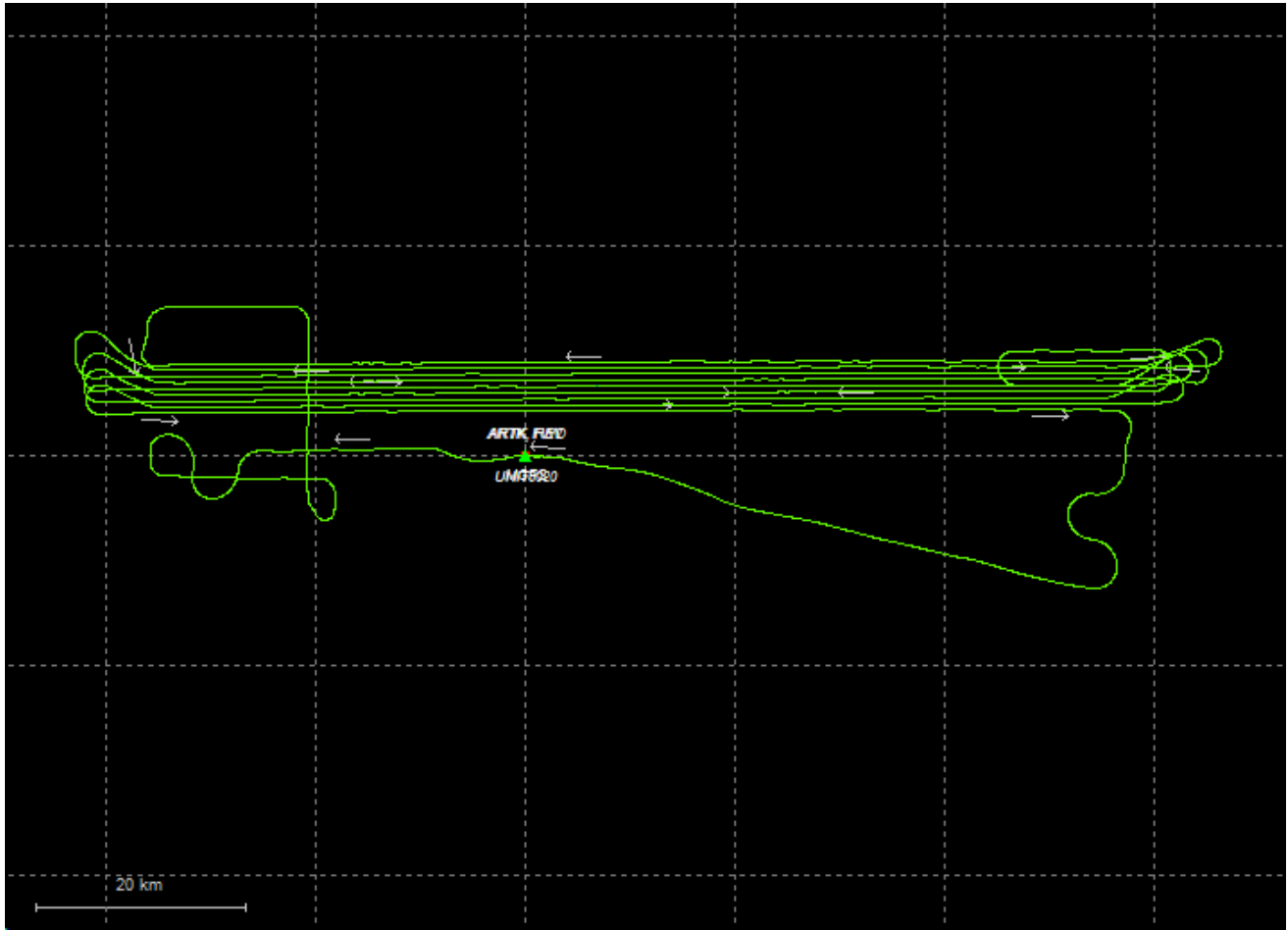
Fugro Geospatial, Inc.

15.2	Lift Begin			Lift End			Fit Duration	Fit Hrs	Hobbs Hrs	Activity
	Airport	Chocks	Hobbs	Airport	Chocks	Hobbs				
1	H35	1:45	9821.3	H35	7:03	9826.6	5:18	5:25	5:3	0900-Production
2										
3										

Q680i
Flight Log

FGI Job #	Project Name				Operator		Unit	IMU	Ground Temp °C				Mn Range'	Data Logger Drives	
22.15005200	FEMA Dardanelle Reserv				Jacob Amundson		165	-	-5.0 -4.0				2100	DR680-11	
Flight Date	GPS Day	Lift	System	Pilot		Sun*	Solar Times (UTC)		Pulse Rate		Flying Temp °C		Max Range'	Download Drive	
5-Feb-16	16-036	10	R680I	Jim Cross		-	-		240000		-2.0 -2.0		4052	EP750#22	
Mission ID (yyymmdd_Sen_Job_Lift)	Aircraft	Airport ID	FMS	UTC	AMT (ft)	Speed	FOV	Scan Rate (Hz)	MTA	km/WPT	Altitude Setting		Humidity @ Alt	Shipping Track	
160205_165_15005200_10	N62912	H35	CCNS 7	-6	3400	140	-	100	2	0.623	30.32 30.34		-	8083 6052 6905	
Base 1 ID	Location	Rec ID	Ant ID	ARP (m)	Start Time (UTC)		Stop Time (UTC)		GPS Filename		Operator		Data		
H35	H35	GR3Unit3	GR3Unit3	1.8	06-Feb-16 00:24		06-Feb-16 07:15		UNIT30206a.tps		Jacob Amundson		With AB		
Area	Flight #	Client	Wpt	Distance		UTC		Dir	Altitude (GPS)	Speed (knots)	Scan Rate	Comments and Conditions		SVs	PDOP
				From	To	Begin	End					Start	End		
						1:55:45	2:00:45					GROUND STATIC		9	1.3
						2:20:50						S TURN		10	1.2
680TF2	51		65	80	39.9	49.2	2:31:40	2:34:20	N	3,700	140	CROSSING LINE		11	1.1
680TF1	81		1	145	0	89.7	2:39:05	3:01:30	E	3,800	140			10	1.1
	80		145	1	89.7	0	3:05:50	3:27:25	W	4,200	140			10	1.1
	79		1	143	0	88.5	3:32:20	3:53:20	E	3,800	140			10	1.1
	78		142	1	87.8	0	3:58:00	4:18:50	W	4,200	140			9	1.6
	77		1	141	0	87.2	4:23:05	4:43:45	E	3,700	140	LOST SYNC SIGNAL FOR TWO SECONDS AT 4:39:04		9	1.5
	77		141	131	87.2	81	4:47:55	4:49:50	W	4,200	135	CALIBRATION LINE		11	1.0
	76		141	1	87.2	0	4:56:50	5:17:55	W	4,200	140			11	1.0
	75		1	140	0	86.6	5:22:10	5:42:25	E	3,700	140			11	1.1
	74		140	1	86.6	0	5:46:30	6:07:15	W	4,200	140			11	1.1
	73		1	140	0	86.6	6:11:20	6:31:35	E	3,700	140	LIGHT FROST TOWARDS END		9	1.2
							6:33:20					S TURN		10	1.1
							6:53:15	6:58:15				GROUND STATIC		8	1.3

Trajectory and GPS Plots:

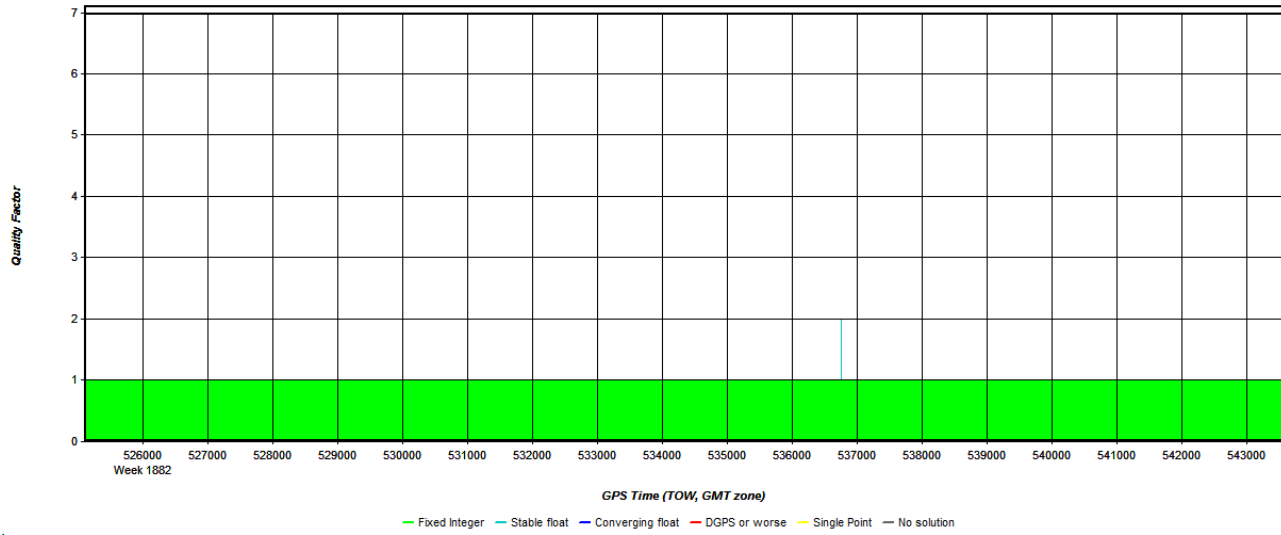


Estimated Accuracy

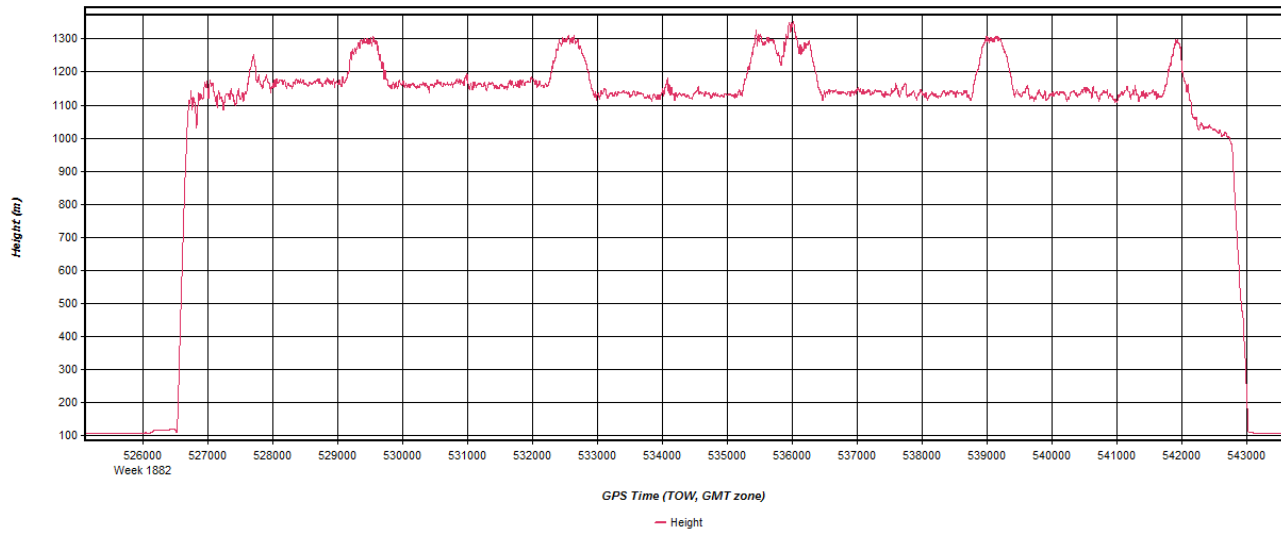




Quality Factor

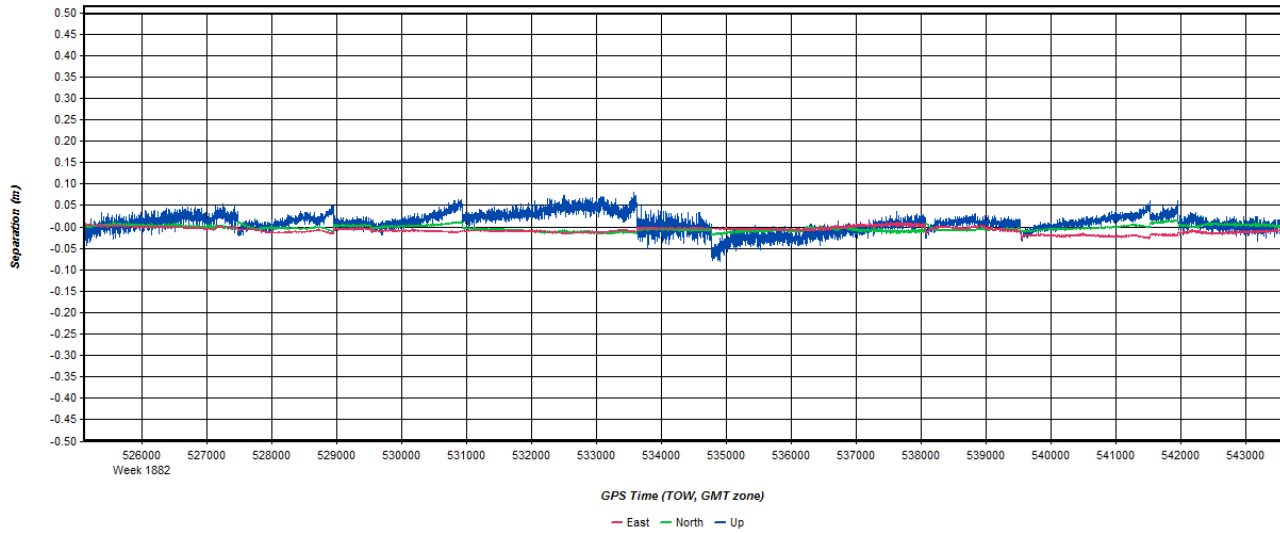


Height

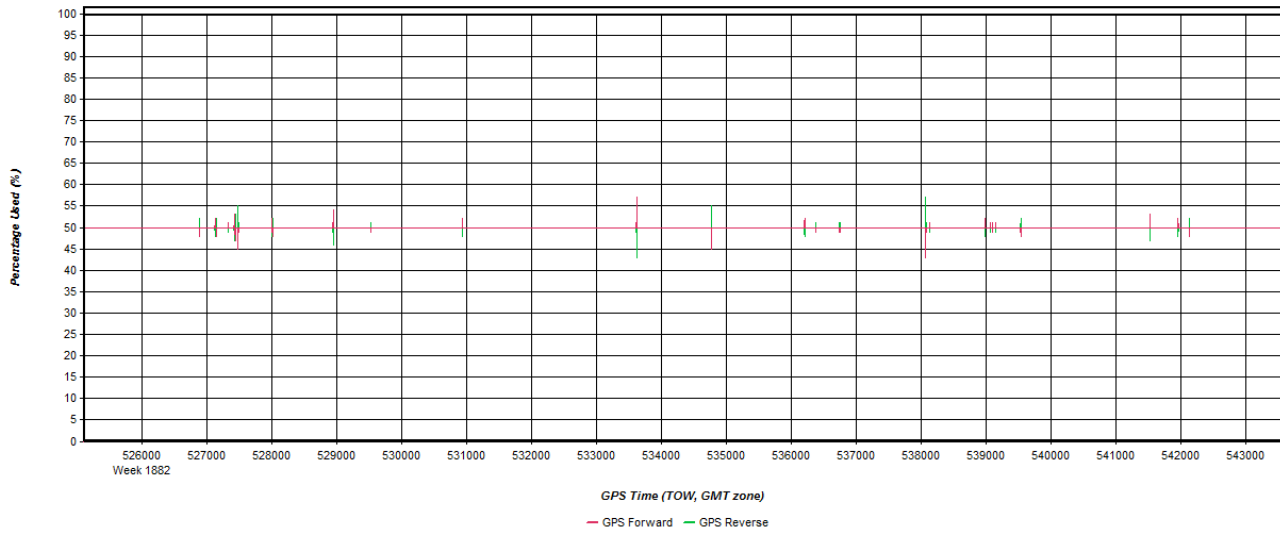




Combined Forward/Reverse Separation

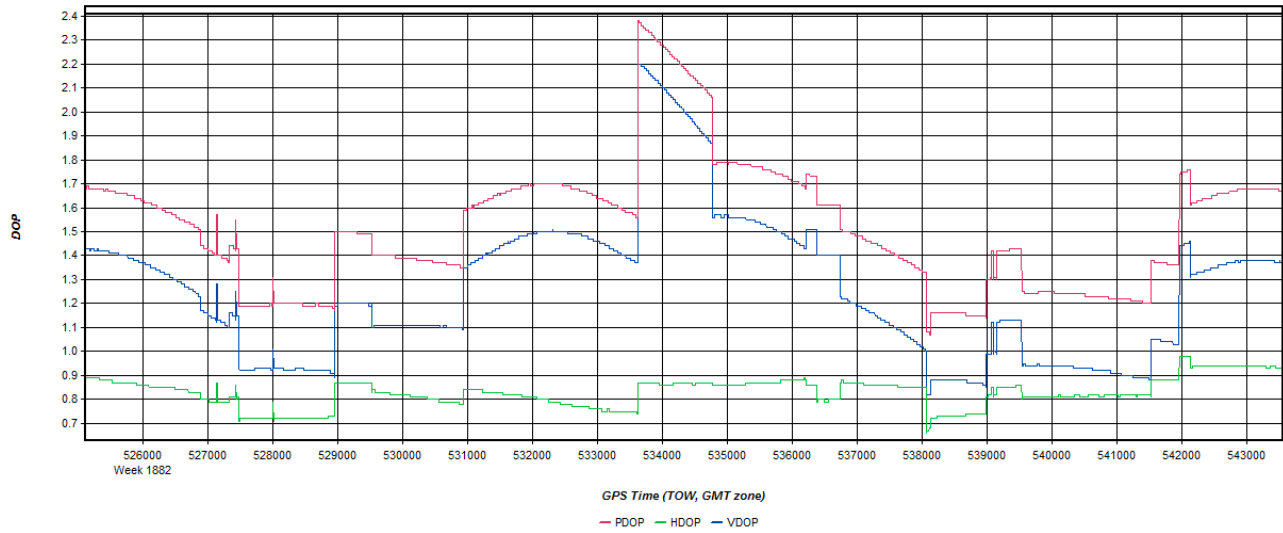


Combined Forward/Reverse Weighting

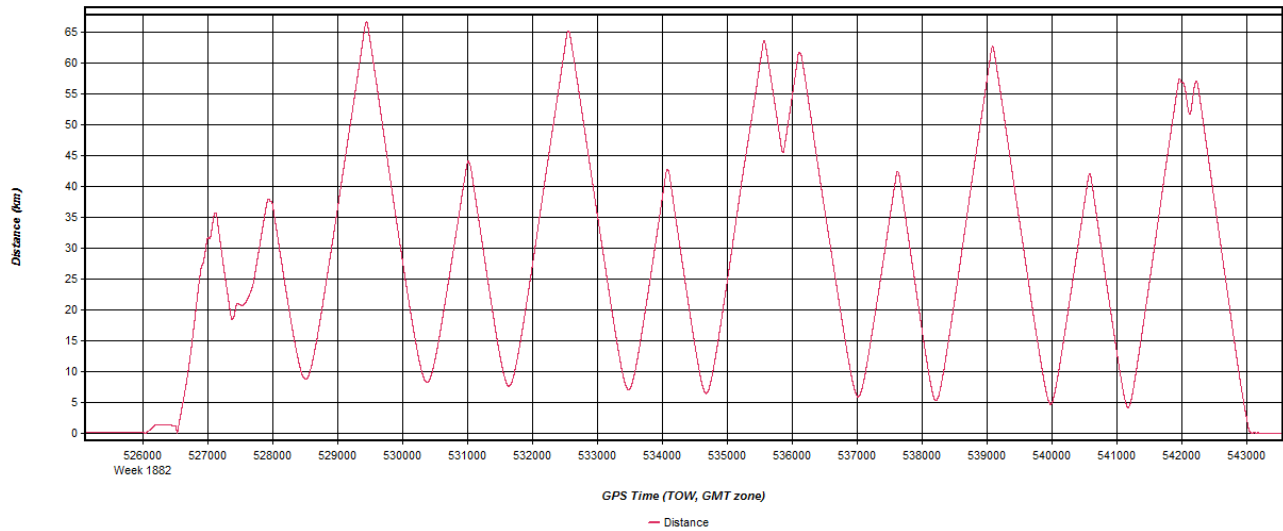




PDOP

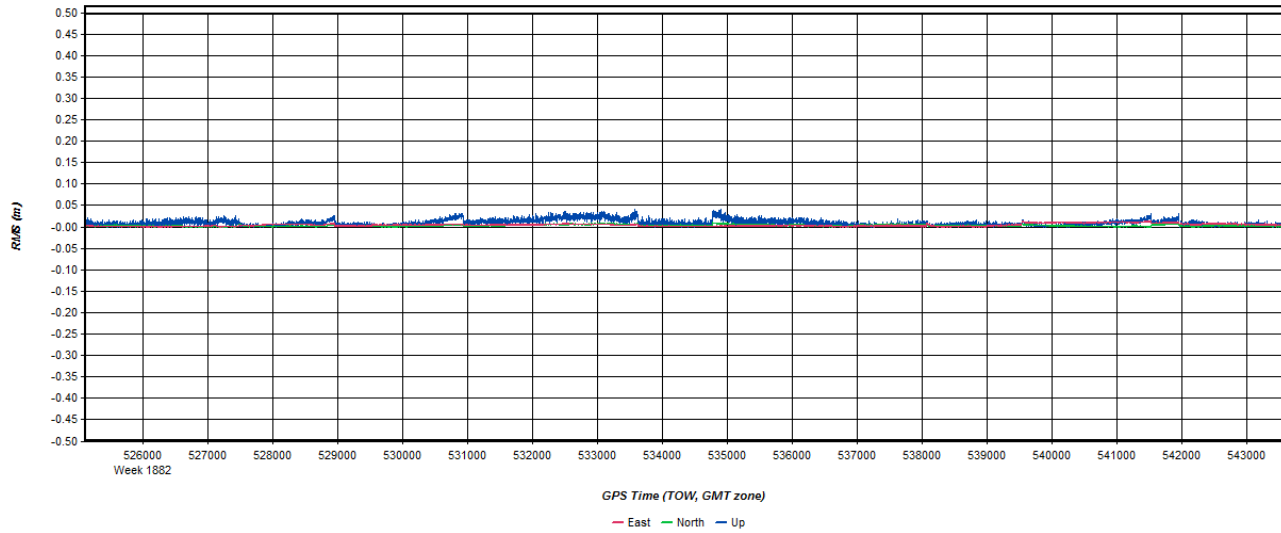


Distance from Base

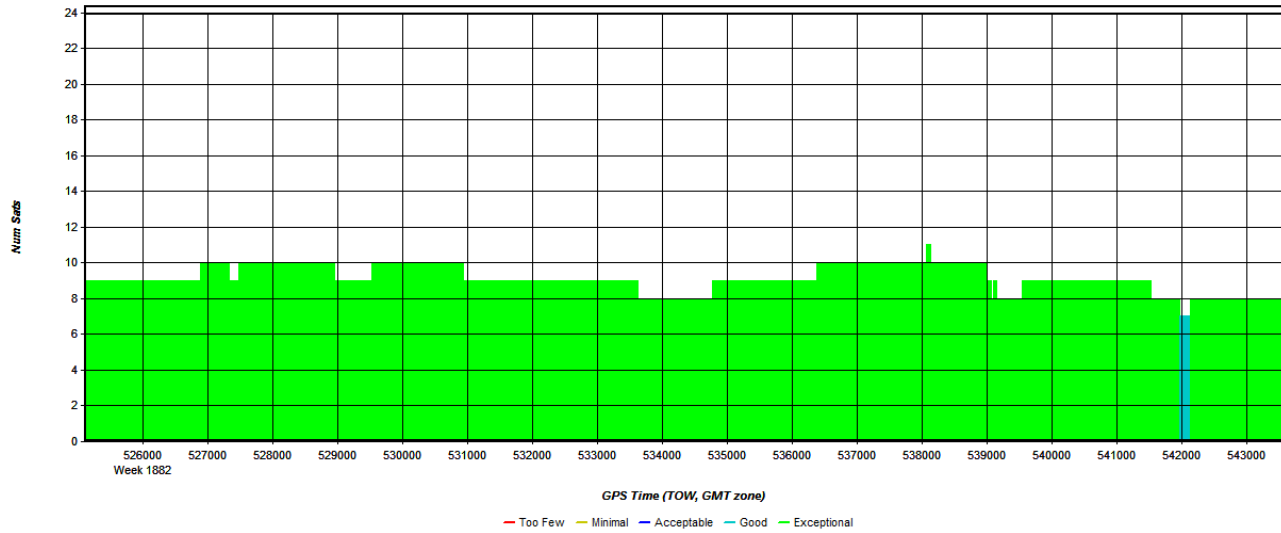




Combined RMS



SVs





Acquisition and Processing details ----- Collection 11 (February 6, 2016)

Log:



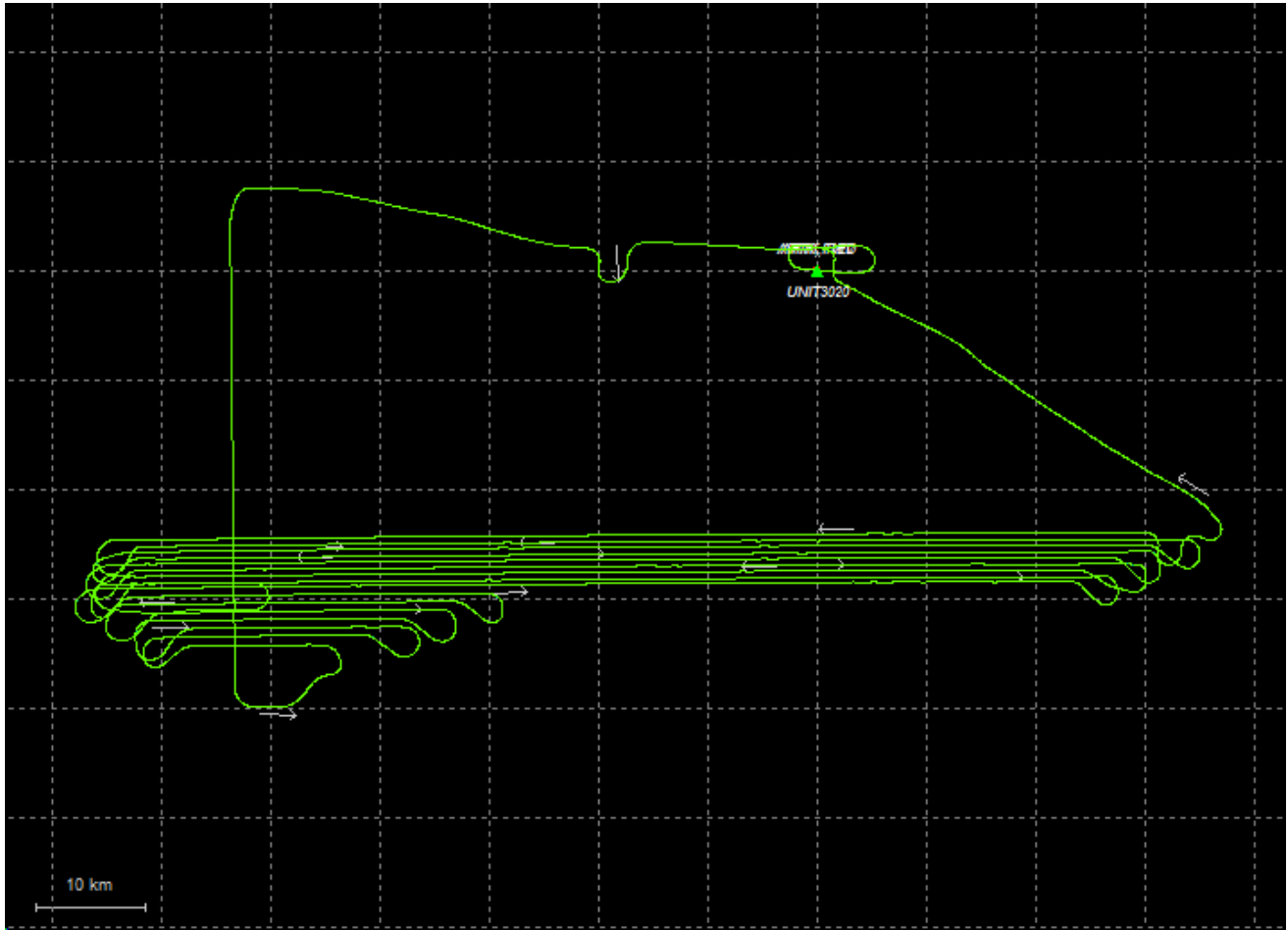
Fugro Geospatial, Inc.

15.2	Lift Begin			Lift End			Fit Duration	Fit Hrs	Hobbs Hrs	Activity
	Airport	Chocks	Hobbs	Airport	Chocks	Hobbs				
1	H35	16:12	9826.6	H35	21:45	9832.2	5:33	5.50	5.6	0900-Production
2										
3										

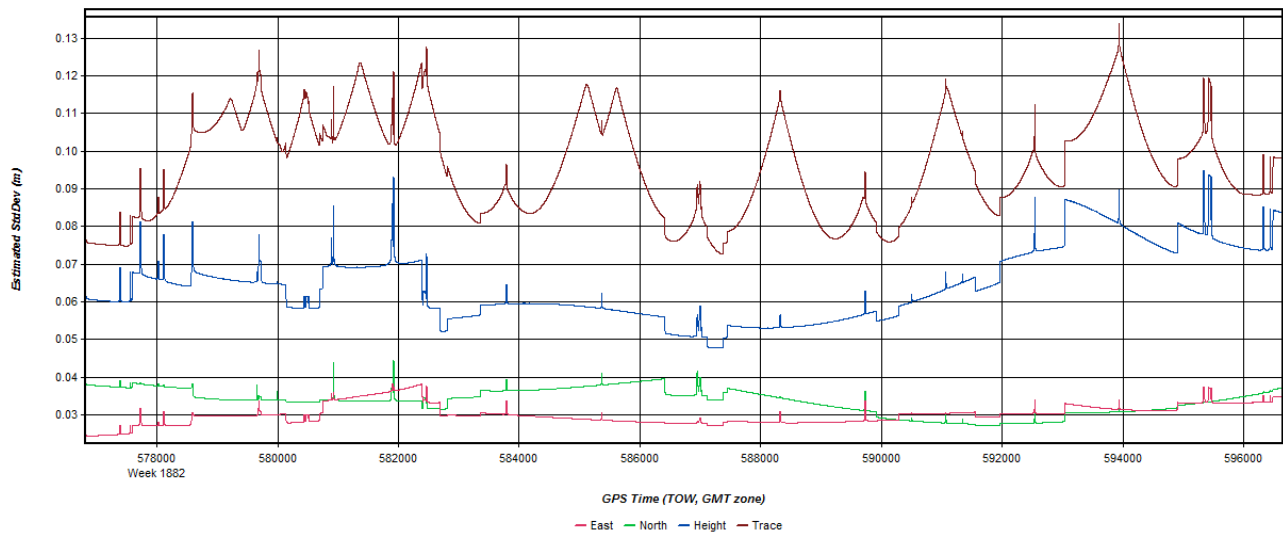
Q680i
Flight Log

FGI Job #	Project Name				Operator		Unit	IMU	Ground Temp °C		Mn Range'	Data Logger Drives			
22.15005200	FEMA Dardanelle Reserv				Leonid Eremeev		165	-	5.0	13.0	2100	DR680-12			
Flight Date	GPS Day	Lift	System	Pilot		Sun*	Solar Times (UTC)		Pulse Rate	Flying Temp °C		Max Range'	Download Drive		
6-Feb-16	16-037	11	R680i	Kris Farrell		-	-		240000	-1.0 0.0		4052			
Mission ID (yyymmdd_Sen_Job_Lift)	Aircraft	Airport ID	FMS	UTC	AMT (ft)	Speed	FOV	Scan Rate (Hz)	MTA	km/WPT	AltM Setting	Humidity @ Alt	Shipping Track		
160206_165_15005200_11	N62912	H35	CCNS 7	-6	3400	140	-	100	2	0.623	30.42	30.29	808360526905		
Base 1 ID	Location	Rec ID	Ant ID	ARP (m)	Start Time (UTC)		Stop Time (UTC)		GPS Filename		Operator	Data			
FG201601	H35	GR3Unit3	GR3Unit3	1.8	06-Feb-16 14:55						Leonid Eremeev	With AB			
Area	Flight #	Client	Wpt	Distance		UTC		Dir	Altitude (GPS)	Speed (knots)	Scan Rate	Comments and Conditions	SVs	PDOP	
				From	To	Begin	End								Start
												GPS ground static	19	1.1	
												S-turn for IMU alignment	19	1.1	
680FT2	50		56	1	34.3	0	16:44:00	16:52:00	S	3,780	143	?	X-tie, full	18	1.2
680FT1	1		10	1	5.6	0	16:57:00	16:59:00	W	3,970	138	?		19	1.1
	2		1	21	0	12.5	17:02:00	17:05:00	E	3,890	140	?		20	1.0
	3		21	1	12.5	0	17:08:00	17:12:00	W	3,890	145	?		20	1.0
	4		1	26	0	15.6	17:15:00	17:19:00	E	3,850	136	?		21	1.0
	5		26	1	15.6	0	17:23:00	17:27:00	W	3,855	140	?		21	1.0
	6		1	39	0	23.7	17:30:00	17:36:00	E	3,815	140	?		22	1.0
	7		39	1	23.7	0	17:39:00	17:45:00	W	3,875	143	?		22	1.0
	24		1	131	0	81	17:49:00	18:08:00	E	3,850	136	?		19	1.1
	25		131	1	81	0	18:10:00	18:30:00	W	4,120	141	?		18	1.1
	25		1	15	0	8.7	18:33:00	18:35:00	E	3,850	138	?	calibration line	17	1.2
	26		1	131	0	81	18:41:00	19:00:00	E	3,770	144	?		17	1.2
	27		136	1	84.1	0	19:04:00	19:23:00	W	3,760	138	?		18	1.0
	28		1	136	0	84.1	19:26:00	19:46:00	E	3,700	140	?		17	1.2
	29		136	1	84.1	0	19:49:00	20:09:00	W	3,600	137	?		17	1.1
	30		1	142	0	87.8	20:12:00	20:33:00	E	3,660	131	?		17	1.1
	31		142	1	87.8	0	20:36:00	20:57:00	W	3,650	137	?		16	1.1
	32		1	142	0	87.8	21:00:00	21:20:00	E	3,780	142	?		15	1.2
							21:20:00	21:23:00					S-turn for IMU alignment	14	1.1
							21:38:00	21:43:00					GPS ground static	14	1.2

Trajectory and GPS Plots:

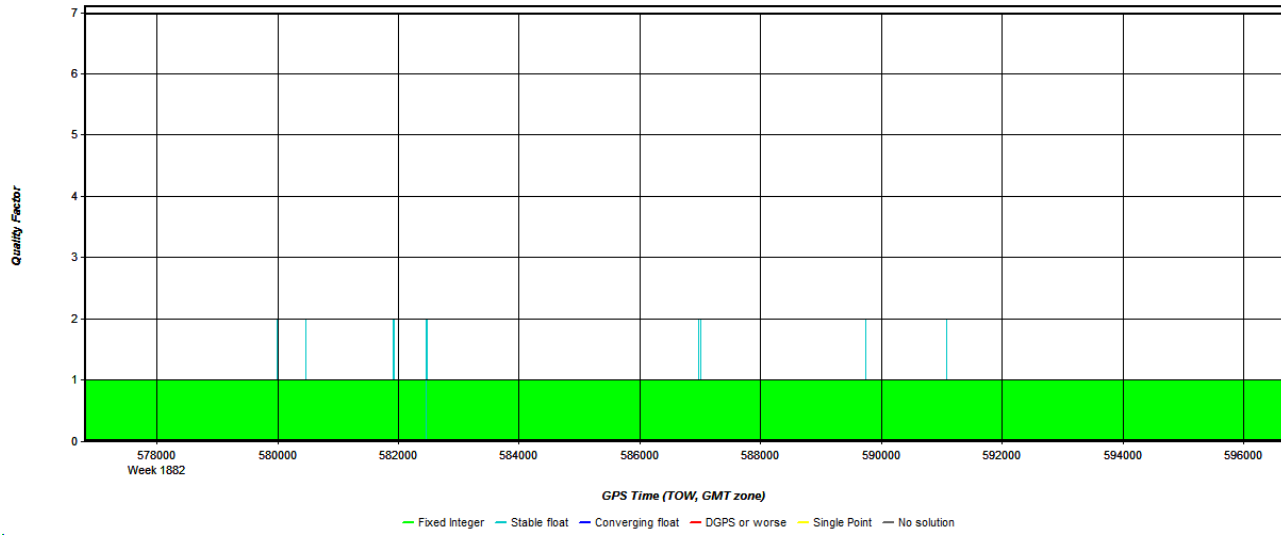


Estimated Accuracy

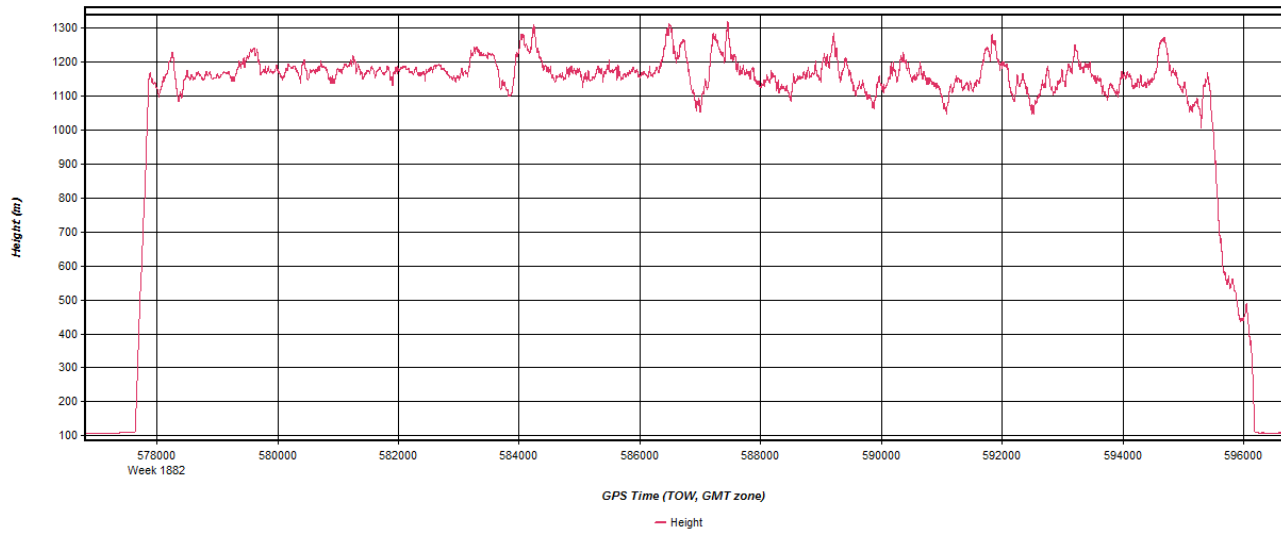




Quality Factor

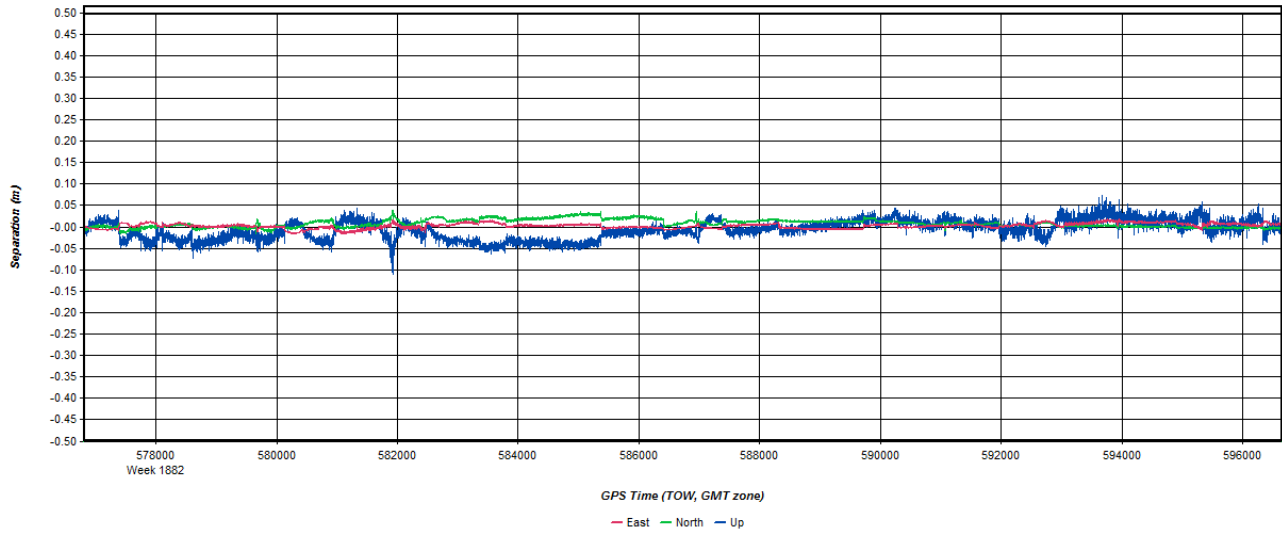


Height





Combined Forward/Reverse Separation

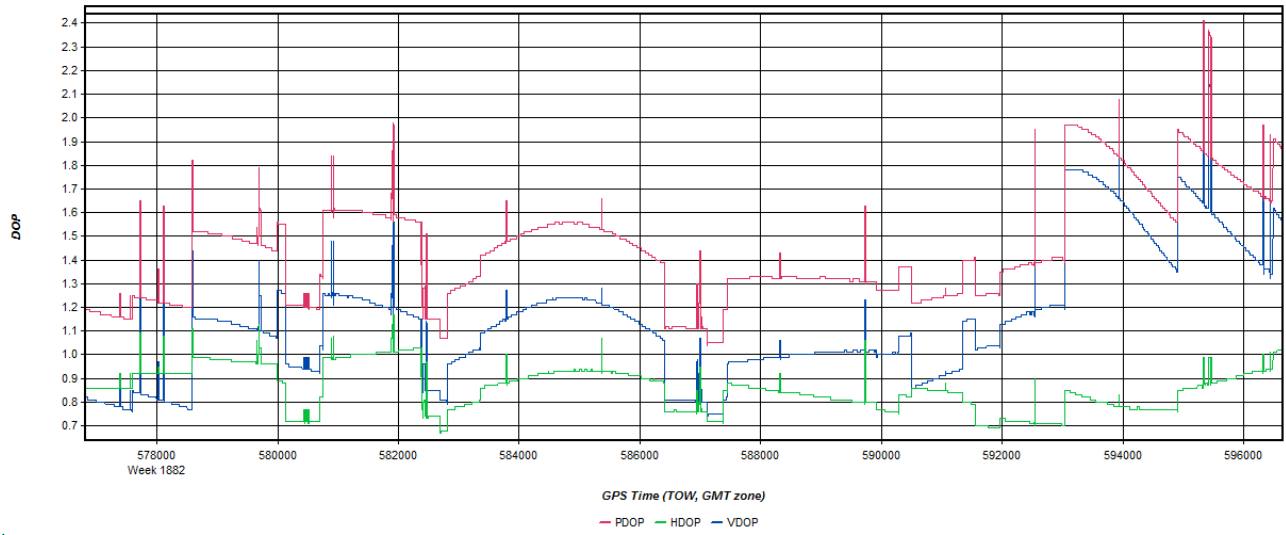


Combined Forward/Reverse Weighting

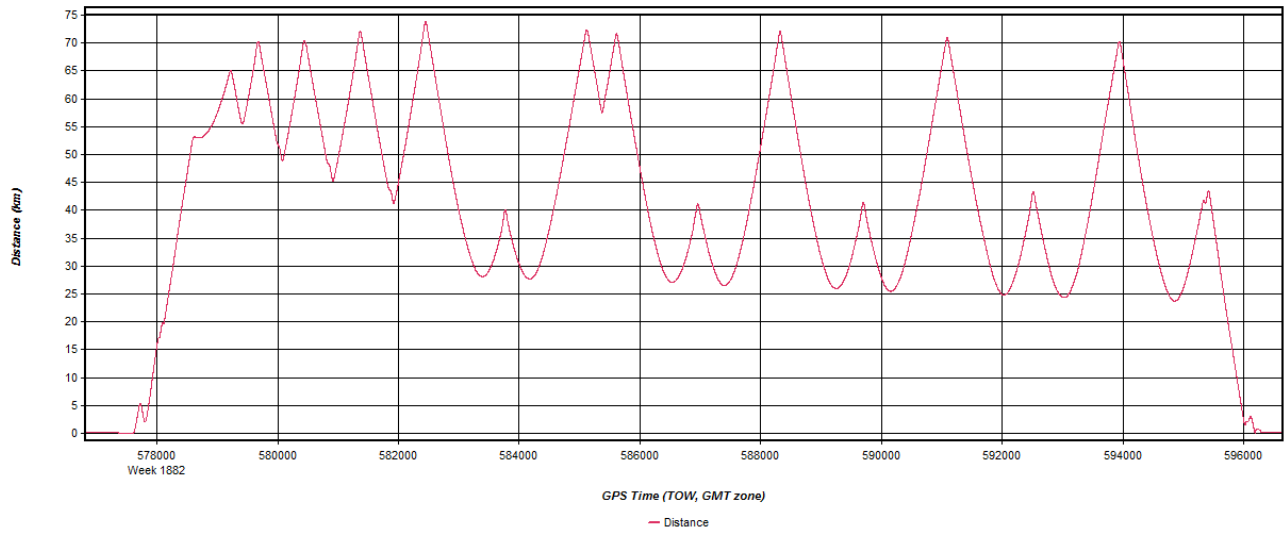




PDOP

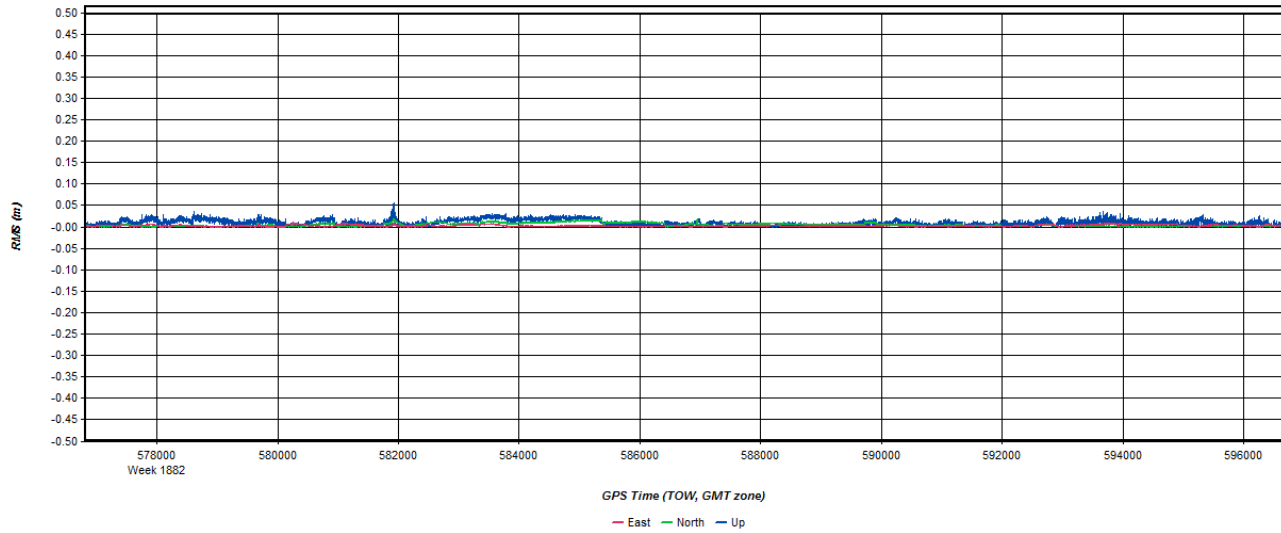


Distance from Base

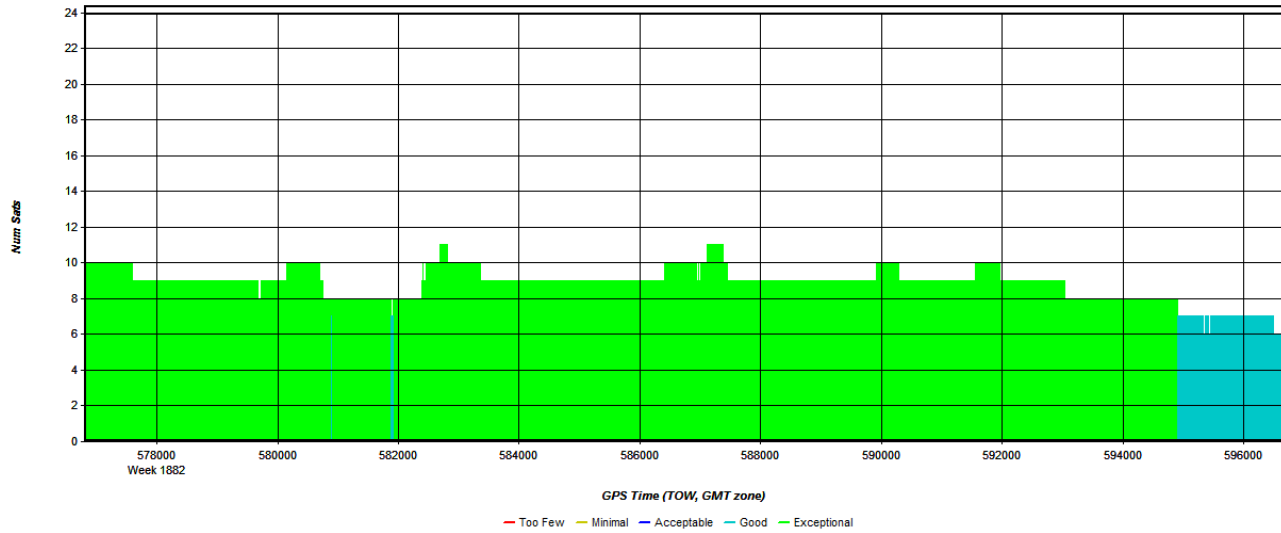




Combined RMS



SVs





Acquisition and Processing details ----- Collection 12 (February 6, 2016)

Log:



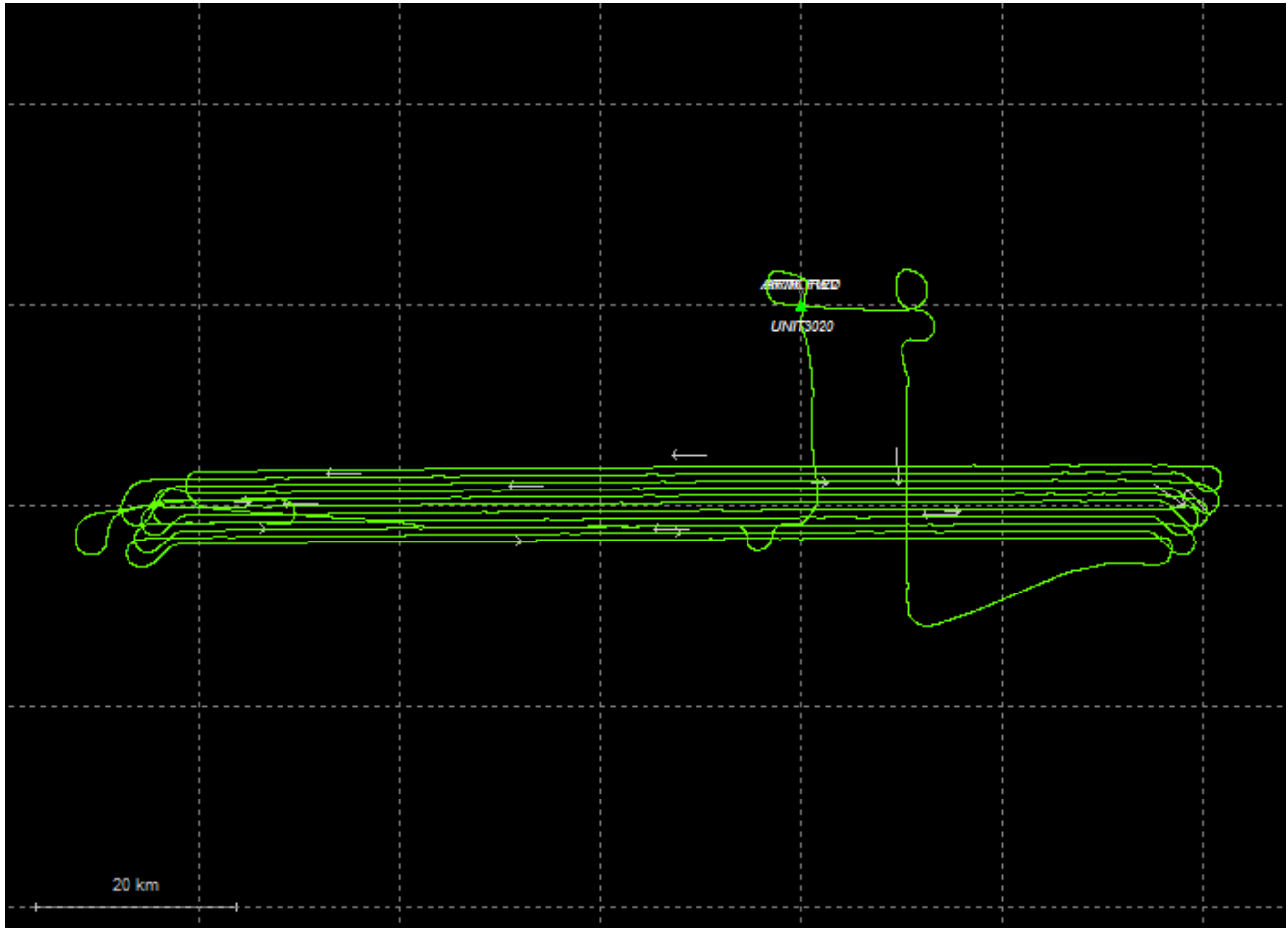
Fugro Geospatial, Inc.

15.2	Lift Begin			Lift End			Fit Duration	Fit Hrs	Hobbs Hrs	Activity
	Airport	Chocks	Hobbs	Airport	Chocks	Hobbs				
1	H35	22:19	9832.2	H35	4:18	9838.1	5:59	6.00	5.9	0900-Production
2										
3										

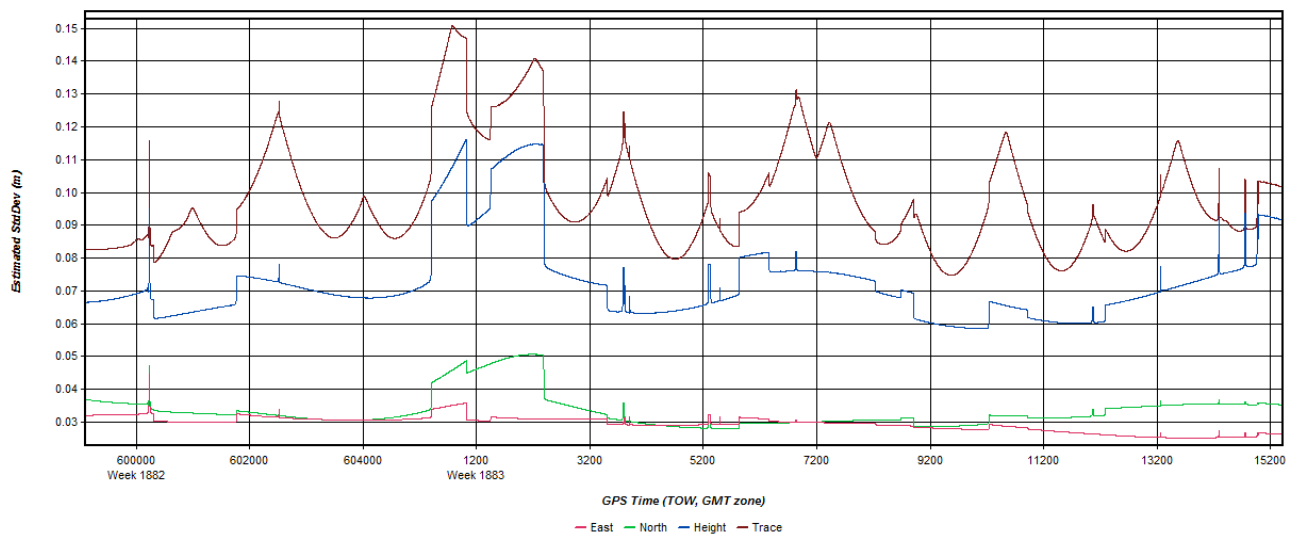
Q680i
Flight Log

FGI Job #	Project Name				Operator		Unit	IMU	Ground Temp °C			Mn Range'	Data Logger Drives		
22.15005200	FEMA Dardanelle Reserv				Leonid Eremeev		165	-	13.0	-3.0	2100	DR680-11			
Flight Date	GPS Day	Lift	System	Pilot		Sun*	Solar Times (UTC)		Pulse Rate	Flying Temp °C		Max Range'	Download Drive		
6-Feb-16	16-037	12	R680i	Kris Farrell		-	-		240000	-1.0	0.0	4052			
Mission ID (yyymmdd_Sen_Job_Lift)	Aircraft	Airport ID	FMS	UTC	AMT (ft)	Speed	FOV	Scan Rate (Hz)	MTA	km/WPT	Altm Setting	Humidity @ Alt	Shipping Track		
160206_165_15005200_12	N62912	H35	CCNS 7	-6	3400	140	-	100	2	0.623	30.29	30.30	808360526905		
Base 1 ID	Location		Rec ID	Ant ID	ARP (m)	Start Time (UTC)		Stop Time (UTC)		GPS Filename		Operator	Data		
FG201601	H35		GR3Unit3	GR3Unit3	1.8	06-Feb-16 14:55						Leonid Eremeev	With AB		
Area	Flight #	Client	Wpt	Distance		UTC		Dir	Altitude (GPS)	Speed (knots)	Scan Rate	Comments and Conditions		SVs	PDOP
				From	To	Begin	End					Start	End		
												GPS ground static		15	1.3
												S-turn for IMU alignment		17	1.1
680FT2	52		30	5	18.1	2.5	22:45:00	22:49:00	S	3,670	138	?	X-tie, partial	17	1.1
680FT1	33		147	1	91	0	22:57:00	23:19:00	E	3,480	133	?		17	1.2
	34		1	148	0	91.6	23:23:00	23:45:00	W	3,780	142	?		17	1.1
	35		149	1	92.2	0	23:48:00	0:10:00	E	3,560	130	?	possible 2 mile data gap at waypoint 73 - "lost sync signal"	16	1.3
	36		1	149	0	92.2	0:14:00	0:35:00	W	3,680	145	?		18	1.1
	37		149	1	92.2	0	0:38:00	1:01:00	E	3,760	123	?		17	1.2
	38		1	151	0	93.4	1:04:00	1:25:00	W	3,680	144	?		18	1.1
	39		152	1	94.1	0	1:29:00	1:51:00	E	3,650	137	?		18	1.1
	39		1	10	0	5.6	1:57:00	1:59:00	W	3,570	149	?	calibration line	16	1.4
	40		1	152	0	94.1	2:04:00	2:27:00	E	3,660	146	?		16	1.4
	41		152	1	94.1	0	2:30:00	2:53:00	W	3,680	142	?		18	1.1
	42		1	152	0	94.1	2:57:00	3:19:00	E	3,670	136	?		18	1.0
	43		151	1	94.1	0	3:23:00	3:45:00	W	3,680	133	?		15	1.4
	35		60	85	39.9	52.3	3:53:00	3:57:00	E	3,820	143	?	filling in the gap, see above	15	1.2
							3:57:00	4:00:00					S-turn for IMU alignment	14	1.5
							4:11:00	4:16:00					GPS ground static	14	1.5

Trajectory and GPS Plots:

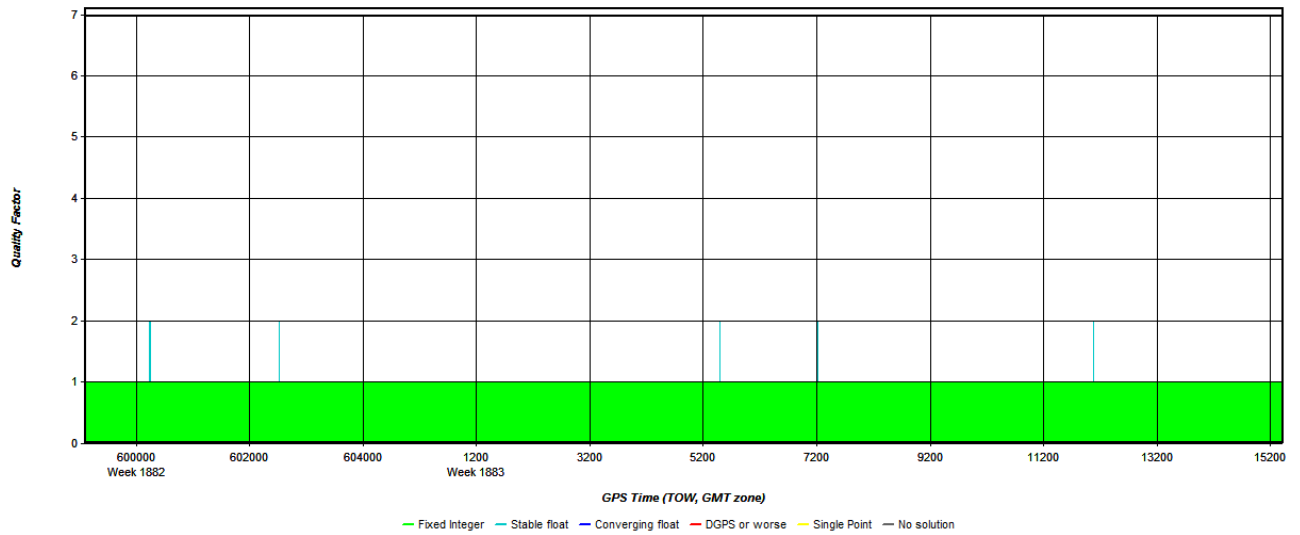


Estimated Accuracy

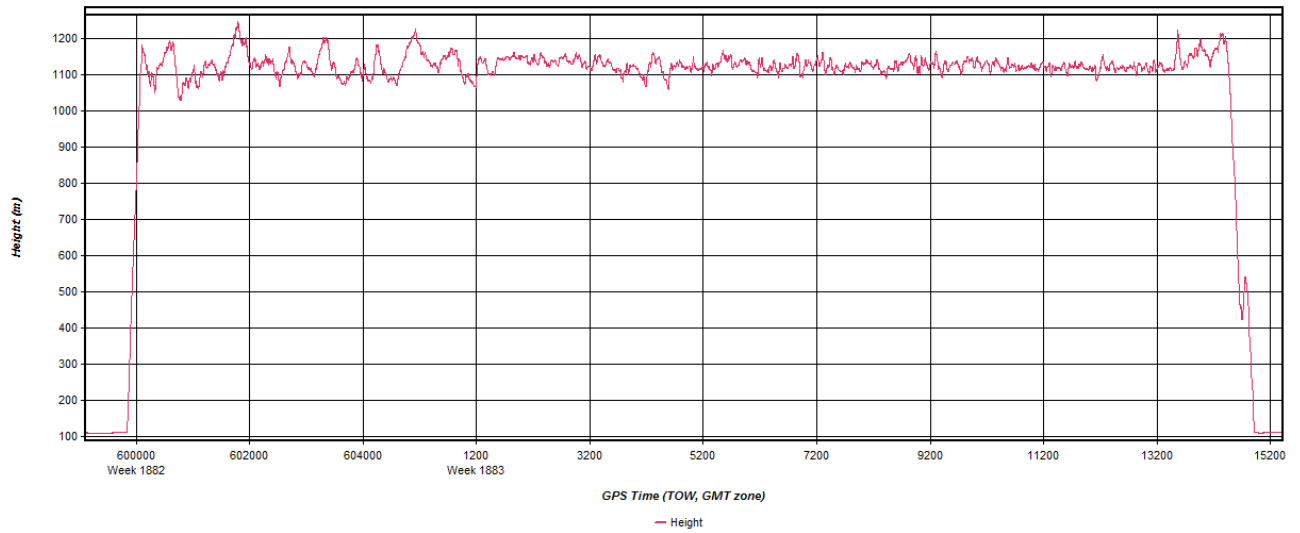




Quality Factor

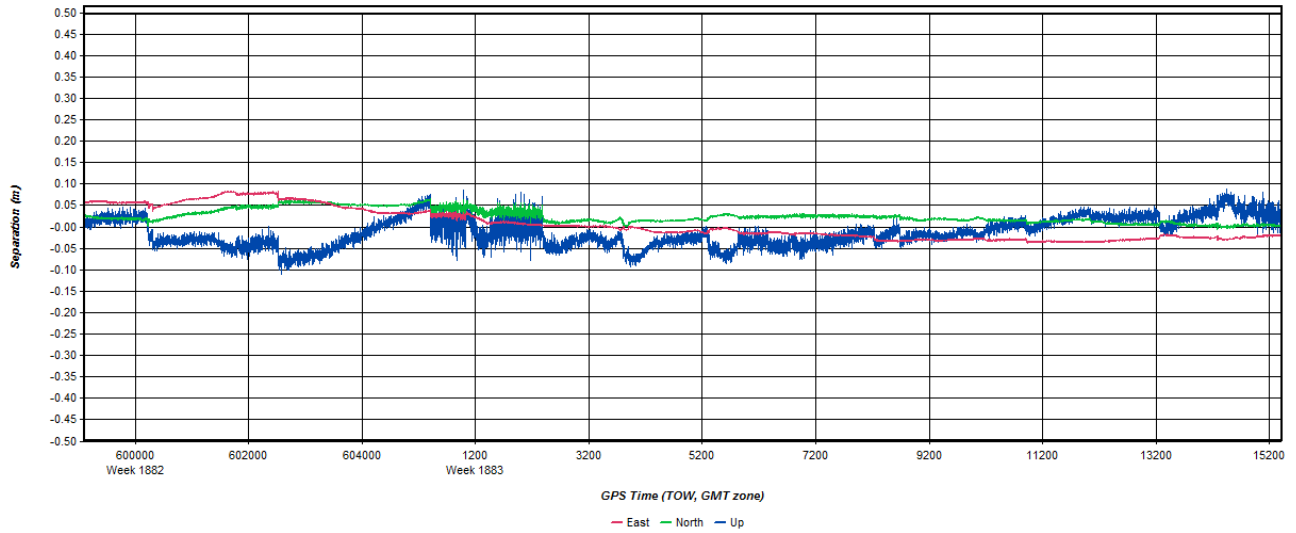


Height

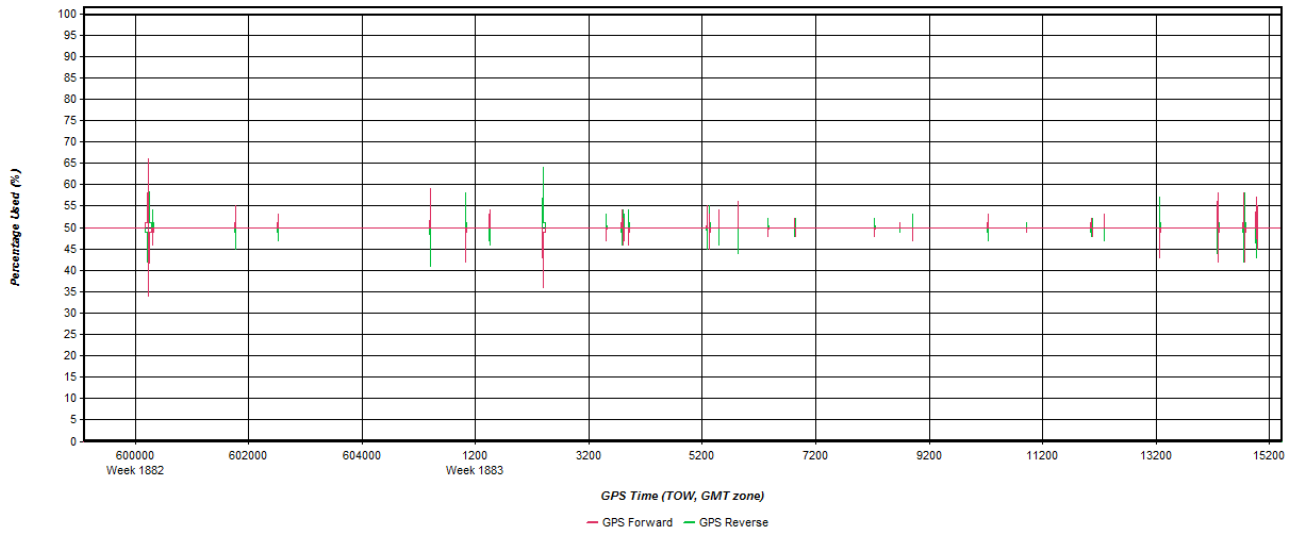




Combined Forward/Reverse Separation

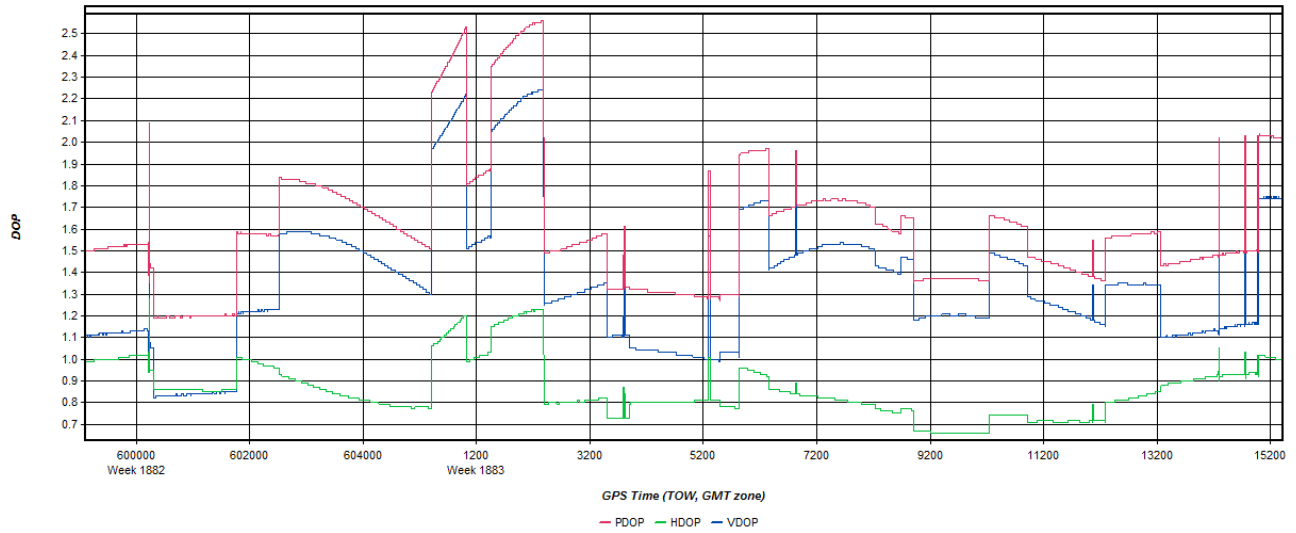


Combined Forward/Reverse Weighting

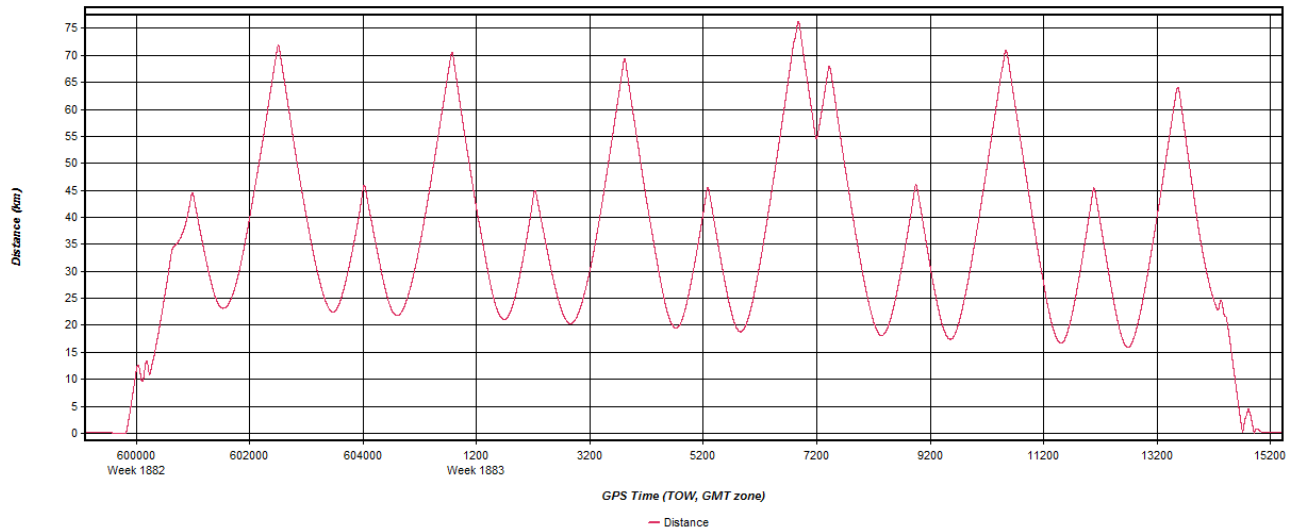




PDOP

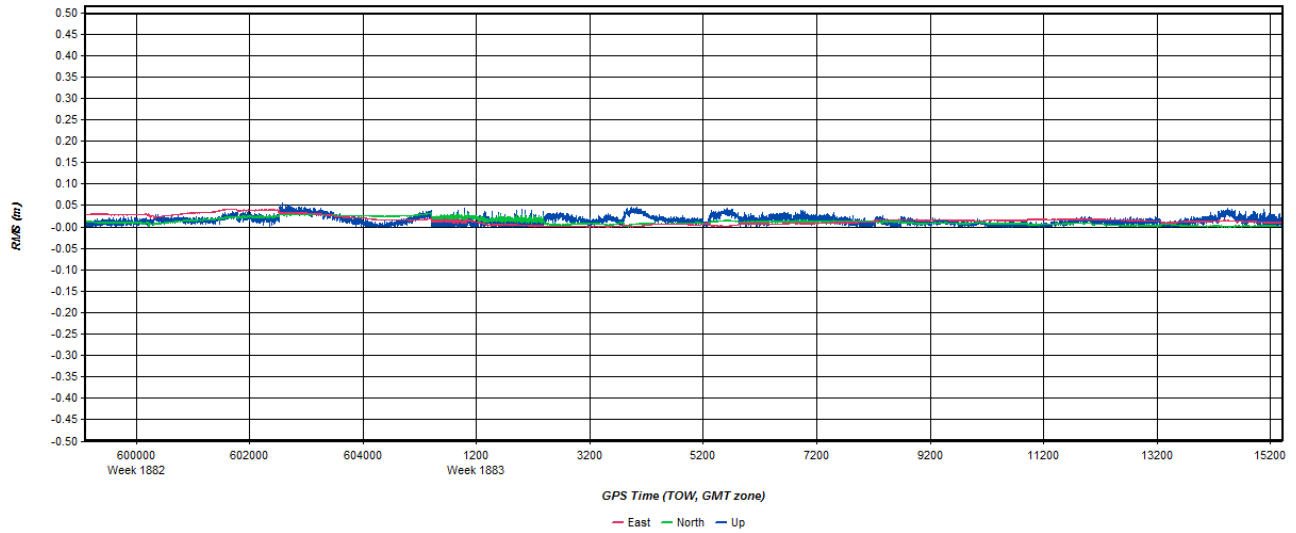


Distance from Base

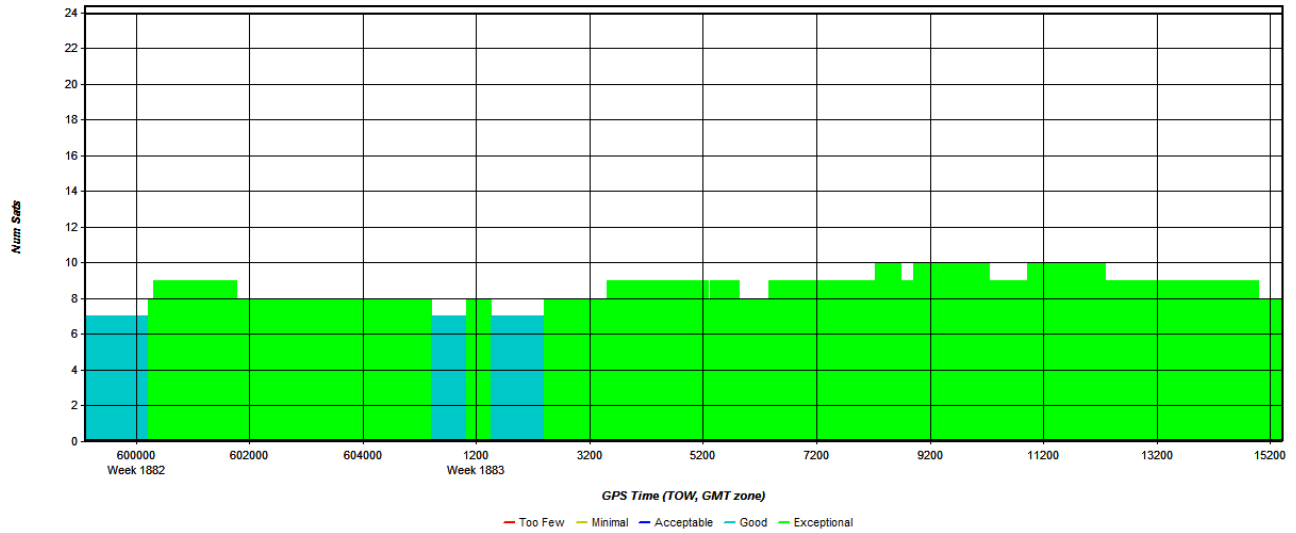




Combined RMS



SVs





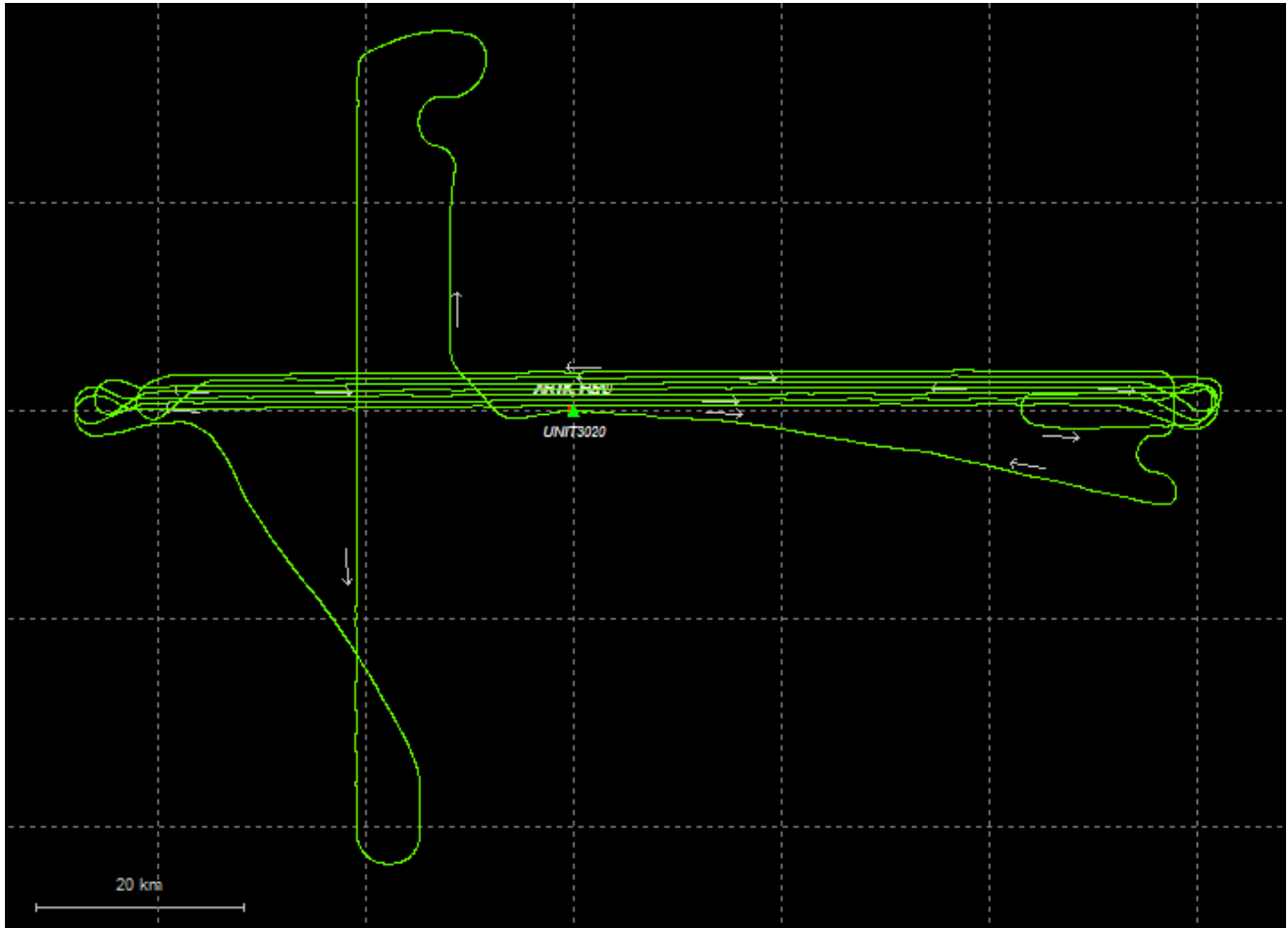
Acquisition and Processing details ----- Collection 13 (February 6, 2016)

Log:

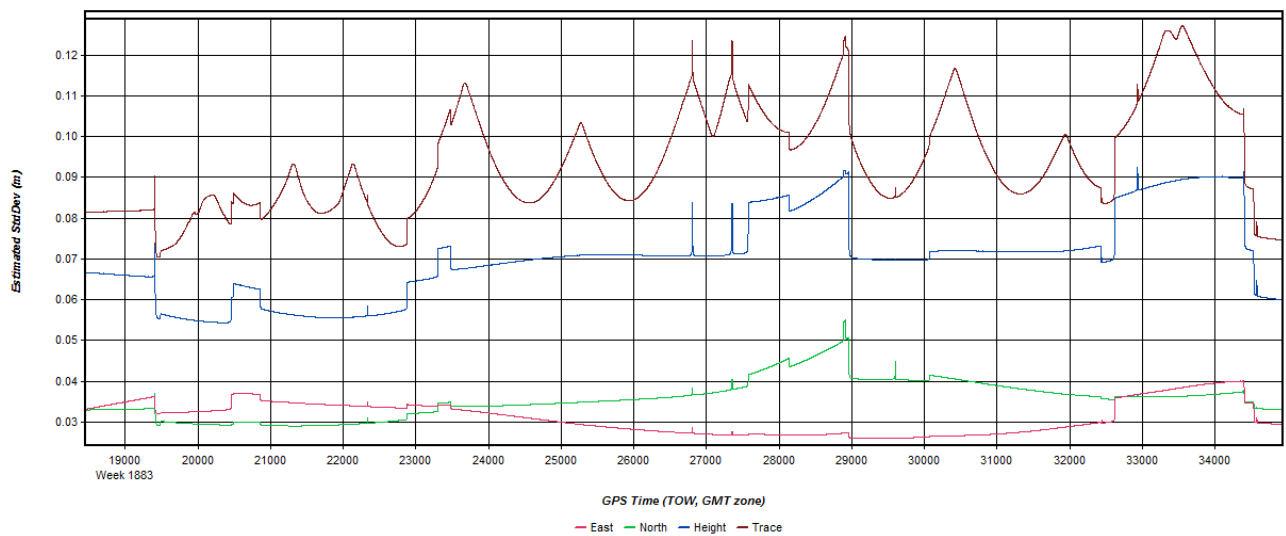
FUGRO		Fugro Geospatial, Inc.										Q680i Flight Log	
15.2		Lift Begin			Lift End			Flt	Flt	Hobbs	Activity		
		Airport	Chocks	Hobbs	Airport	Chocks	Hobbs	Duration	Hrs	Hrs			
1		H35	5:02	9838.2	H35	9:43	9842.9	4:41	4.75	4.7	0900-Production		
2													
3													

FGL Job # 22.15005200		Project Name FEMA Dardanelle Reserv			Operator Jacob Amundson		Unit 165	IMU -			Ground Temp °C -4.0 -4.0	Min Range' 2100	Data Logger Drives DR680-10		
Flight Date 6-Feb-16		GPS Day 16-037	Lift 13	System R680I	Pilot Jim Cross		Sun° -	Solar Times (UTC) -	Pulse Rate 240000		Flying Temp °C 2.0 -2.0	Max Range' 4052	Download Drive EP1TB#58		
Mission ID (yyymmdd_Sen_Job_Lift) 160206_165_15005200_13		Aircraft N62912	Airport ID H35	FMS CCNS 7	UTC -6	AMT (ft) 3400	Speed 140	FOV -	Scan Rate (Hz) 100	MTA 2	km/WPT 0.623	Altitude Setting 30.27 30.24	Humidity @ Alt -	Shipping Track 8083 6052 6905	
Base 1 ID FG201601	Location H35		Rec ID GR3Unit3	Ant ID GR3Unit3	ARP (m) 1.8	Start Time (UTC) 06-Feb-16 14:55		Stop Time (UTC) 07-Feb-16 09:50		GPS Filename UNIT30206o.tps		Operator Jacob Amundson	Data With AB		
Area	Flight #	Client	Wpt	Distance		UTC		Dir	Altitude (GPS)	Speed (knots)	Scan Rate	Comments and Conditions		SVs	PDOP
				From	To	Begin	End					Start	End		
						5:10:55	5:15:55					GROUND STATIC		10	1.3
						5:30:20						S TURN		11	1.0
680TF2	51		95	1	58.6	0	5:39:00	5:54:00	S	4,400	140	CROSSING LINE		10	1.0
680TF1	66		1	142	0	87.8	6:10:30	6:31:15	E	3,720	140			9	1.2
	67		147	1	91	0	6:36:45	6:58:45	W	4,030	140			8	1.2
	68		1	147	0	91	7:02:50	7:24:00	E	3,600	140			8	1.1
	68		147	137	91	84.7	7:28:35	7:30:30	W	4,300	140	CALIBRATION LINE		8	1.2
	69		147	1	91	0	7:37:30	8:00:00	W	4,400	140			8	1.2
	70		1	138	0	85.4	8:04:25	8:24:25	E	3,600	140			9	1.3
	71		139	1	86	0	8:28:55	8:49:45	W	4,400	140			8	1.4
	72		1	139	0	86	8:53:55	9:14:00	E	3,600	140	LIGHT FROST		9	1.1
							9:15:55					S TURN		9	1.1
							9:36:20	9:41:20				GROUND STATIC		10	1.0

Trajectory and GPS Plots:

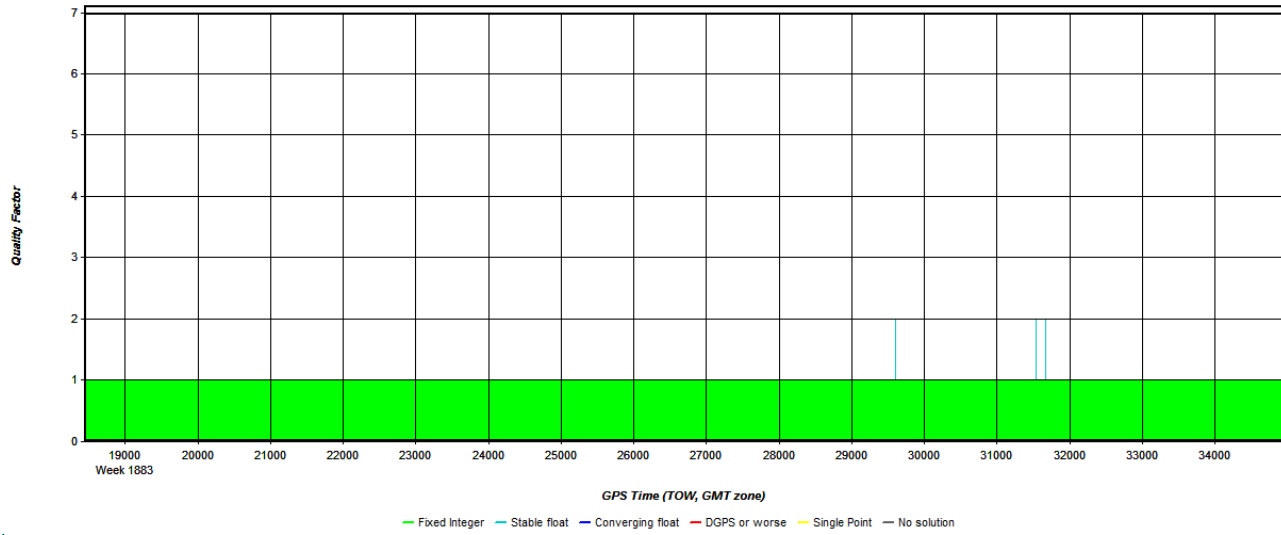


Estimated Accuracy

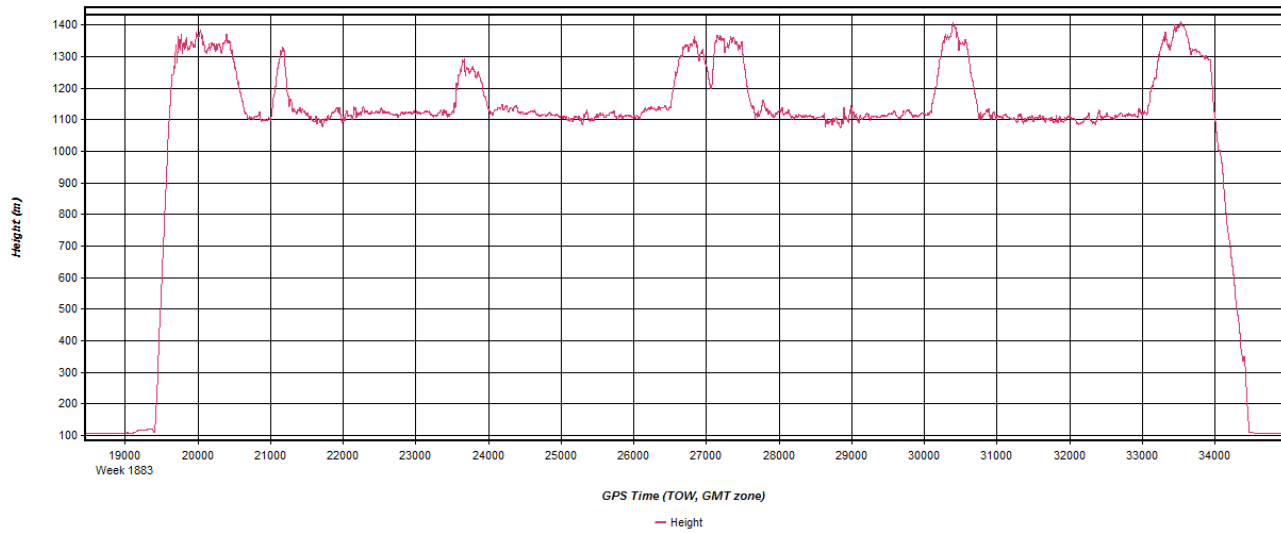




Quality Factor

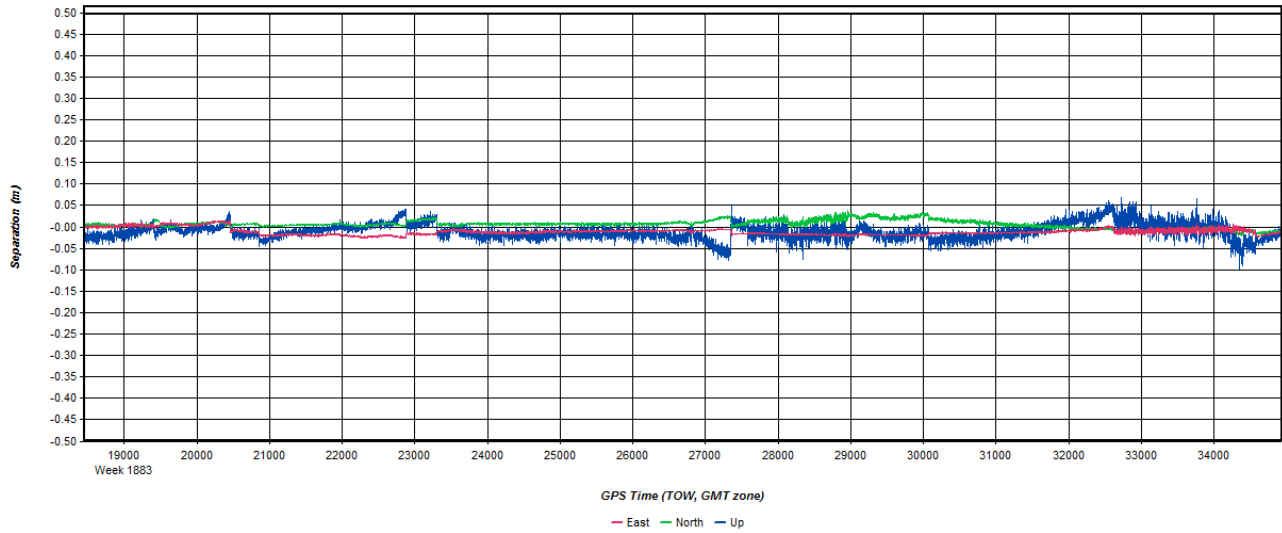


Height

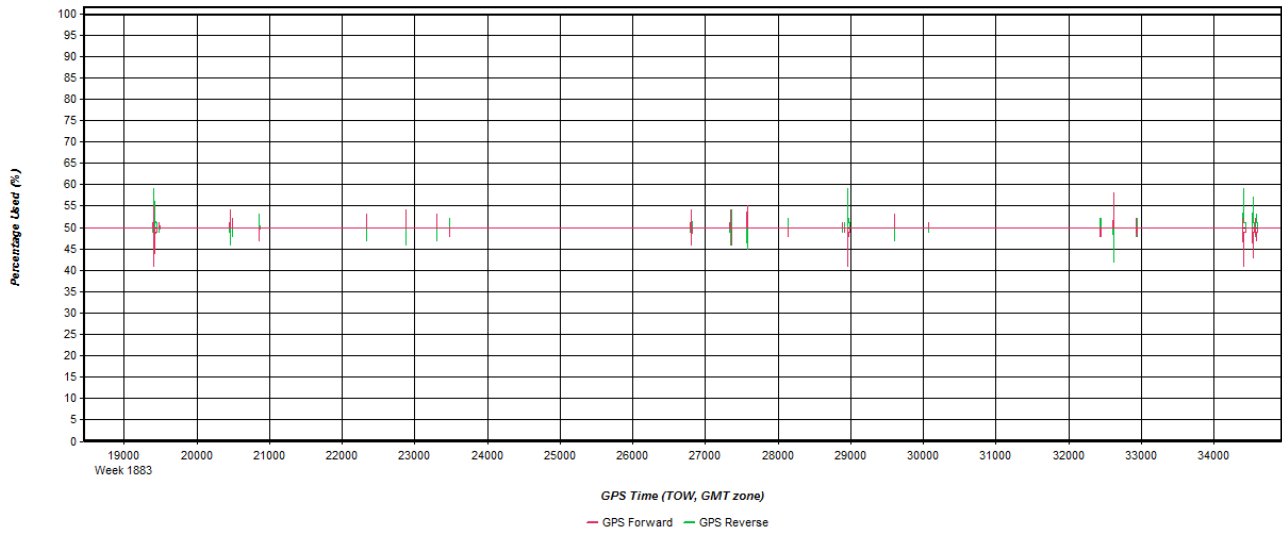




Combined Forward/Reverse Separation

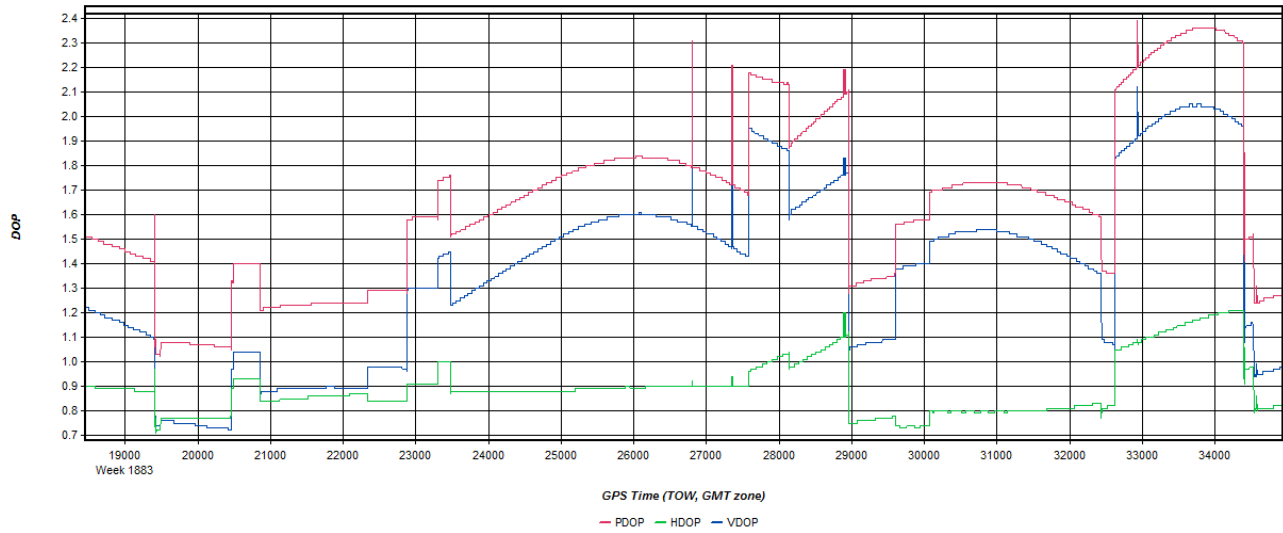


Combined Forward/Reverse Weighting

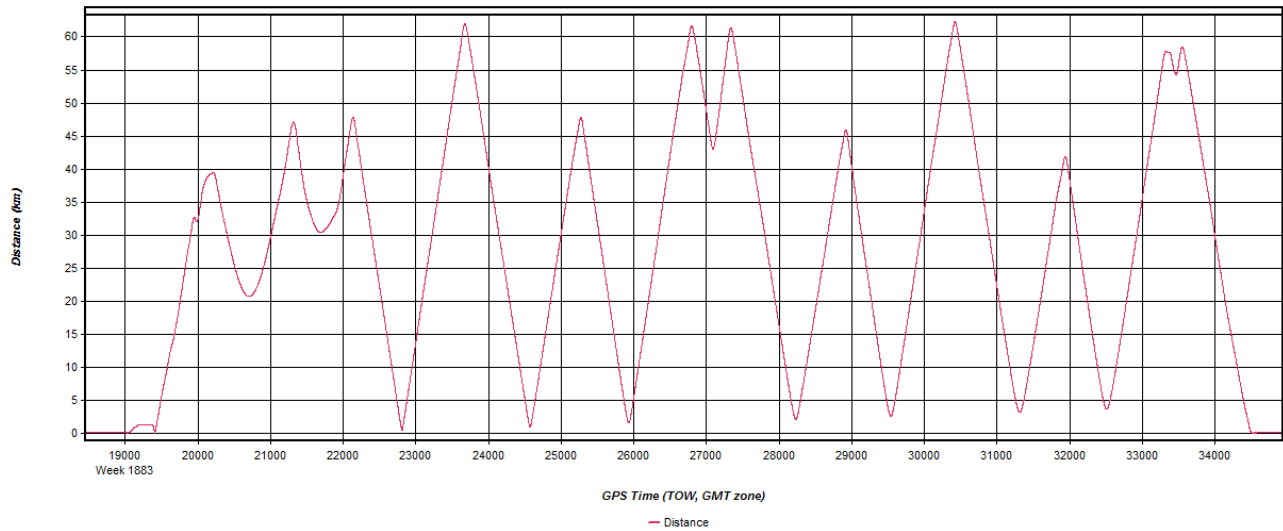




PDOP

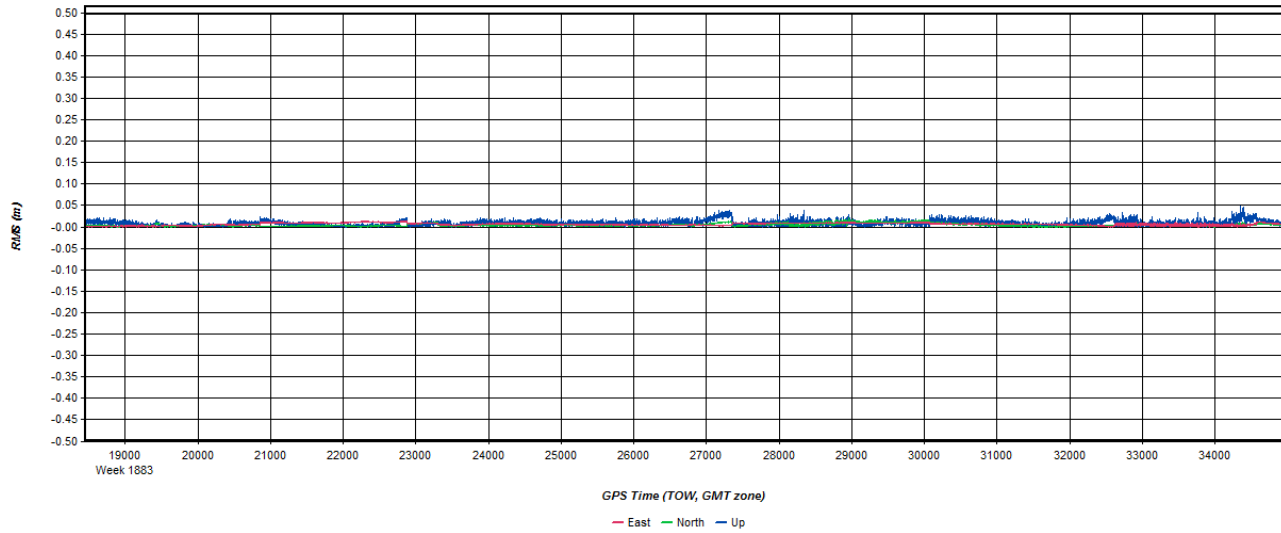


Distance from Base

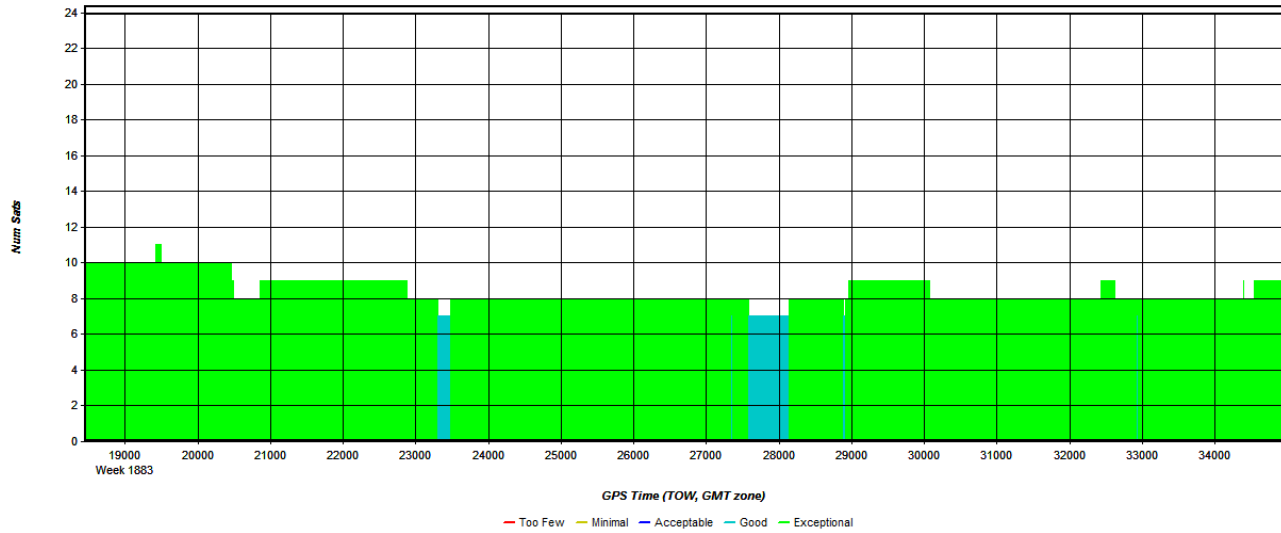




Combined RMS



SVs





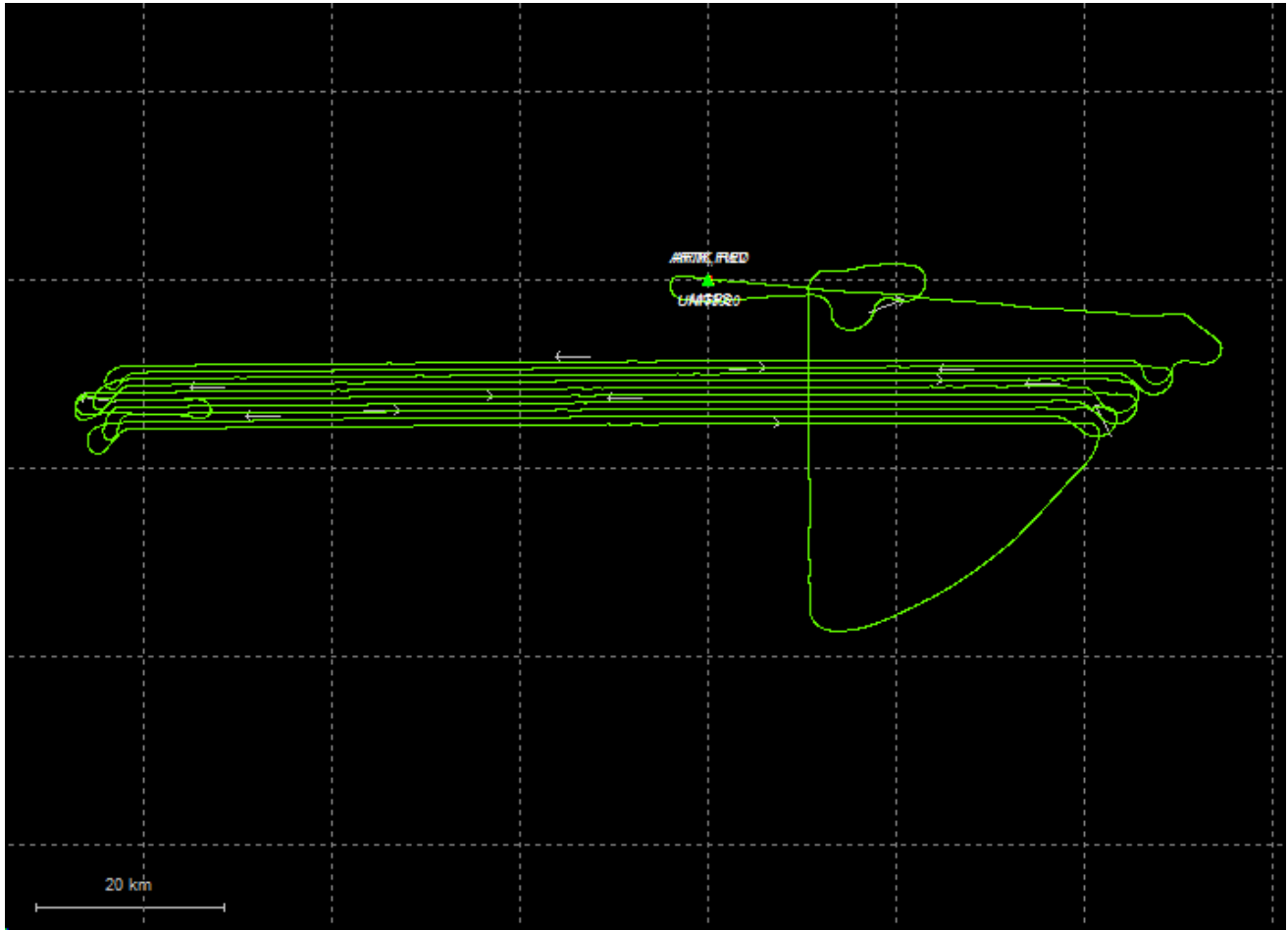
Acquisition and Processing details ----- Collection 14 (February 7, 2016)

Log:

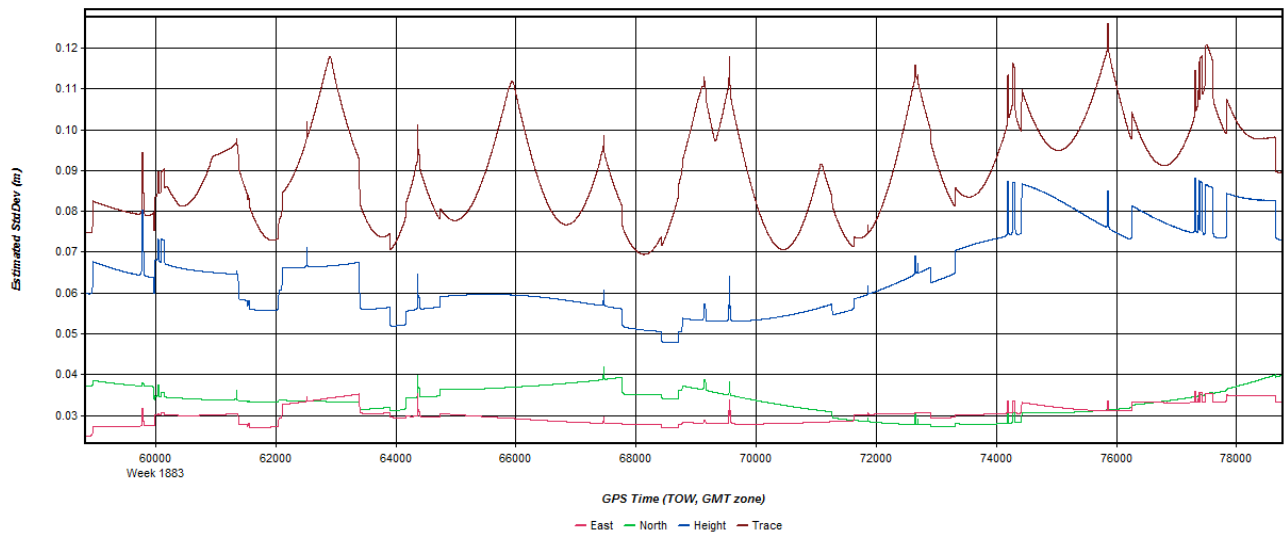
FUGRO		Fugro Geospatial, Inc.										Q680i Flight Log	
15.2		Lift Begin			Lift End			Flt	Flt	Hobbs	Activity		
		Airport	Chocks	Hobbs	Airport	Chocks	Hobbs	Duration	Hrs	Hrs			
1		H35	16:17	9842.8	H35	21:55	9848.5	5:38	5.75	5.7	0900-Production		
2													
3													

FGI Job #	Project Name			Operator		Unit	IMU				Ground Temp °C	Mn Range'	Data Logger Drives		
22.15005200	FEMA Dardanelle Reserv			Leonid Ereemeev		165	-				6.0 14.0	2100	DR680-10		
Flight Date	GPS Day	Lift	System	Pilot		Sun°	Solar Times (UTC)		Pulse Rate	Flying Temp °C		Max Range'	Download Drive		
7-Feb-16	16-038	14	R680i	Kris Farrell		-	-		240000	2.0 1.0		4052			
Mission ID (yyymmdd_Sen_Job_Lift)	Aircraft	Airport ID	FMS	UTC	AMT (ft)	Speed	FOV	Scan Rate (Hz)	MTA	km/WPT	AltM Setting	Humidity @ Alt	Shipping Track		
160207_165_15005200_14	N62912	H35	CCNS 7	-6	3400	140	-	100	2	0.623	30.22 30.03	-	808360526905		
Base 1 ID	Location	Rec ID	Ant ID	ARP (m)	Start Time (UTC)		Stop Time (UTC)		GPS Filename		Operator	Data			
FG201601	H35	GR3Unit3	GR3Unit3	1.8	07-Feb-16 15:26		08-Feb-16 01:31				Leonid Ereemeev	With AB			
Area	Flight #	Client	Wpt	Distance		UTC		Dir	Altitude	Speed	Scan	Comments and Conditions		SVs	PDOF
	FGI		From	To	Begin	End	Start	End	(GPS)	(knots)	Rate				
							16:21:00	16:26:00				GPS ground static		19	1.1
							16:39:00	16:42:00				S-turn for IMU alignment		18	1.2
680FT2	52		45	20	27.4	11.8	16:46:00	16:54:00	S	3,480	137	?	X-tie, partial	18	1.1
680FT1	44		151	1	93.4	0	17:03:00	17:26:00	W	3,540	128	?		19	1.1
	45		1	151	0	93.4	17:29:00	17:50:00	E	3,540	144	?		21	1.0
	46		154	1	95.3	0	17:53:00	18:17:00	W	3,720	131	?		18	1.1
	47		1	155	0	95.9	18:19:00	18:42:00	E	3,570	146	?		16	1.2
	48		156	1	96.6	0	18:45:00	19:09:00	W	3,680	132	?		16	1.2
	48		1	10	0	5.6	19:13:00	19:14:00	E	3,610	144	?	calibration line	17	1.0
	49		1	156	0	96.6	19:20:00	19:42:00	E	3,620	142	?		16	1.1
	50		161	1	99.7	0	19:45:00	20:09:00	W	3,600	131	?		16	1.2
	51		1	162	0	100	20:12:00	20:36:00	E	3,660	140	?		17	1.1
	52		163	1	101	0	20:38:00	21:02:00	W	3,870	130	?		17	1.2
	53		1	164	0	102	21:04:00	21:28:00	E	3,640	139	?		14	1.4
							21:28:00	21:31:00				?	S-turn for IMU alignment	14	1.2
							21:47:00	21:52:00					GPS ground static	15	1.1

Trajectory and GPS Plots:

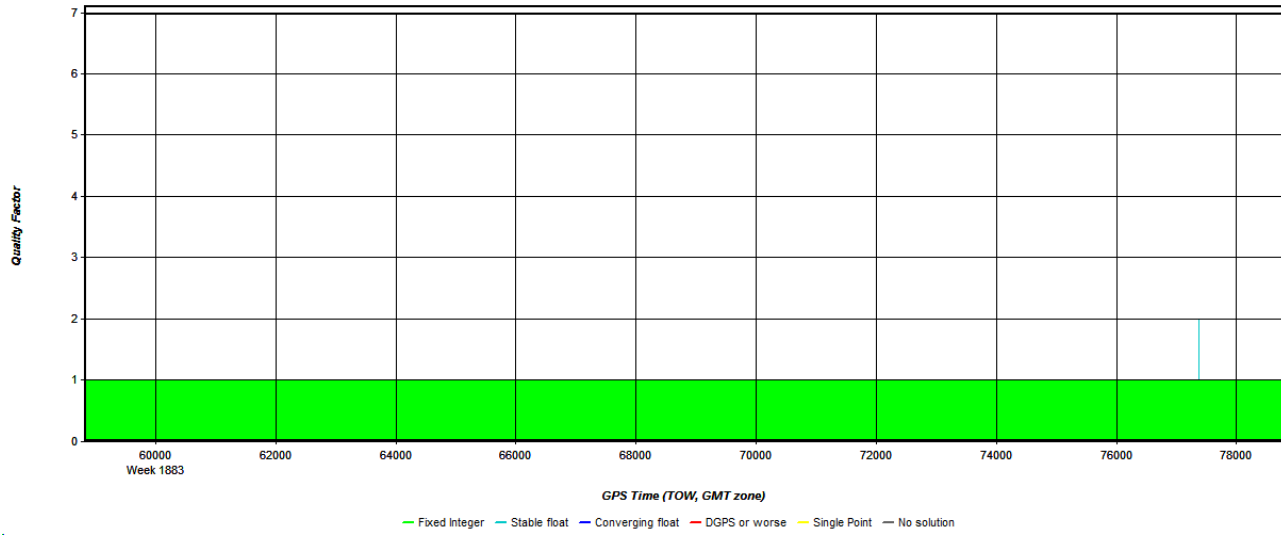


Estimated Accuracy

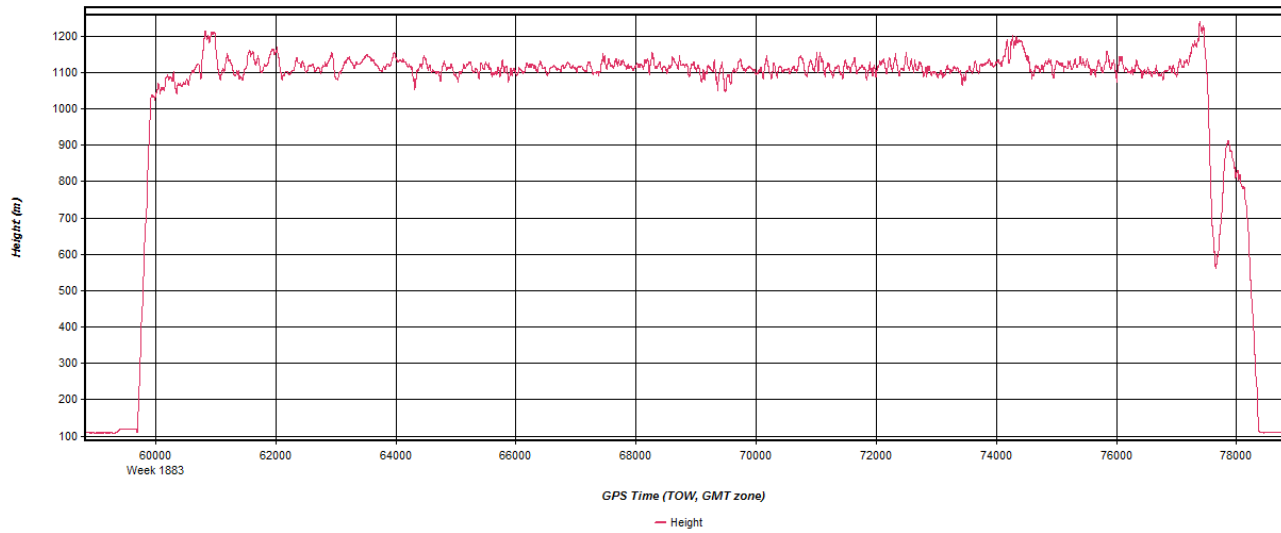




Quality Factor

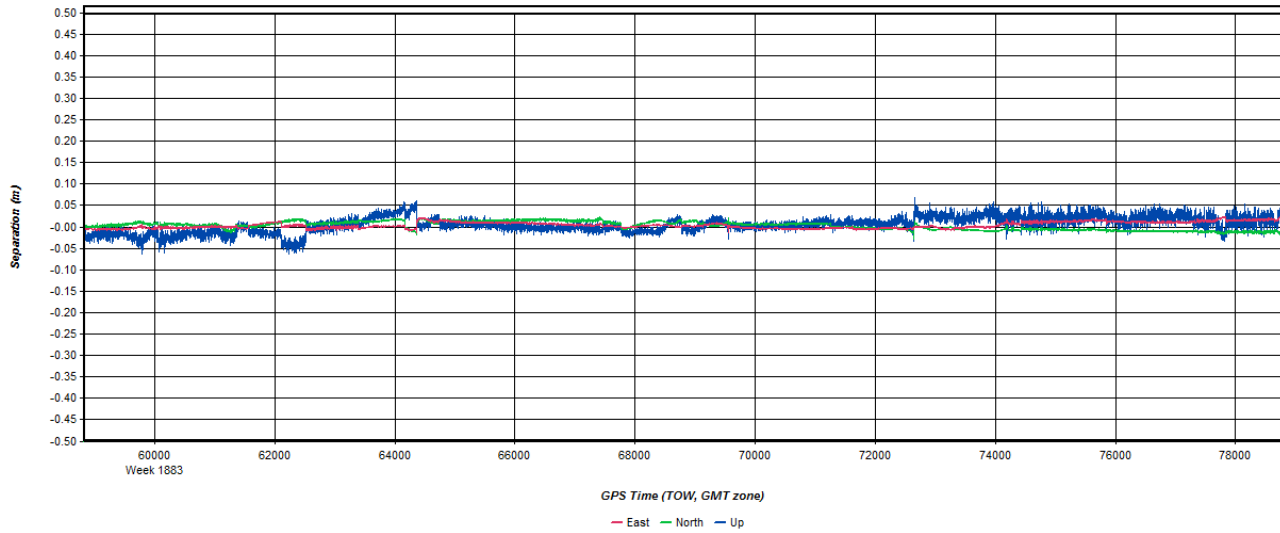


Height

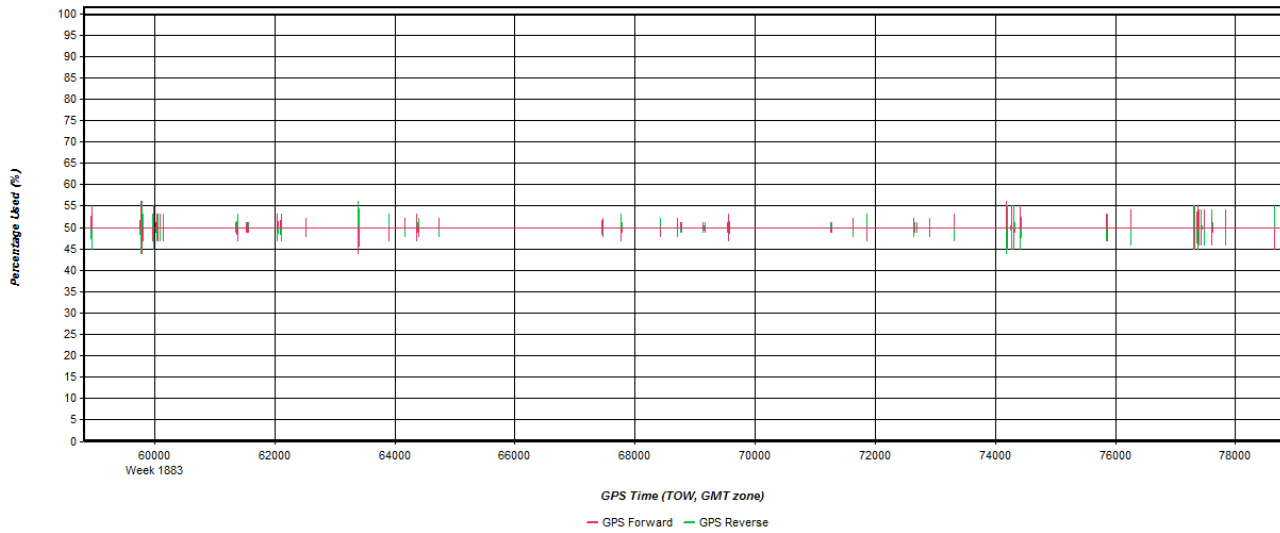




Combined Forward/Reverse Separation

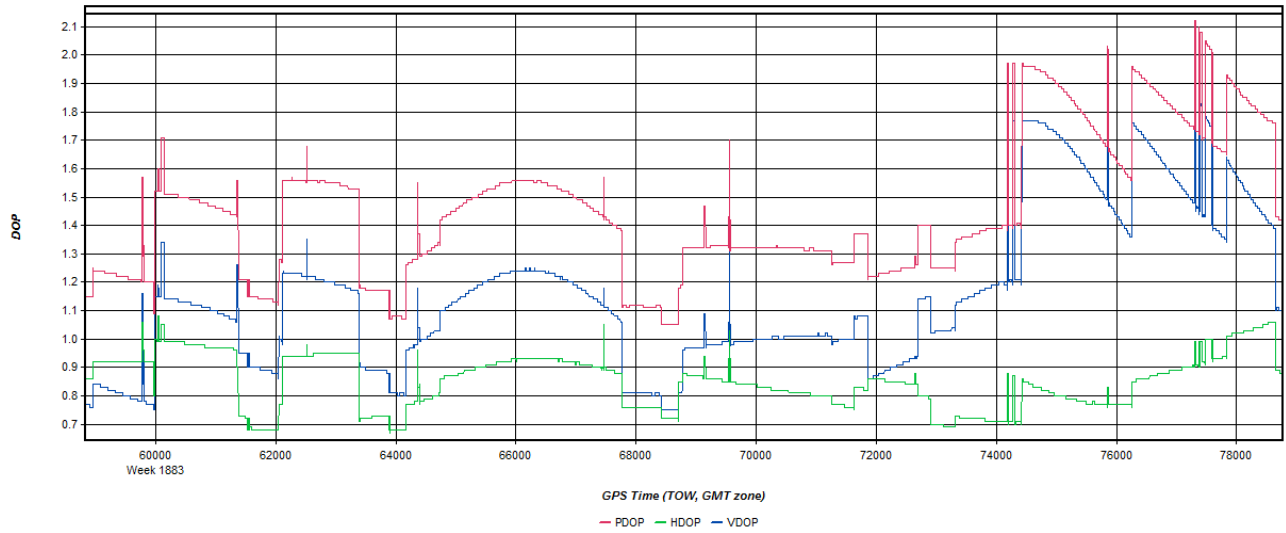


Combined Forward/Reverse Weighting

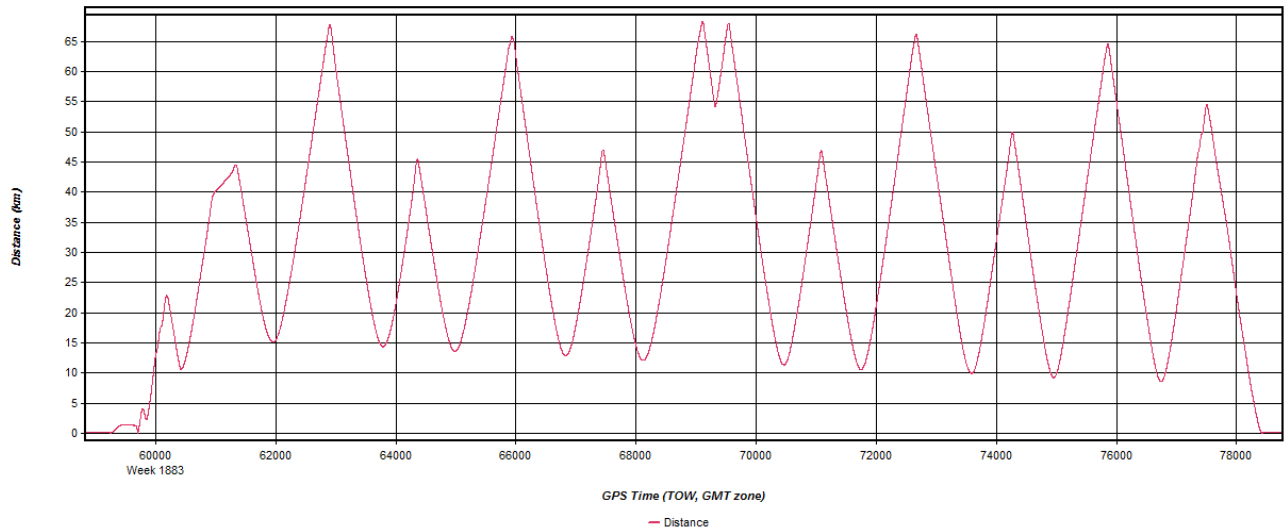




PDOP

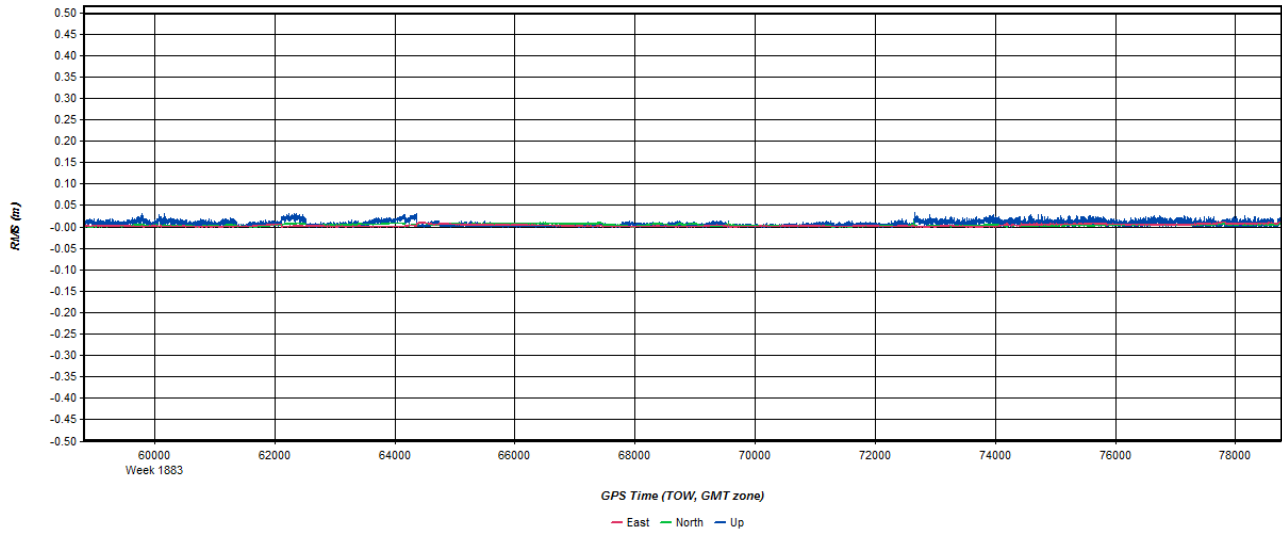


Distance from Base

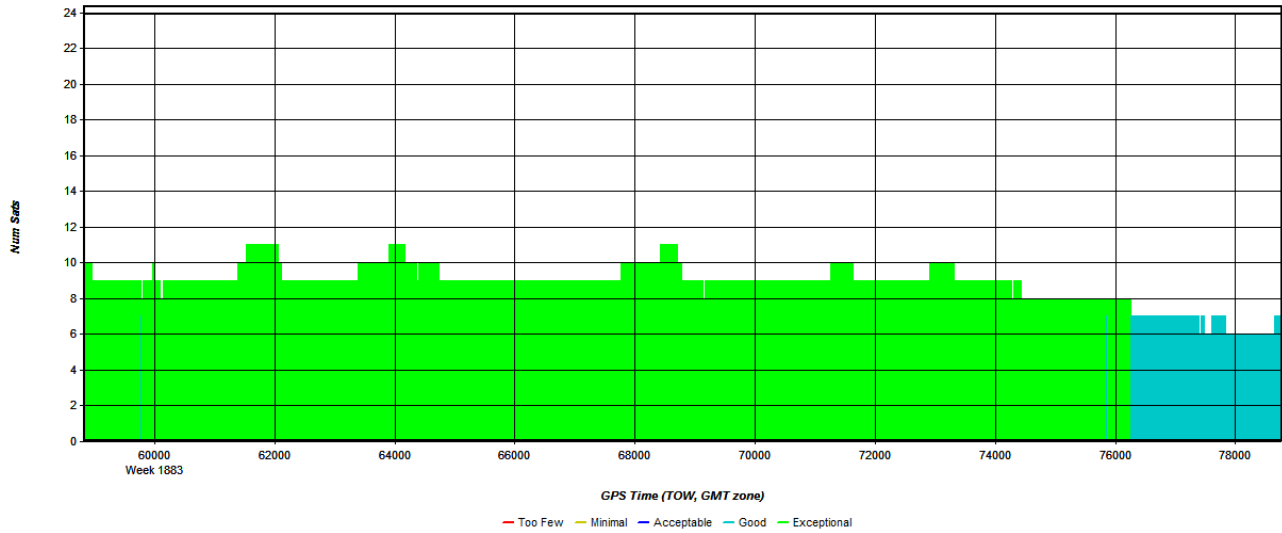




Combined RMS



SVs





Acquisition and Processing details ----- Collection 15 (February 7, 2016)

Log:



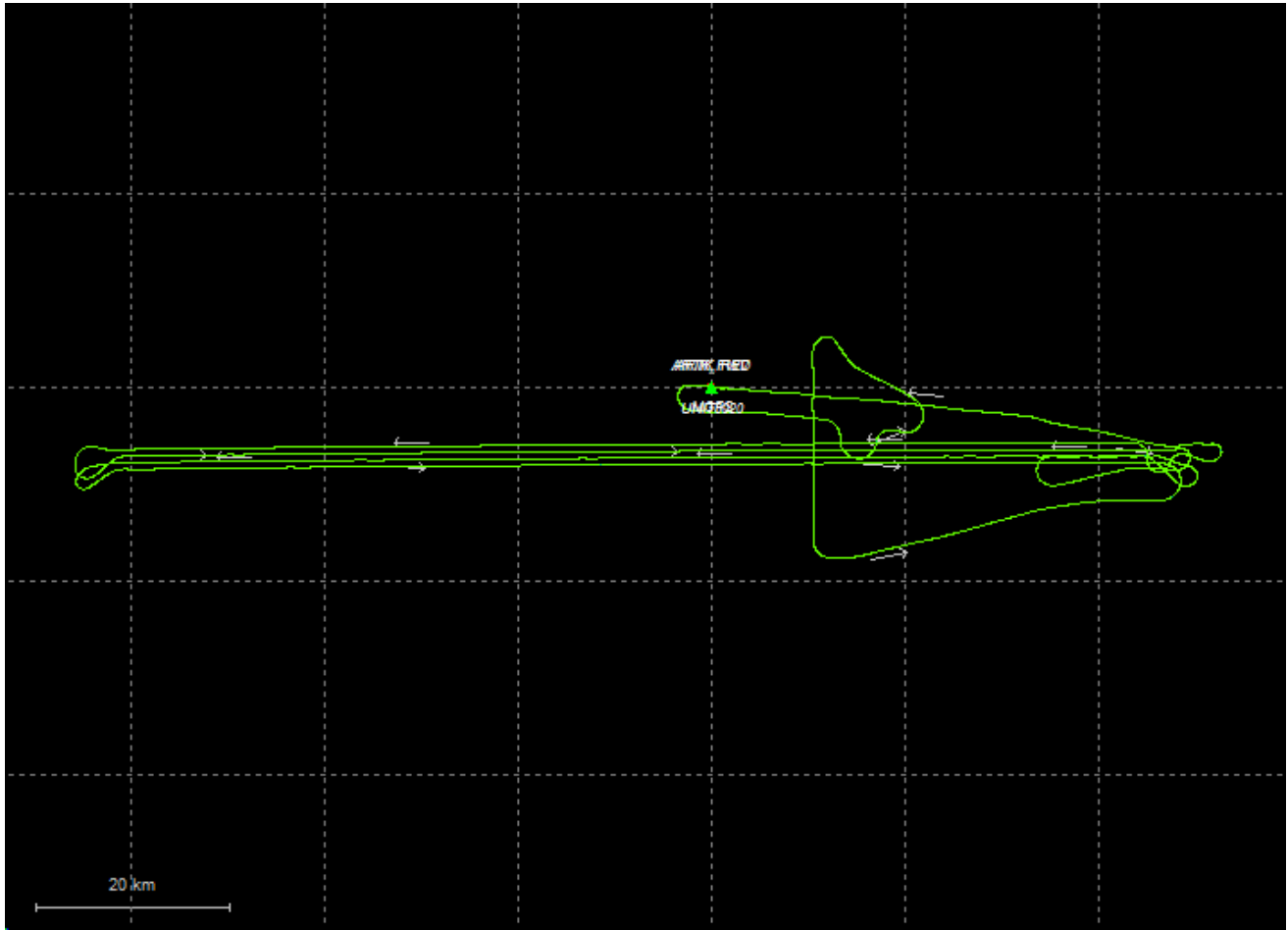
Fugro Geospatial, Inc.

15.2	Lift Begin			Lift End			Fit Duration	Fit Hrs	Hobbs Hrs	Activity
	Airport	Chocks	Hobbs	Airport	Chocks	Hobbs				
1	H35	22:20	9848.5	H35	1:25	9851.6	3:05	3:00	3:1	0900-Production
2										
3										

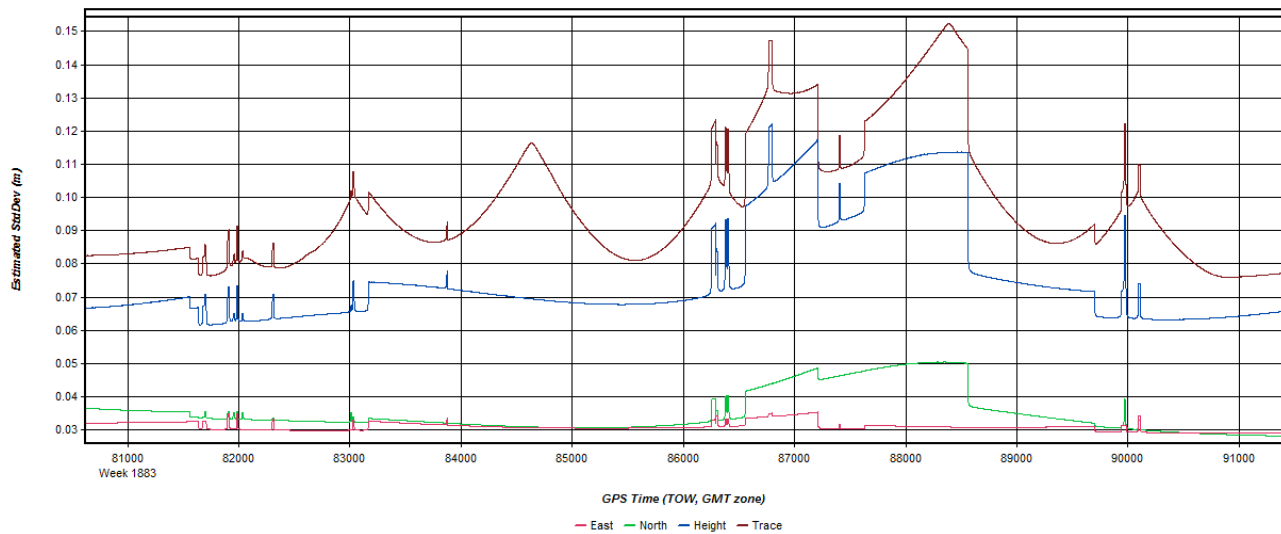
Q680i
Flight Log

FGI Job #	Project Name			Operator		Unit	IMU	Ground Temp °C			Min Range'	Data Logger Drives		
22.15005200	FEMA Dardanelle Reserv			Leonid Eremeev		165	-	14.0 12.0			2100	DR680-3		
Flight Date	GPS Day	Lift	System	Pilot		Sun*	Solar Times (UTC)		Pulse Rate	Flying Temp °C		Max Range'	Download Drive	
7-Feb-16	16-038	15	R680I	Kris Farrell		-	-		240000	1.0 1.0		4052		
Mission ID (yyymmdd_Sen_Job_Lift)		Aircraft	Airport ID	FMS	UTC	AMT (ft)	Speed	FOV	Scan Rate (Hz)	MTA	km/WPT	Altitude Setting	Humidity @ Alt	Shipping Track
160207_165_15005200_15		N62912	H35	CCNS 7	-6	3400	140	-	100	2	0.623	30.03 30.04	-	808360526905
Base 1 ID	Location	Rec ID	Ant ID	ARP (m)	Start Time (UTC)		Stop Time (UTC)		GPS Filename		Operator	Data		
FG201601	H35	GR3Unit3	GR3Unit3	1.8	07-Feb-16 15:26		08-Feb-16 01:31				Leonid Eremeev	With AB		
Area	Flight #	Wpt	Distance		UTC		Fit	Altitude	Speed	Scan	Comments and Conditions		SVs	PDOF
	FGI	Client	From	To	Begin	End	Dir	(GPS)	(knots)	Rate				
					22:26:00	22:31:00					GPS ground static		15	1.3
					22:44:00	22:47:00					S-turn for IMU alignment		18	1.1
680FT2	52	50 30	30.5	18.1	22:52:00	22:55:00	S	3,610	141	96 Hz	X-tie, partial		18	1.1
680FT1	54	164 1	102	0	23:05:00	23:28:00	W	3,870	142	96 Hz			19	1.0
	55	1 164	0	102	23:31:00	23:56:00	E	3,660	144	96 Hz			17	1.2
	55	164 154	102	95.3	23:59:00	0:01:00	W	3,780	137	96 Hz	calibration line, 2-mile data gap at WP 160 (at 0 hour 0 min gps time)		16	1.4
	56	164 1	102	0	0:07:00	0:31:00	W	3,900	136	96 Hz			16	1.3
	57	1 164	0	102	0:34:00	0:58:00	E	3,670	136	96 Hz			16	1.2
					0:58:00	1:01:00					S-turn for IMU alignment		17	1.1
					1:17:00	1:22:00					GPS ground static		17	1.1

Trajectory and GPS Plots:

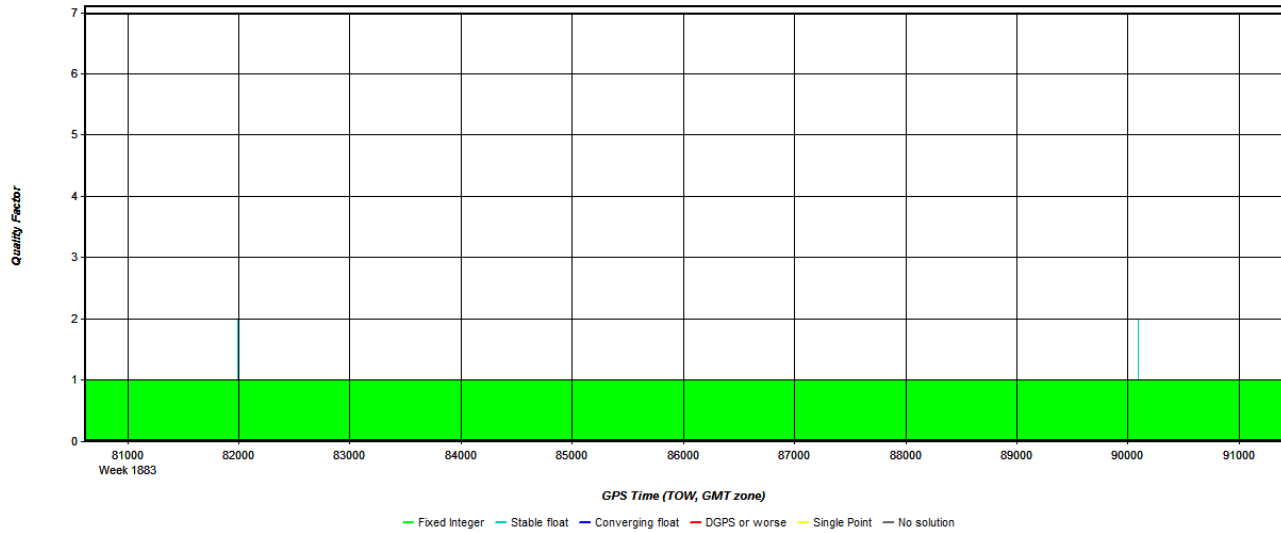


Estimated Accuracy

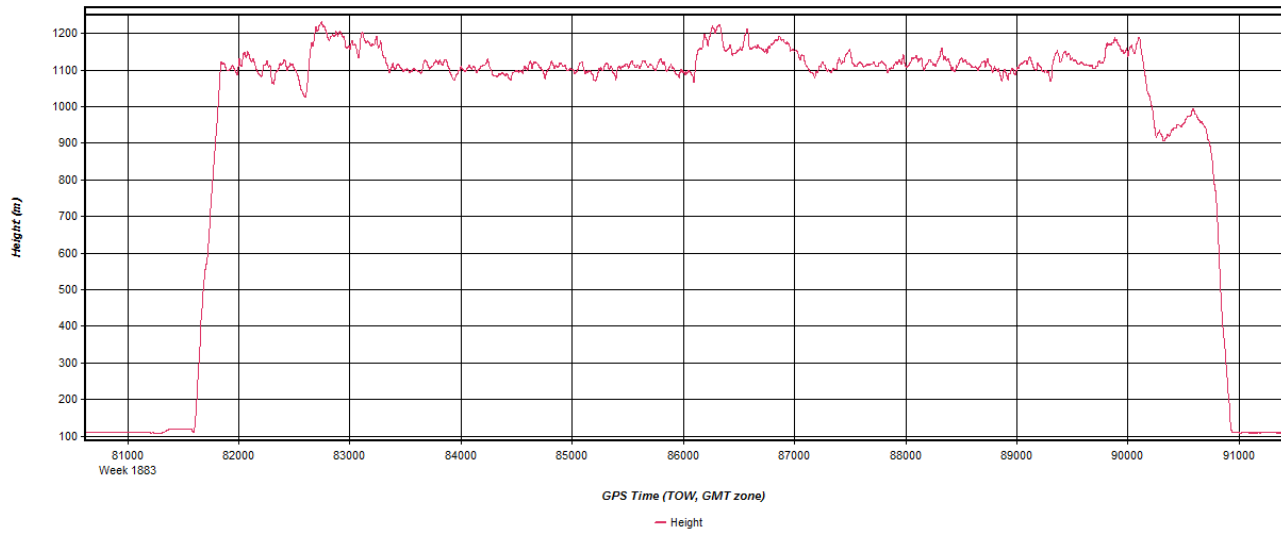




Quality Factor

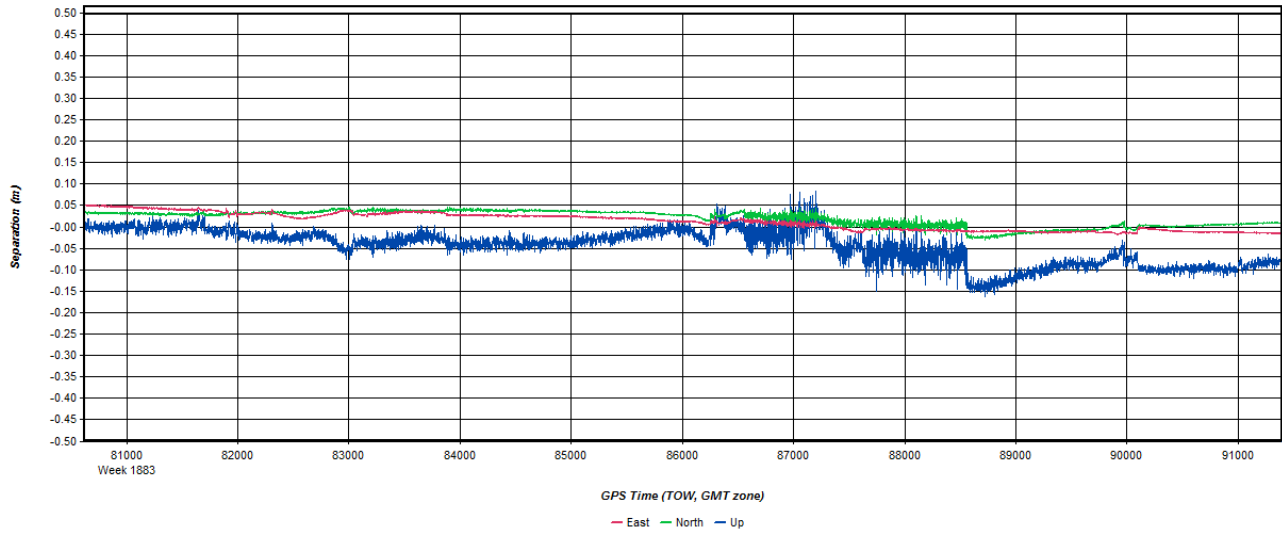


Height

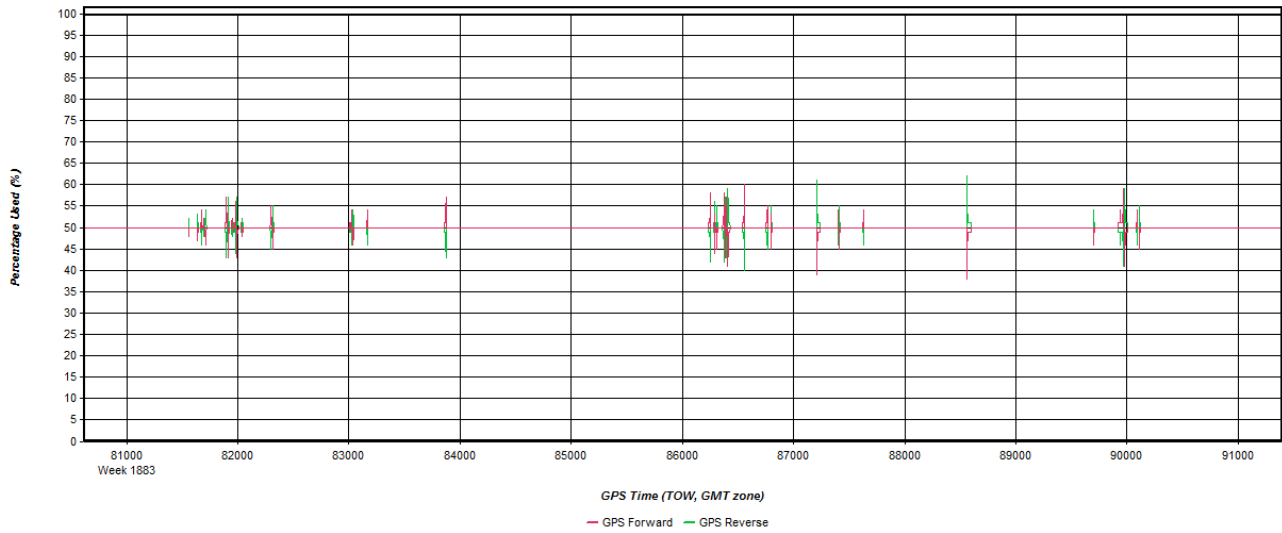




Combined Forward/Reverse Separation

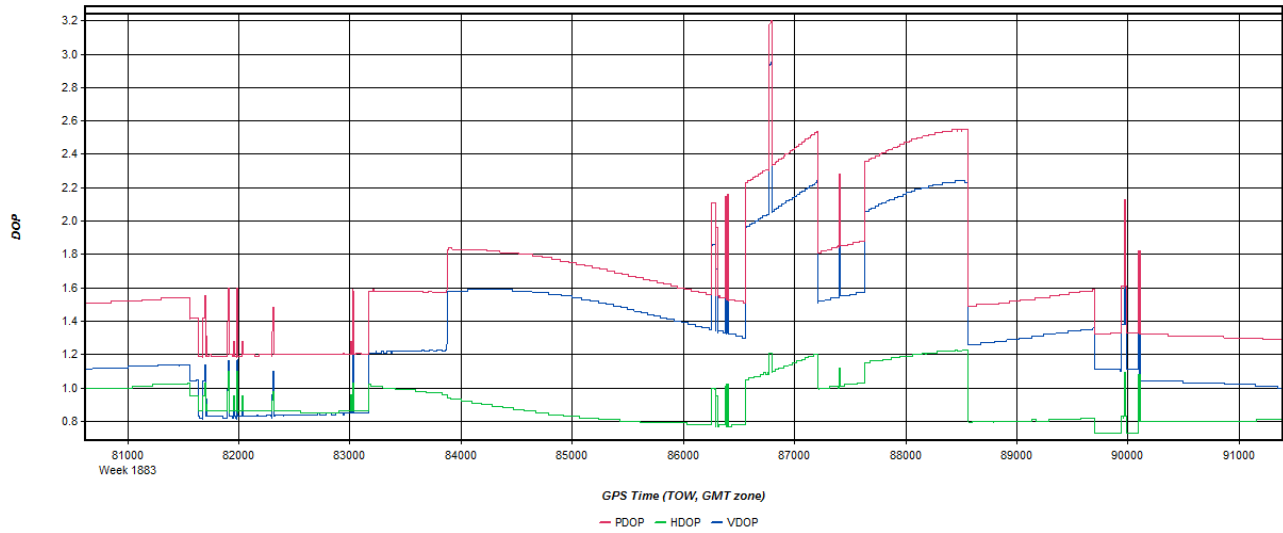


Combined Forward/Reverse Weighting

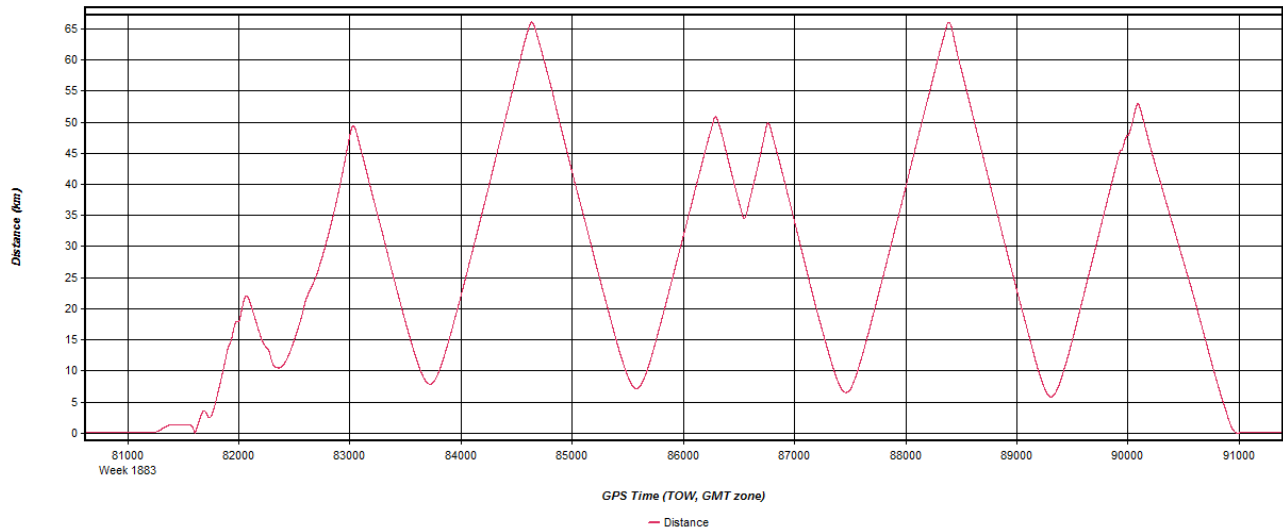




PDOP

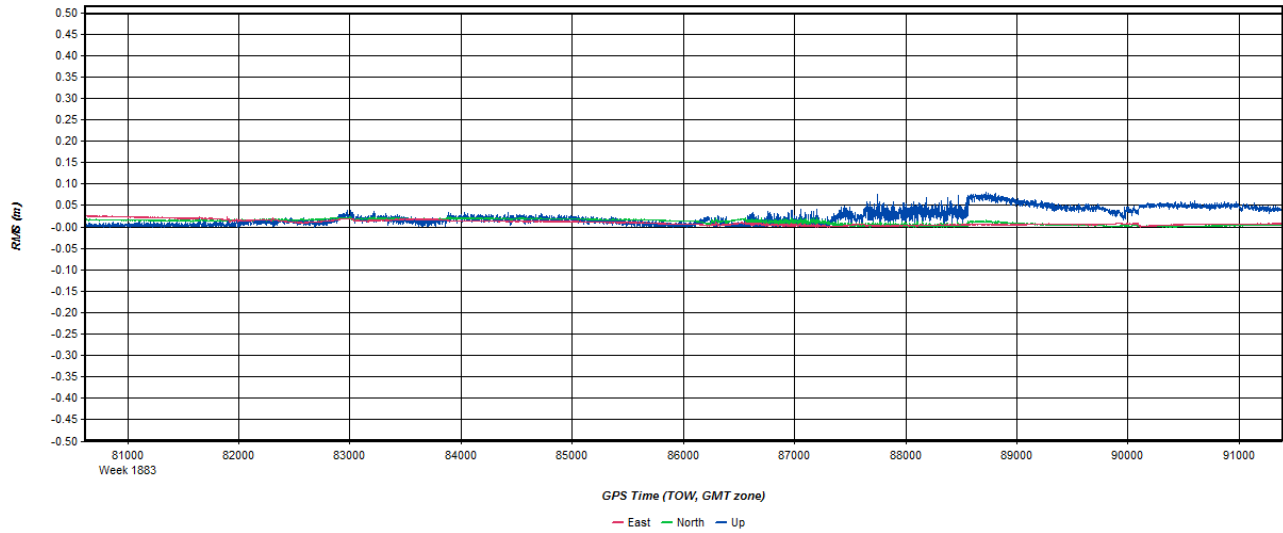


Distance from Base

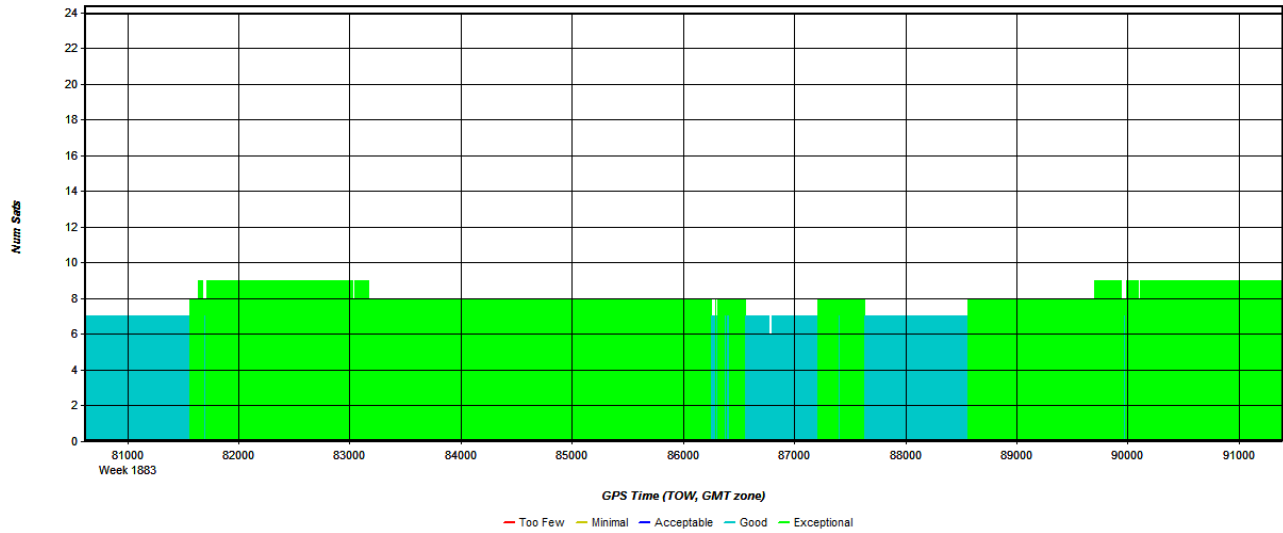




Combined RMS



SVs





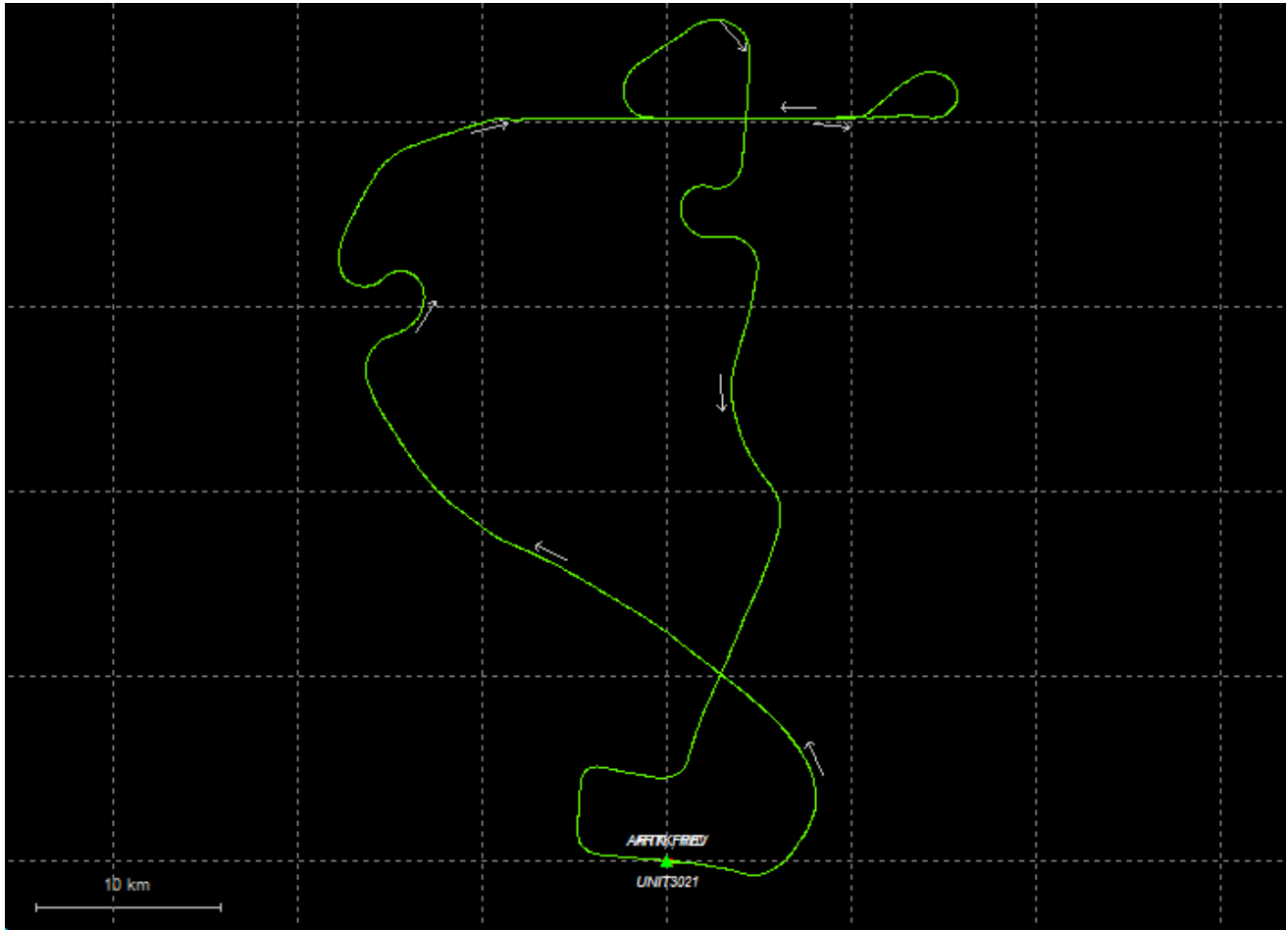
Acquisition and Processing details ----- Collection 16 (February 11, 2016)

Log:

FUGRO		Fugro Geospatial, Inc.										Q680i Flight Log	
15.2		Lift Begin			Lift End			Flt	Flt	Hobbs	Activity		
		Airport	Chocks	Hobbs	Airport	Chocks	Hobbs	Duration	Hrs	Hrs			
1		H35	0:38	9852.4	H35	1:48	9853.7	1:10	1.25	1.3	0900-Production		
2													
3													

FGI Job #	Project Name			Operator		Unit	IMU					Ground Temp °C	Min Range'	Data Logger Drives		
22.15005200	FEMA Dardanelle Reserv			Leonid Ereemeev		165	-					7.0	4.0	2100	DR680-12	
Flight Date	GPS Day	Lift	System	Pilot		Sun*	Solar Times (UTC)		Pulse Rate		Flying Temp °C		Max Range'	Download Drive		
11-Feb-16	16-042	16	R680I	Kris Farrell		-	-		240000		6.0 6.0		4052	EP750#22		
Mission ID (yyymmdd_Sen_Job_Lift)			Aircraft	Airport ID	FMS	UTC	AMT (ft)	Speed	FOV	Scan Rate (Hz)	MTA	km/WPT	Altitude Setting	Humidity @ Alt	Shipping Track	
160211_165_15005200_16			N62912	H35	CCNS 7	-6	3400	140	-	100	2	0.623	30.24 30.22	-		
Base 1 ID	Location		Rec ID	Ant ID	ARP (m)	Start Time (UTC)		Stop Time (UTC)		GPS Filename		Operator		Data		
FG201601	H35		GR3Unit3	GR3Unit3	1.8	11-Feb-16 00:25		11-Feb-16 02:20		UNIT30212a.tps		Leonid Ereemeev		With AB		
Area	Flight #		Wpt		Distance		UTC		Flt	Altitude	Speed	Scan	Comments and Conditions		SVs	PDOF
	FGI	Client	From	To	Begin	End	Start	End	Dir	(GPS)	(knots)	Rate				
							0:51:00	0:56:00					GPS ground static		18	1.1
							1:08:00	1:11:00					S-turn for IMU alignment		20	1.0
680FT2	40		1	9	0	5	1:15:00	1:17:00	E	4,430	141	96 Hz	partial re-flight		19	1.1
	40		9	1	5	0	1:21:00	1:23:00	W	5,430	125	96 Hz	calibration line		19	1.1
	N/A						1:25:00	1:27:00	S	4,990	154	96 Hz	x-tie, not a flight plan line		18	1.1
							1:27:00	1:30:00					S-turn for IMU alignment		18	1.1
							1:42:00	1:47:00					GPS ground static		17	1.3

Trajectory and GPS Plots:

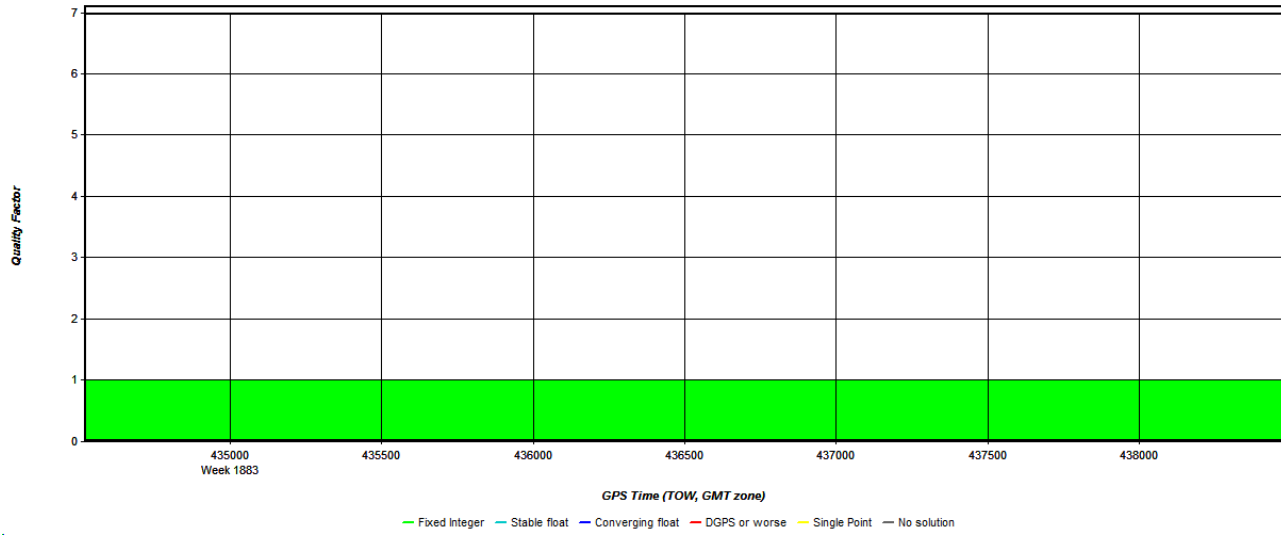


Estimated Accuracy

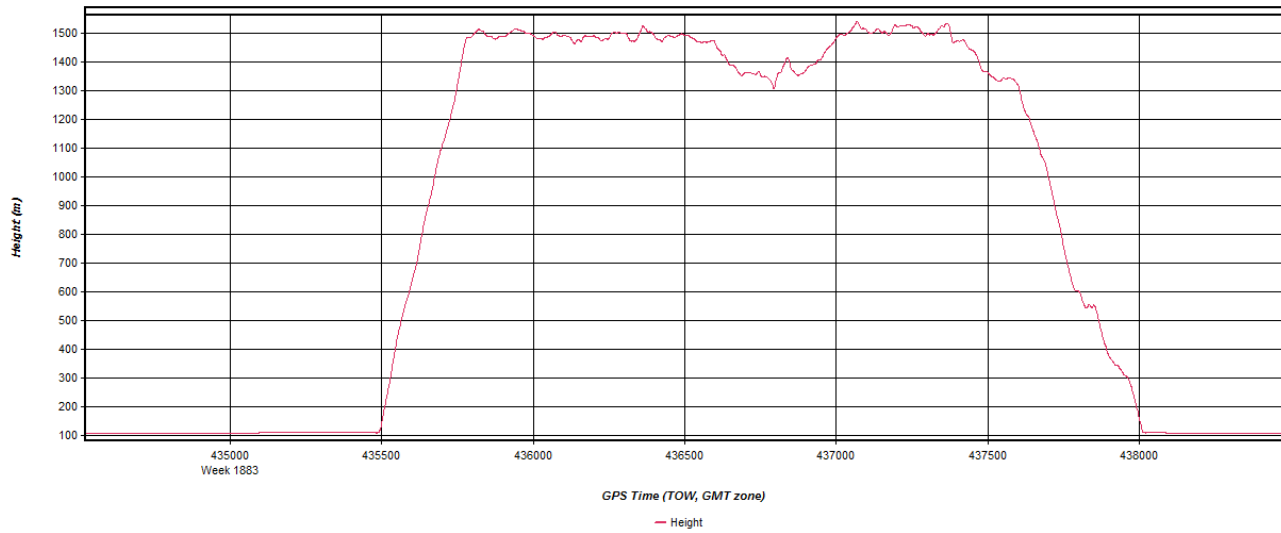




Quality Factor

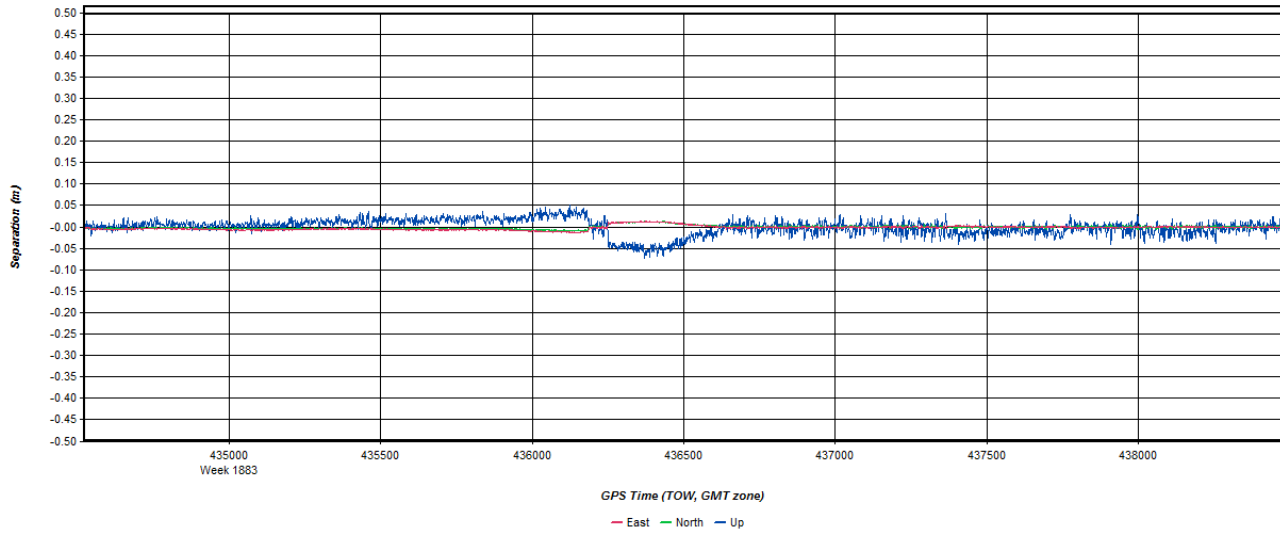


Height

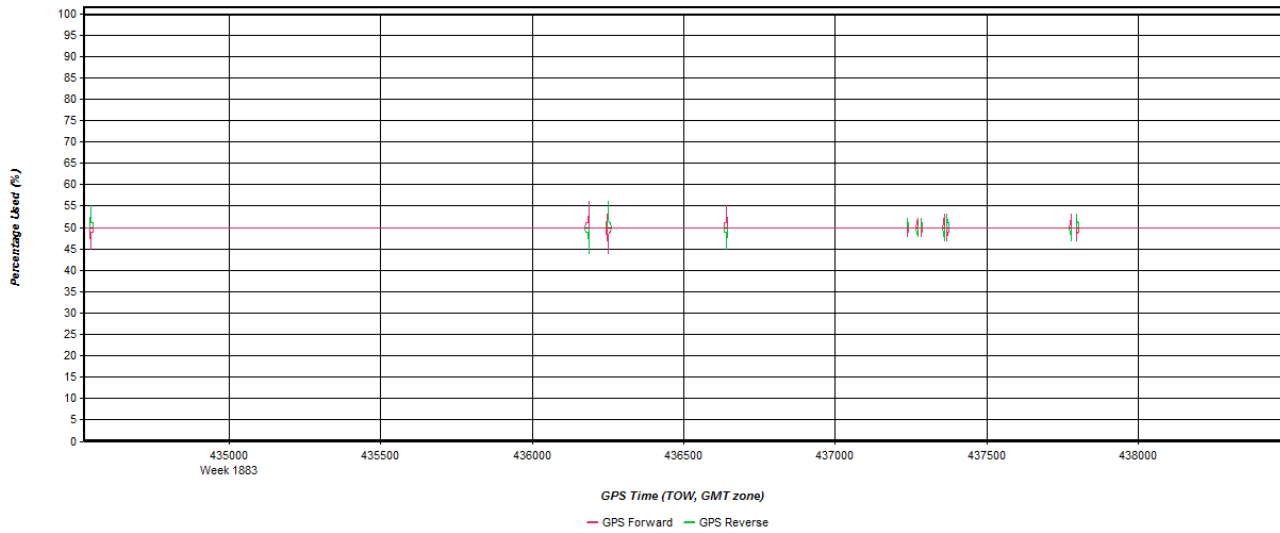




Combined Forward/Reverse Separation

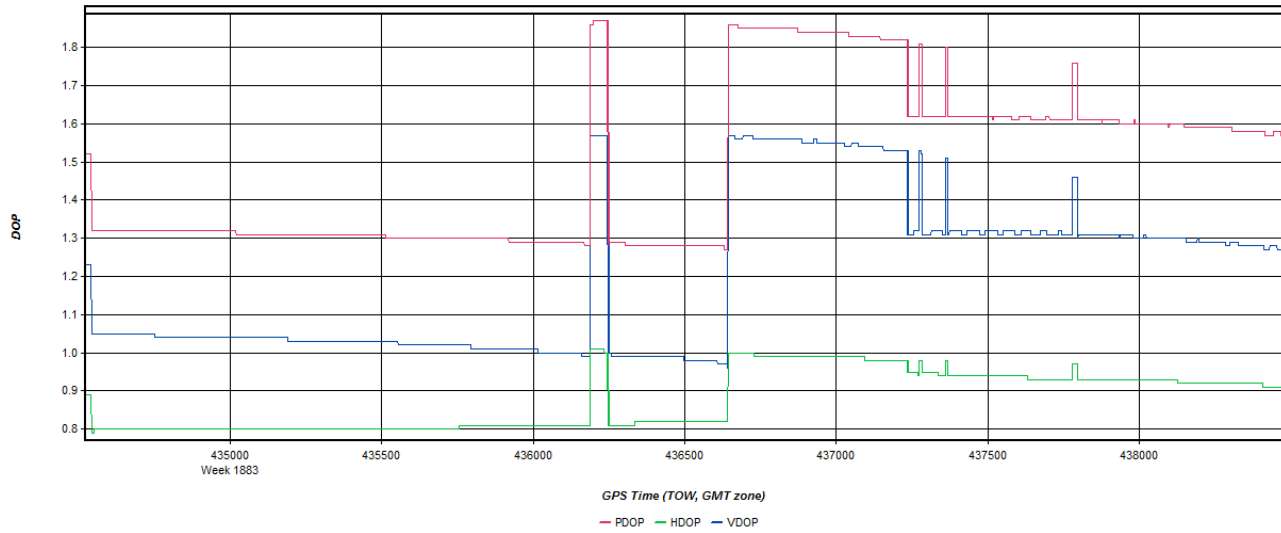


Combined Forward/Reverse Weighting

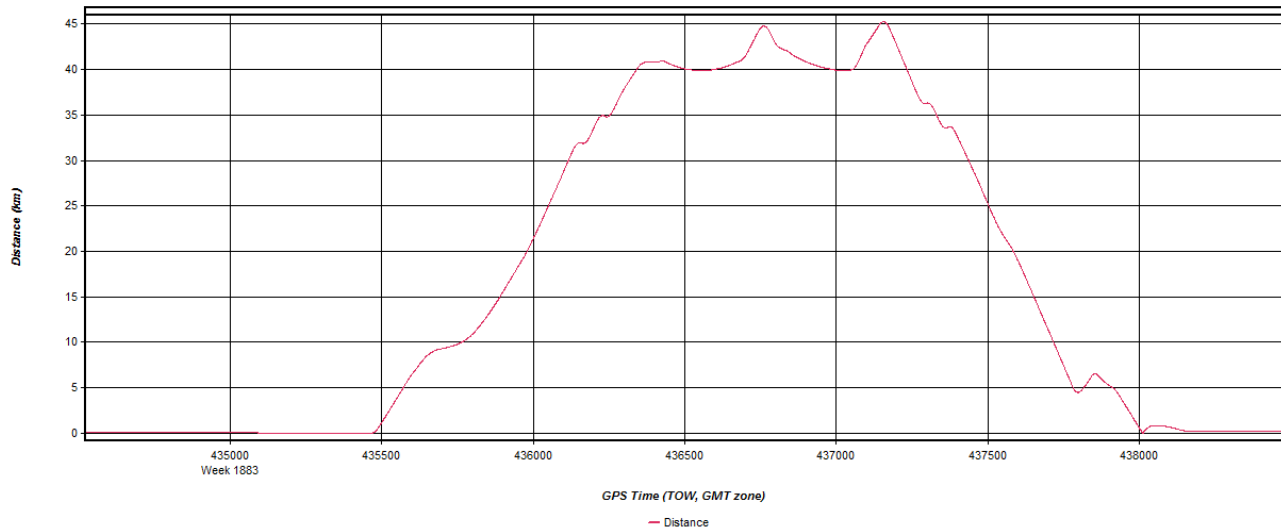




PDOP

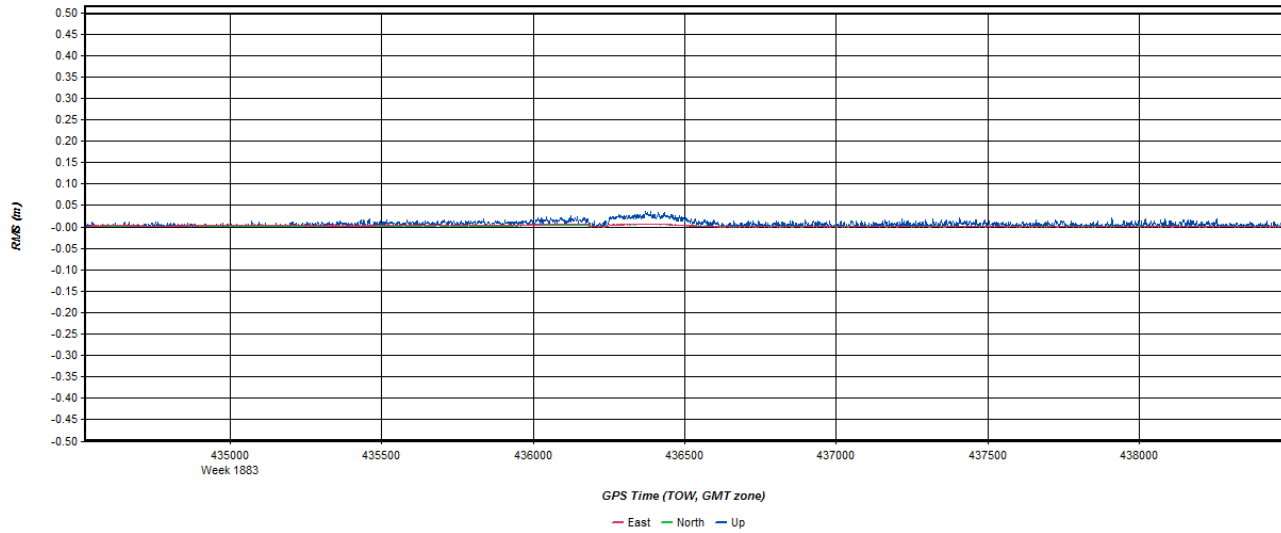


Distance from Base





Combined RMS



SVs

