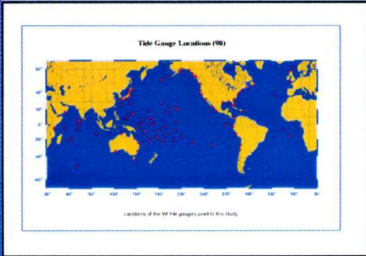


Altimetry-tide gauge comparisons for global sea level studies

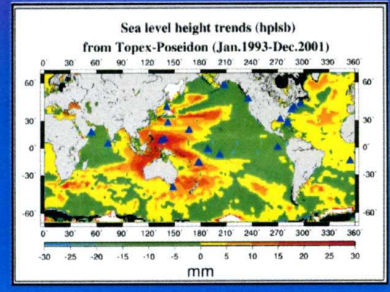
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First selection of 98 tide gauges with almost continuous records

In the past decade, altimetry and tide gauge-based sea level comparisons have proved to be a quite valuable method for detecting instrumental drifts and bias of onboard altimetric system. This approach, successfully applied to the Topex/Poseidon mission, will also be applied to Jason-1 (and Envisat as well). However, tide gauges suffer a number of well-known shortcomings, such as their uneven distribution preventing from accurate mapping of the sea level variability, and their location at coastlines that enhances perturbing effects of a number of phenomena such as vertical land motions and/or coastal oceanographic/meteorologic variability. Thus the choice of tide gauge sites suitable for precise calibration of altimetric systems is not trivial.

In this study, we considered global sea level data from the Topex/Poseidon mission for 1993-2001, as well as tide gauge records from the UHSLC. At each tide gauge site, we sub-sampled the Topex/Poseidon sea level and compared altimetry time series with tide gauge time series, both in terms of trend and interannual variability. Looking at sea level differences allowed us to identify a number of tide gauge sites suitable for future satellite altimetry calibration (e.g., Jason-1), with the assumption that Topex/Poseidon data now provide the reference information on global mean sea level variations. In a second step, we considered the above selected tide gauge sub-network and compared Jason-1 data with the tide gauge data, over the few Jason-1 cycles presently available.



Site	Lat	Lon	Topex Trend (mm/yr)	Tide Gauge Trend (mm/yr)	Difference (mm/yr)
Alaska	60	150	15	10	5
Alaska	65	155	20	15	5
Alaska	70	160	25	20	5
Alaska	75	165	30	25	5
Alaska	80	170	35	30	5
Alaska	85	175	40	35	5
Alaska	90	180	45	40	5
Alaska	95	185	50	45	5
Alaska	100	190	55	50	5
Alaska	105	195	60	55	5
Alaska	110	200	65	60	5
Alaska	115	205	70	65	5
Alaska	120	210	75	70	5
Alaska	125	215	80	75	5
Alaska	130	220	85	80	5
Alaska	135	225	90	85	5
Alaska	140	230	95	90	5
Alaska	145	235	100	95	5
Alaska	150	240	105	100	5
Alaska	155	245	110	105	5
Alaska	160	250	115	110	5
Alaska	165	255	120	115	5
Alaska	170	260	125	120	5
Alaska	175	265	130	125	5
Alaska	180	270	135	130	5
Alaska	185	275	140	135	5
Alaska	190	280	145	140	5
Alaska	195	285	150	145	5
Alaska	200	290	155	150	5
Alaska	205	295	160	155	5
Alaska	210	300	165	160	5
Alaska	215	305	170	165	5
Alaska	220	310	175	170	5
Alaska	225	315	180	175	5
Alaska	230	320	185	180	5
Alaska	235	325	190	185	5
Alaska	240	330	195	190	5
Alaska	245	335	200	195	5
Alaska	250	340	205	200	5
Alaska	255	345	210	205	5
Alaska	260	350	215	210	5
Alaska	265	355	220	215	5
Alaska	270	360	225	220	5
Alaska	275	365	230	225	5
Alaska	280	370	235	230	5
Alaska	285	375	240	235	5
Alaska	290	380	245	240	5
Alaska	295	385	250	245	5
Alaska	300	390	255	250	5
Alaska	305	395	260	255	5
Alaska	310	400	265	260	5
Alaska	315	405	270	265	5
Alaska	320	410	275	270	5
Alaska	325	415	280	275	5
Alaska	330	420	285	280	5
Alaska	335	425	290	285	5
Alaska	340	430	295	290	5
Alaska	345	435	300	295	5
Alaska	350	440	305	300	5
Alaska	355	445	310	305	5
Alaska	360	450	315	310	5
Alaska	365	455	320	315	5
Alaska	370	460	325	320	5
Alaska	375	465	330	325	5
Alaska	380	470	335	330	5
Alaska	385	475	340	335	5
Alaska	390	480	345	340	5
Alaska	395	485	350	345	5
Alaska	400	490	355	350	5
Alaska	405	495	360	355	5
Alaska	410	500	365	360	5
Alaska	415	505	370	365	5
Alaska	420	510	375	370	5
Alaska	425	515	380	375	5
Alaska	430	520	385	380	5
Alaska	435	525	390	385	5
Alaska	440	530	395	390	5
Alaska	445	535	400	395	5
Alaska	450	540	405	400	5
Alaska	455	545	410	405	5
Alaska	460	550	415	410	5
Alaska	465	555	420	415	5
Alaska	470	560	425	420	5
Alaska	475	565	430	425	5
Alaska	480	570	435	430	5
Alaska	485	575	440	435	5
Alaska	490	580	445	440	5
Alaska	495	585	450	445	5
Alaska	500	590	455	450	5
Alaska	505	595	460	455	5
Alaska	510	600	465	460	5
Alaska	515	605	470	465	5
Alaska	520	610	475	470	5
Alaska	525	615	480	475	5
Alaska	530	620	485	480	5
Alaska	535	625	490	485	5
Alaska	540	630	495	490	5
Alaska	545	635	500	495	5
Alaska	550	640	505	500	5
Alaska	555	645	510	505	5
Alaska	560	650	515	510	5
Alaska	565	655	520	515	5
Alaska	570	660	525	520	5
Alaska	575	665	530	525	5
Alaska	580	670	535	530	5
Alaska	585	675	540	535	5
Alaska	590	680	545	540	5
Alaska	595	685	550	545	5
Alaska	600	690	555	550	5
Alaska	605	695	560	555	5
Alaska	610	700	565	560	5
Alaska	615	705	570	565	5
Alaska	620	710	575	570	5
Alaska	625	715	580	575	5
Alaska	630	720	585	580	5
Alaska	635	725	590	585	5
Alaska	640	730	595	590	5
Alaska	645	735	600	595	5
Alaska	650	740	605	600	5
Alaska	655	745	610	605	5
Alaska	660	750	615	610	5
Alaska	665	755	620	615	5
Alaska	670	760	625	620	5
Alaska	675	765	630	625	5
Alaska	680	770	635	630	5
Alaska	685	775	640	635	5
Alaska	690	780	645	640	5
Alaska	695	785	650	645	5
Alaska	700	790	655	650	5
Alaska	705	795	660	655	5
Alaska	710	800	665	660	5
Alaska	715	805	670	665	5
Alaska	720	810	675	670	5
Alaska	725	815	680	675	5
Alaska	730	820	685	680	5
Alaska	735	825	690	685	5
Alaska	740	830	695	690	5
Alaska	745	835	700	695	5
Alaska	750	840	705	700	5
Alaska	755	845	710	705	5
Alaska	760	850	715	710	5
Alaska	765	855	720	715	5
Alaska	770	860	725	720	5
Alaska	775	865	730	725	5
Alaska	780	870	735	730	5
Alaska	785	875	740	735	5
Alaska	790	880	745	740	5
Alaska	795	885	750	745	5
Alaska	800	890	755	750	5
Alaska	805	895	760	755	5
Alaska	810	900	765	760	5
Alaska	815	905	770	765	5
Alaska	820	910	775	770	5
Alaska	825	915	780	775	5
Alaska	830	920	785	780	5
Alaska	835	925	790	785	5
Alaska	840	930	795	790	5
Alaska	845	935	800	795	5
Alaska	850	940	805	800	5
Alaska	855	945	810	805	5
Alaska	860	950	815	810	5
Alaska	865	955	820	815	5
Alaska	870	960	825	820	5
Alaska	875	965	830	825	5
Alaska	880	970	835	830	5
Alaska	885	975	840	835	5
Alaska	890	980	845	840	5
Alaska	895	985	850	845	5
Alaska	900	990	855	850	5
Alaska	905	995	860	855	5
Alaska	910	1000	865	860	5
Alaska	915	1005	870	865	5
Alaska	920	1010	875	870	5
Alaska	925	1015	880	875	5
Alaska	930	1020	885	880	5
Alaska	935	1025	890	885	5
Alaska	940	1030	895	890	5
Alaska	945	1035	900	895	5
Alaska	950	1040	905	900	5
Alaska	955	1045	910	905	5
Alaska	960	1050	915	910	5
Alaska	965	1055	920	915	5
Alaska	970	1060	925	920	5
Alaska	975	1065	930	925	5
Alaska	980	1070	935	930	5
Alaska	985	1075	940	935	5
Alaska	990	1080	945	940	5
Alaska	995	1085	950	945	5
Alaska	1000	1090	955	950	5
Alaska	1005	1095	960	955	5
Alaska	1010	1100	965	960	5
Alaska	1015	1105	970	965	5
Alaska	1020	1110	975	970	5
Alaska	1025	1115	980	975	5
Alaska	1030	1120	985	980	5
Alaska	1035	1125	990	985	5
Alaska	1040	1130	995	990	5
Alaska	1045	1135	1000	995	5
Alaska	1050	1140	1005	1000	5
Alaska	1055	1145	1010	1005	5
Alaska	1060	1150	1015	1010	5
Alaska	1065	1155	1020	1015	5
Alaska	1070	1160	1025	1020	5
Alaska	1075	1165	1030	1025	5
Alaska	1080	1170	1035	1030	5
Alaska	1085	1175	1040	1035	5
Alaska	1090	1180	1045	1040	5
Alaska	1095	1185	1050	1045	5
Alaska	1100	1190	1055	1050	5
Alaska	1105	1195	1060	1055	5
Alaska	1110	1200	1065	1060	5
Alaska	1115	1205	1070	1065	5
Alaska	1120	1210	1075	1070	5
Alaska	1125	1215	1080	1075	5
Alaska	1130	1220	1085	1080	5
Alaska	1135	1225	1090	1085	5
Alaska	1140	1230	1095	1090	5
Alaska	1145	1235	1100	1095	5
Alaska	1150	1240	1105	1100	5
Alaska	1155	1245	1110	1105	5
Alaska	1160	1250	1115	1110	5
Alaska	1165	1255	1120	1115	5
Alaska	1170	1260	1125	1120	5
Alaska	1175	1265	1130	1125	5
Alaska	1180	1270	113		