

SECCIÓN VI.- ANEXOS

VI.I.- PARÁMETROS ESTADÍSTICOS

Ruíz (2007) utilizó la metodología empedada de Folk y Ward (1957) para determinar los parámetros estadísticos de las muestras empleadas. A partir de la curva granulométrica se obtuvieron los diámetros nominales de interés ($d_5, d_{10}, d_{16}, d_{25}, d_{30}, d_{50}, d_{60}, d_{75}, d_{84}, d_{90}, d_{95}$), con unidades de milímetros a unidades Phi. Las ecuaciones para realizar tal transformación fueron:

$$\phi = -\log_2 d \quad (\text{VI.1})$$

$$d = 2^{-\phi} \quad (\text{VI.2})$$

donde:

d = diámetro nominal en cuestión de las partículas, en mm

ϕ = son las unidades Phi

Para conocer el diámetro medio, la desviación estándar, el sesgo y la curtosis de la muestra, se aplicaron las siguientes ecuaciones:

$$d_{\text{medio}} = \frac{\phi_{16} + \phi_{50} + \phi_{84}}{3} \quad (\text{VI.3})$$

$$\sigma = \frac{\phi_{84} - \phi_{16}}{4} - \frac{\phi_{95} - \phi_5}{6.6} \quad (\text{VI.4})$$

$$a = \frac{\phi_{16} + \phi_{84} - 2\phi_{50}}{2(\phi_{84} - \phi_{16})} + \frac{\phi_5 + \phi_{95} - 2\phi_{50}}{2(\phi_{95} - \phi_5)} \quad (\text{VI.5})$$

$$k = \frac{\phi_{95} - \phi_5}{2.44(\phi_{75} - \phi_{25})} \quad (\text{VI.6})$$

en donde ϕ_n representa el n-ésimo percentil en unidades Phi, a el sesgo y k la curtosis.

El objetivo de la estadística y distribución de tamaños fueron calculados para obtener el grado de clasificación y el posible mecanismo de depósito del material; por ejemplo, si la muestra presentara una forma leptocúrtica, el posible mecanismo de depositación es el oleaje (Serra, 1992). Finalmente se calcularon los coeficientes de uniformidad y de curvatura de la muestra con ayuda de las siguientes expresiones:

$$C_c = \frac{d_{30}^2}{d_{10} d_{60}} \quad (\text{VI.7})$$

$$C_u = \frac{d_{60}}{d_{10}} \quad (\text{VI.8})$$

en donde d_n representa el n-ésimo percentil, en mm

Con los valores proporcionados del análisis granulométrico, así como de la estadística y distribución de tamaños, las muestras de arena se clasificaron utilizando los tres criterios principales: la clasificación del A.S.T.M. (American Section of the International Association for the Testing Materials), la clasificación de Wentworth y el Sistema Unificado de Clasificación de los Suelos (S.U.C.S)

Para complementar esta parte se explicará en qué consisten las unidades Phi.

Las escalas granulométricas son subdivisiones arbitrarias de una sucesión continua de tamaños de granos. Esta subdivisión se hace por las siguientes razones: 1) estandarizar la terminología sedimentológica y 2) simplificar los análisis estadísticos de los sedimentos.

La escala granulométrica debe ser una escala regular para que sea útil en estadística, de tal manera que los términos mantengan una relación simple entre sí. Si, por ejemplo, se quisiera una relación lineal esta resultaría inadecuada, pues si se tomara el milímetro como unidad, la arcilla, el limo y casi toda la arena deberían colocarse en una clase y solo la arena gruesa y la grava serían subdivisibles. En cambio, una escala geométrica sería más apropiada, pues da origen a unidades más pequeñas para las partículas menores y grandes para las mayores. Además, al graficar lo antes explicado, se realiza sobre una escala logarítmica, de tal manera que todos los intervalos geométricos quedan espaciados de igual manera.

La escala granulométrica más utilizada actualmente es la de Udden, modificada por Wentworth (1922) y por el Comité Lane (1947), llamada Udden – Wentworth. Esta toma el milímetro como punto de partida y establece subdivisiones utilizando la razón 2 o $\frac{1}{2}$ (la primera en orden creciente y la segunda en orden decreciente), así los límites de clases en esta escala quedan como: ..., 128 mm, 64 mm, 32 mm, 16 mm, 8 mm, 4 mm, 2 mm, 1 mm, $\frac{1}{2}$ mm, $\frac{1}{4}$ mm, $\frac{1}{8}$ mm, $\frac{1}{16}$ mm, etc.

Al trabajar con material bien seleccionados se hace necesario introducir un mayor número de grados en cada intervalo, por lo tanto se subdivide cada clase en 2 ó 4 subclases. Al hacerlo aparecen números irracionales pues la subdivisión debe ser geométrica y no aritmética (raíz cuadrada o cuarta del producto de los extremos).

Para solucionar esto, Krumbein ideó la escala Phi (ϕ). Esta se basa en que los límites de los intervalos de clase de la escala Udden – Wentworth son potencias de 2, y por lo tanto se pueden expresar como logaritmos enteros base 2. Al dividir cada intervalo en 2 o 4 subdivisiones (tabla VI.1), los nuevos límites se expresan en la escala Phi como números decimales. Finalmente, para evitar trabajar con números negativos al tratar las partículas más finas (menores de 1 mm), se toma el logaritmo negativo base 2, llegando a la expresión VI.1. Como ejercicio, se puede verificar que para un $d = 8$ mm, corresponde un $\phi = -3$, y para un $d = 1/16$ mm, corresponde un $\phi = 4$.

Tabla VI.1 Escala Udden – Wentworth, Tripaldi (2000)

	U. Wentworth (mm)	2 (mm)	4 (mm)	phi	tamiz
Bloque	1024,0000			-10,00	
	256,0000			-8,00	
Guijarro	128,0000			-7,00	
G	64,0000			-6,00	
R	32,0000			-5,00	
A Guija	16,0000			-4,00	
V	8,0000			-3,00	4
A	4,0000	4,00000	4,00000	-2,00	5
Sábulo o Gránulo			3,36000	-1,75	6
		2,83000	2,83000	-1,50	7
			2,38000	-1,25	8
	2,0000	2,00000	2,00000	-1,00	10
			1,68000	-0,75	12
Muy gruesa		1,41000	1,41000	-0,50	14
			1,19000	-0,25	16
	1,0000	1,00000	1,00000	0,00	18
			0,84000	0,25	20
Gruesa		0,70700	0,70700	0,50	25
A			0,59500	0,75	30
R	0,5000	0,50000	0,50000	1,00	35
E			0,42000	1,25	40
N Mediana		0,35400	0,35400	1,50	45
A			0,29700	1,75	50
	0,2500	0,25000	0,25000	2,00	60
			0,21000	2,25	70
Fina		0,17700	0,17700	2,50	80
			0,14900	2,75	100
	0,1250	0,12500	0,12500	3,00	120
			0,10500	3,25	140
Muy fina		0,08800	0,08800	3,50	170
			0,07400	3,75	200
	0,0625	0,06200	0,06200	4,00	230
			0,05300	4,25	
Grueso		0,04400	0,04400	4,50	
			0,03700	4,75	
	0,0313	0,03120	0,03120	5,00	
			0,02660	5,25	
L Mediano		0,02200	0,02200	5,50	
I			0,01880	5,75	
M	0,0156	0,01560	0,01560	6,00	
O			0,01330	6,25	
Fino		0,01100	0,01100	6,50	
			0,00940	6,75	
	0,0078	0,00780	0,00780	7,00	
			0,00660	7,25	
Muy fino		0,00550	0,00550	7,50	
			0,00470	7,75	
	0,0039	0,00390	0,00390	8,00	
			0,00330	8,25	
A		0,00276	0,00276	8,50	
R			0,00232	8,75	
C	0,0020	0,00195	0,00195	9,00	
I			0,00164	9,25	
L		0,00138	0,00138	9,50	
L			0,00116	9,75	
A	0,0010	0,00098	0,00098	10,00	
			0,00082	10,25	
		0,00069	0,00069	10,50	

VI.II.- ERRORES ABSOLUTOS Y RELATIVOS DE VELOCIDAD DE CAÍDA

A continuación se presentan parte de los resultados correspondientes a los errores absolutos y relativos de velocidad de caída.

Tabla VI.2 Errores absolutos y relativos para el sitio Boca Sur, zona foreshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.02511	0.0388	-0.01369	0.01369	35.2887	0.64716495	0.025608	0.000498	1.94%	1
Van	0.02511	0.04347	-0.01836	0.01836	42.23471	0.57763975	0.0286902	0.0035802	12.48%	0
Sou	0.02511	0.0443	-0.01919	0.01919	43.31633	0.56681716	0.029238	0.004128	14.12%	0
Ahr	0.02511	0.03975	-0.01464	0.01464	36.83634	0.63169811	0.026235	0.001125	4.29%	1
Zan	0.02511	0.04347	-0.01836	0.01836	42.23471	0.57763975	0.0286902	0.0035802	12.48%	0
Jul	0.02511	0.04385	-0.01874	0.01874	42.73278	0.57263398	0.028941	0.003831	13.24%	0
Che	0.02511	0.03987	-0.01476	0.01476	37.01882	0.62979684	0.0263142	0.0012042	4.58%	1
Jim	0.02511	0.04059	-0.01548	0.01548	38.14002	0.61862528	0.0267894	0.0016794	6.27%	0
Rub	0.02511	0.04071	-0.0156	0.0156	38.32613	0.61680177	0.0268686	0.0017586	6.55%	0
Cha	0.02511	0.04134	-0.01623	0.01623	39.26241	0.60740203	0.0272844	0.0021744	7.97%	0
Swa	0.02511	0.03969	-0.01458	0.01458	36.73805	0.63265306	0.0261954	0.0010854	4.14%	1
Cam	0.02511	0.03791	-0.0128	0.0128	33.76561	0.66235822	0.0250206	8.94E-05	0.36%	1

Tabla VI.3 Errores absolutos y relativos para el sitio Puerto Morelos Estación UNAM, zona offshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.03703	0.04432	-0.00729	0.00729	16.45112	0.83551444	0.037672	0.000642	1.70%	1
Van	0.03703	0.04972	-0.01269	0.01269	25.5189	0.74477072	0.042262	0.005232	12.38%	0
Sou	0.03703	0.0507	-0.01367	0.01367	26.95974	0.73037475	0.043095	0.006065	14.07%	0
Ahr	0.03703	0.04559	-0.00856	0.00856	18.78342	0.81223953	0.0387515	0.0017215	4.44%	1
Zan	0.03703	0.04972	-0.01269	0.01269	25.5189	0.74477072	0.042262	0.005232	12.38%	0
Jul	0.03703	0.04972	-0.01269	0.01269	25.51716	0.74477072	0.042262	0.005232	12.38%	0
Che	0.03703	0.04554	-0.00851	0.00851	18.68065	0.81313131	0.038709	0.001679	4.34%	1
Jim	0.03703	0.04674	-0.00971	0.00971	20.78204	0.79225503	0.039729	0.002699	6.79%	0
Rub	0.03703	0.04699	-0.00996	0.00996	21.2006	0.78804001	0.0399415	0.0029115	7.29%	0
Cha	0.03703	0.04769	-0.01066	0.01066	22.35518	0.77647306	0.0405365	0.0035065	8.65%	0
Swa	0.03703	0.04901	-0.01198	0.01198	24.44275	0.75556009	0.0416585	0.0046285	11.11%	0
Cam	0.03703	0.04359	-0.00656	0.00656	15.05107	0.84950677	0.0370515	2.15E-05	0.06%	1

Tabla VI.4 Errores absolutos y relativos para el sitio Puerto Morelos 3, zona foreshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.01718	0.02792	-0.01074	0.01074	38.45629	0.61532951	0.0198232	0.0026432	13.33%	0
Van	0.01718	0.02981	-0.01263	0.01263	42.36512	0.57631667	0.0211651	0.0039851	18.83%	0
Sou	0.01718	0.03032	-0.01314	0.01314	43.34195	0.56662269	0.0215272	0.0043472	20.19%	0
Ahr	0.01718	0.02787	-0.01069	0.01069	38.35996	0.61643344	0.0197877	0.0026077	13.18%	0
Zan	0.01718	0.02981	-0.01263	0.01263	42.36512	0.57631667	0.0211651	0.0039851	18.83%	0
Jul	0.01718	0.03084	-0.01366	0.01366	44.29664	0.55706874	0.0218964	0.0047164	21.54%	0
Che	0.01718	0.02789	-0.01071	0.01071	38.39267	0.61599139	0.0198019	0.0026219	13.24%	0
Jim	0.01718	0.02773	-0.01055	0.01055	38.04586	0.61954562	0.0196883	0.0025083	12.74%	0
Rub	0.01718	0.02757	-0.01039	0.01039	37.69476	0.6231411	0.0195747	0.0023947	12.23%	0
Cha	0.01718	0.02802	-0.01084	0.01084	38.68363	0.61313348	0.0198942	0.0027142	13.64%	0
Swa	0.01718	0.02468	-0.0075	0.0075	30.39422	0.69611021	0.0175228	0.0003428	1.96%	1
Cam	0.01718	0.02391	-0.00673	0.00673	28.15638	0.71852781	0.0169761	0.0002039	1.20%	1

Tabla VI.5 Errores absolutos y relativos para el sitio Punto 2, zona backshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.02667	0.03483	-0.00816	0.00816	23.42546	0.76571921	0.027864	0.001194	4.29%	1
Van	0.02667	0.03863	-0.01196	0.01196	30.96556	0.69039607	0.030904	0.004234	13.70%	0
Sou	0.02667	0.03934	-0.01267	0.01267	32.2145	0.67793594	0.031472	0.004802	15.26%	0
Ahr	0.02667	0.03544	-0.00877	0.00877	24.73965	0.7525395	0.028352	0.001682	5.93%	0
Zan	0.02667	0.03863	-0.01196	0.01196	30.96556	0.69039607	0.030904	0.004234	13.70%	0
Jul	0.02667	0.03932	-0.01265	0.01265	32.1705	0.67828077	0.031456	0.004786	15.21%	0
Che	0.02667	0.03559	-0.00892	0.00892	25.06522	0.7493678	0.028472	0.001802	6.33%	0
Jim	0.02667	0.03593	-0.00926	0.00926	25.77768	0.74227665	0.028744	0.002074	7.22%	0
Rub	0.02667	0.03594	-0.00927	0.00927	25.79571	0.74207012	0.028752	0.002082	7.24%	0
Cha	0.02667	0.03651	-0.00984	0.00984	26.95006	0.7304848	0.029208	0.002538	8.69%	0
Swa	0.02667	0.0373	-0.01063	0.01063	28.49813	0.7150134	0.02984	0.00317	10.62%	0
Cam	0.02667	0.0333	-0.00663	0.00663	19.90417	0.8009009	0.02664	3E-05	0.11%	1

Tabla VI.6 Errores absolutos y relativos para el sitio Punto 3, zona offshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.05977	0.0761	-0.01633	0.01633	21.46364	0.78541393	0.063163	0.003393	5.37%	0
Van	0.05977	0.0781	-0.01833	0.01833	23.46765	0.7653009	0.064823	0.005053	7.80%	0
Sou	0.05977	0.07981	-0.02004	0.02004	25.10949	0.74890365	0.0662423	0.0064723	9.77%	0
Ahr	0.05977	0.07643	-0.01666	0.01666	21.79824	0.78202277	0.0634369	0.0036669	5.78%	0
Zan	0.05977	0.0781	-0.01833	0.01833	23.46765	0.7653009	0.064823	0.005053	7.80%	0
Jul	0.05977	0.07587	-0.0161	0.0161	21.21777	0.78779491	0.0629721	0.0032021	5.08%	0
Che	0.05977	0.07325	-0.01348	0.01348	18.40007	0.8159727	0.0607975	0.0010275	1.69%	1
Jim	0.05977	0.07709	-0.01732	0.01732	22.46583	0.77532754	0.0639847	0.0042147	6.59%	0
Rub	0.05977	0.07756	-0.01779	0.01779	22.94061	0.77062919	0.0643748	0.0046048	7.15%	0
Cha	0.05977	0.07843	-0.01866	0.01866	23.79674	0.76208084	0.0650969	0.0053269	8.18%	0
Swa	0.05977	0.09574	-0.03597	0.03597	37.57078	0.62429497	0.0794642	0.0196942	24.78%	0
Cam	0.05977	0.07185	-0.01208	0.01208	16.81194	0.83187196	0.0596355	0.0001345	0.23%	1

Tabla VI.7 Errores absolutos y relativos para el sitio Punto 4A, zona foreshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.01645	0.02582	-0.00937	0.00937	36.29428	0.63710302	0.018074	0.001624	8.99%	0
Van	0.01645	0.02663	-0.01018	0.01018	38.21776	0.61772437	0.018641	0.002191	11.75%	0
Sou	0.01645	0.02707	-0.01062	0.01062	39.22358	0.60768378	0.018949	0.002499	13.19%	0
Ahr	0.01645	0.02538	-0.00893	0.00893	35.19666	0.64814815	0.017766	0.001316	7.41%	0
Zan	0.01645	0.02663	-0.01018	0.01018	38.21776	0.61772437	0.018641	0.002191	11.75%	0
Jul	0.01645	0.02782	-0.01137	0.01137	40.87427	0.59130122	0.019474	0.003024	15.53%	0
Che	0.01645	0.02525	-0.0088	0.0088	34.84719	0.65148515	0.017675	0.001225	6.93%	0
Jim	0.01645	0.02489	-0.00844	0.00844	33.8964	0.660908	0.017423	0.000973	5.58%	0
Rub	0.01645	0.02465	-0.0082	0.0082	33.25812	0.6673428	0.017255	0.000805	4.67%	1
Cha	0.01645	0.02504	-0.00859	0.00859	34.31576	0.65694888	0.017528	0.001078	6.15%	0
Swa	0.01645	0.02362	-0.00717	0.00717	30.36159	0.69644369	0.016534	8.4E-05	0.51%	1
Cam	0.01645	0.02347	-0.00702	0.00702	29.9221	0.70089476	0.016429	2.1E-05	0.13%	1

Tabla VI.8 Errores absolutos y relativos para el sitio Punto 6, zona backshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.07143	0.06701	0.00442	0.00442	6.59679	1.0659603	0.06701	0.00442	6.60%	0
Van	0.07143	0.07106	0.00037	0.00037	0.52384	1.00520687	0.07106	0.00037	0.52%	1
Sou	0.07143	0.07259	-0.00116	0.00116	1.5931	0.98401984	0.07259	0.00116	1.60%	1
Ahr	0.07143	0.0681	0.00333	0.00333	4.8847	1.04889868	0.0681	0.00333	4.89%	1
Zan	0.07143	0.07106	0.00037	0.00037	0.52384	1.00520687	0.07106	0.00037	0.52%	1
Jul	0.07143	0.0694	0.00203	0.00203	2.92573	1.02925072	0.0694	0.00203	2.93%	1
Che	0.07143	0.06606	0.00537	0.00537	8.12175	1.08128974	0.06606	0.00537	8.13%	0
Jim	0.07143	0.06926	0.00217	0.00217	3.12712	1.03133122	0.06926	0.00217	3.13%	1
Rub	0.07143	0.06978	0.00165	0.00165	2.36519	1.02364574	0.06978	0.00165	2.36%	1
Cha	0.07143	0.07063	0.0008	0.0008	1.13162	1.01132663	0.07063	0.0008	1.13%	1
Swa	0.07143	0.08098	-0.00955	0.00955	11.79506	0.88206965	0.08098	0.00955	11.79%	0
Cam	0.07143	0.06466	0.00677	0.00677	10.4648	1.10470152	0.06466	0.00677	10.47%	0

Tabla VI.9 Errores absolutos y relativos para el sitio Punto 7, zona offshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.09575	0.12455	-0.0288	0.0288	23.12415	0.76876756	0.1158315	0.0200815	17.34%	0
Van	0.09575	0.10768	-0.01193	0.01193	11.07882	0.88920877	0.1001424	0.0043924	4.39%	1
Sou	0.09575	0.11016	-0.01441	0.01441	13.08398	0.86919027	0.1024488	0.0066988	6.54%	0
Ahr	0.09575	0.11696	-0.02121	0.02121	18.13689	0.81865595	0.1087728	0.0130228	11.97%	0
Zan	0.09575	0.10768	-0.01193	0.01193	11.07882	0.88920877	0.1001424	0.0043924	4.39%	1
Jul	0.09575	0.10306	-0.00731	0.00731	7.09408	0.92907044	0.0958458	9.58E-05	0.10%	1
Che	0.09575	0.10543	-0.00968	0.00968	9.17838	0.90818553	0.0980499	0.0022999	2.35%	1
Jim	0.09575	0.11129	-0.01554	0.01554	13.96725	0.86036481	0.1034997	0.0077497	7.49%	0
Rub	0.09575	0.13171	-0.03596	0.03596	27.30203	0.72697593	0.1224903	0.0267403	21.83%	0
Cha	0.09575	0.11125	-0.0155	0.0155	13.93277	0.86067416	0.1034625	0.0077125	7.45%	0
Swa	0.09575	0.16364	-0.06789	0.06789	41.48703	0.58512589	0.1521852	0.0564352	37.08%	0
Cam	0.09575	0.10566	-0.00991	0.00991	9.37841	0.90620859	0.0982638	0.0025138	2.56%	1

Tabla VI.10 Errores absolutos y relativos para el sitio Punto 9, zona foreshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.05999	0.07857	-0.01858	0.01858	23.64347	0.76352297	0.0636417	0.0036517	5.74%	0
Van	0.05999	0.08006	-0.02007	0.02007	25.06831	0.74931302	0.0648486	0.0048586	7.49%	0
Sou	0.05999	0.08182	-0.02183	0.02183	26.68102	0.73319482	0.0662742	0.0062842	9.48%	0
Ahr	0.05999	0.07869	-0.0187	0.0187	23.76625	0.76235862	0.0637389	0.0037489	5.88%	0
Zan	0.05999	0.08006	-0.02007	0.02007	25.06831	0.74931302	0.0648486	0.0048586	7.49%	0
Jul	0.05999	0.0777	-0.01771	0.01771	22.79271	0.77207207	0.062937	0.002947	4.68%	1
Che	0.05999	0.07522	-0.01523	0.01523	20.25231	0.79752725	0.0609282	0.0009382	1.54%	1
Jim	0.05999	0.07922	-0.01923	0.01923	24.27012	0.75725827	0.0641682	0.0041782	6.51%	0
Rub	0.05999	0.07968	-0.01969	0.01969	24.70756	0.75288655	0.0645408	0.0045508	7.05%	0
Cha	0.05999	0.08056	-0.02057	0.02057	25.53018	0.74466236	0.0652536	0.0052636	8.07%	0
Swa	0.05999	0.09915	-0.03916	0.03916	39.49593	0.60504286	0.0803115	0.0203215	25.30%	0
Cam	0.05999	0.0739	-0.01391	0.01391	18.81743	0.81177267	0.059859	0.000131	0.22%	1

Tabla VI.11 Errores absolutos y relativos para el sitio Punto 10, zona offshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.02009	0.02741	-0.00732	0.00732	26.71374	0.73294418	0.0216539	0.0015639	7.22%	0
Van	0.02009	0.02891	-0.00882	0.00882	30.51301	0.69491525	0.0228389	0.0027489	12.04%	0
Sou	0.02009	0.0294	-0.00931	0.00931	31.67266	0.68333333	0.023226	0.003136	13.50%	0
Ahr	0.02009	0.02722	-0.00713	0.00713	26.18872	0.73806025	0.0215038	0.0014138	6.57%	0
Zan	0.02009	0.02891	-0.00882	0.00882	30.51301	0.69491525	0.0228389	0.0027489	12.04%	0
Jul	0.02009	0.03003	-0.00994	0.00994	33.09733	0.66899767	0.0237237	0.0036337	15.32%	0
Che	0.02009	0.02718	-0.00709	0.00709	26.08235	0.73914643	0.0214722	0.0013822	6.44%	0
Jim	0.02009	0.02693	-0.00684	0.00684	25.40954	0.74600817	0.0212747	0.0011847	5.57%	0
Rub	0.02009	0.02674	-0.00665	0.00665	24.87485	0.7513089	0.0211246	0.0010346	4.90%	1
Cha	0.02009	0.02717	-0.00708	0.00708	26.06789	0.73941848	0.0214643	0.0013743	6.40%	0
Swa	0.02009	0.02551	-0.00542	0.00542	21.23356	0.7875343	0.0201529	6.29E-05	0.31%	1
Cam	0.02009	0.02534	-0.00525	0.00525	20.72067	0.79281768	0.0200186	7.14E-05	0.36%	1

Tabla VI.12 Errores absolutos y relativos para el sitio Punto B, zona foreshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.01259	0.01989	-0.0073	0.0073	36.69699	0.6329814	0.0149175	0.0023275	15.60%	0
Van	0.01259	0.0184	-0.00581	0.00581	31.58391	0.68423913	0.0138	0.00121	8.77%	0
Sou	0.01259	0.01868	-0.00609	0.00609	32.60597	0.67398287	0.01401	0.00142	10.14%	0
Ahr	0.01259	0.01863	-0.00604	0.00604	32.41245	0.67579173	0.0139725	0.0013825	9.89%	0
Zan	0.01259	0.0184	-0.00581	0.00581	31.58391	0.68423913	0.0138	0.00121	8.77%	0
Jul	0.01259	0.01963	-0.00704	0.00704	35.84772	0.64136526	0.0147225	0.0021325	14.48%	0
Che	0.01259	0.01815	-0.00556	0.00556	30.65036	0.69366391	0.0136125	0.0010225	7.51%	0
Jim	0.01259	0.01757	-0.00498	0.00498	28.35784	0.71656232	0.0131775	0.0005875	4.46%	1
Rub	0.01259	0.01724	-0.00465	0.00465	26.98008	0.73027842	0.01293	0.00034	2.63%	1
Cha	0.01259	0.01751	-0.00492	0.00492	28.09247	0.7190177	0.0131325	0.0005425	4.13%	1
Swa	0.01259	0.01731	-0.00472	0.00472	27.2694	0.72732525	0.0129825	0.0003925	3.02%	1
Cam	0.01259	0.01668	-0.00409	0.00409	24.53543	0.75479616	0.01251	8E-05	0.64%	1

Tabla VI.13 Errores absolutos y relativos para el sitio Punto D, zona backshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.04496	0.03868	0.00628	0.00628	16.22567	1.16235781	0.03868	0.00628	16.24%	0
Van	0.04496	0.04327	0.00169	0.00169	3.8944	1.03905708	0.04327	0.00169	3.91%	1
Sou	0.04496	0.04409	0.00087	0.00087	1.96279	1.01973237	0.04409	0.00087	1.97%	1
Ahr	0.04496	0.03958	0.00538	0.00538	13.58572	1.13592724	0.03958	0.00538	13.59%	0
Zan	0.04496	0.04327	0.00169	0.00169	3.8944	1.03905708	0.04327	0.00169	3.91%	1
Jul	0.04496	0.04373	0.00123	0.00123	2.80692	1.02812714	0.04373	0.00123	2.81%	1
Che	0.04496	0.03972	0.00524	0.00524	13.19814	1.13192346	0.03972	0.00524	13.19%	0
Jim	0.04496	0.04037	0.00459	0.00459	11.37861	1.11369829	0.04037	0.00459	11.37%	0
Rub	0.04496	0.04047	0.00449	0.00449	11.10421	1.11094638	0.04047	0.00449	11.09%	0
Cha	0.04496	0.04109	0.00387	0.00387	9.40738	1.0941835	0.04109	0.00387	9.42%	0
Swa	0.04496	0.03936	0.0056	0.0056	14.23828	1.14227642	0.03936	0.0056	14.23%	0
Cam	0.04496	0.03773	0.00723	0.00723	19.15684	1.1916247	0.03773	0.00723	19.16%	0

Tabla VI.14 Errores absolutos y relativos para el sitio Punto E, zona offshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.03619	0.03901	-0.00282	0.00282	7.22384	0.92771084	0.0370595	0.0008695	2.35%	1
Van	0.03619	0.04372	-0.00753	0.00753	17.22951	0.82776761	0.041534	0.005344	12.87%	0
Sou	0.03619	0.04456	-0.00837	0.00837	18.78497	0.81216338	0.042332	0.006142	14.51%	0
Ahr	0.03619	0.03999	-0.0038	0.0038	9.49593	0.90497624	0.0379905	0.0018005	4.74%	1
Zan	0.03619	0.04372	-0.00753	0.00753	17.22951	0.82776761	0.041534	0.005344	12.87%	0
Jul	0.03619	0.04406	-0.00787	0.00787	17.86454	0.82137994	0.041857	0.005667	13.54%	0
Che	0.03619	0.04009	-0.0039	0.0039	9.72868	0.90271888	0.0380855	0.0018955	4.98%	1
Jim	0.03619	0.04085	-0.00466	0.00466	11.41595	0.88592411	0.0388075	0.0026175	6.74%	0
Rub	0.03619	0.04099	-0.0048	0.0048	11.70666	0.88289827	0.0389405	0.0027505	7.06%	0
Cha	0.03619	0.04162	-0.00543	0.00543	13.04264	0.86953388	0.039539	0.003349	8.47%	0
Swa	0.03619	0.0402	-0.00401	0.00401	9.9662	0.90024876	0.03819	0.002	5.24%	0
Cam	0.03619	0.03821	-0.00202	0.00202	5.28801	0.94713426	0.0362995	0.0001095	0.30%	1

Tabla VI.15 Errores absolutos y relativos para el sitio Punto G, zona backshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.025	0.02989	-0.00489	0.00489	16.37196	0.83640013	0.0263032	0.0013032	4.95%	1
Van	0.025	0.03223	-0.00723	0.00723	22.4427	0.77567484	0.0283624	0.0033624	11.86%	0
Sou	0.025	0.0328	-0.0078	0.0078	23.775	0.76219512	0.028864	0.003864	13.39%	0
Ahr	0.025	0.02998	-0.00498	0.00498	16.61657	0.83388926	0.0263824	0.0013824	5.24%	0
Zan	0.025	0.03223	-0.00723	0.00723	22.4427	0.77567484	0.0283624	0.0033624	11.86%	0
Jul	0.025	0.03324	-0.00824	0.00824	24.79067	0.7521059	0.0292512	0.0042512	14.53%	0
Che	0.025	0.03004	-0.00504	0.00504	16.77744	0.8322237	0.0264352	0.0014352	5.43%	0
Jim	0.025	0.02996	-0.00496	0.00496	16.56326	0.83444593	0.0263648	0.0013648	5.18%	0
Rub	0.025	0.02983	-0.00483	0.00483	16.1969	0.83808247	0.0262504	0.0012504	4.76%	1
Cha	0.025	0.03031	-0.00531	0.00531	17.52468	0.82481029	0.0266728	0.0016728	6.27%	0
Swa	0.025	0.02895	-0.00395	0.00395	13.63998	0.86355786	0.025476	0.000476	1.87%	1
Cam	0.025	0.02825	-0.00325	0.00325	11.51827	0.88495575	0.02486	0.00014	0.56%	1

Tabla VI.16 Errores absolutos y relativos para el sitio Isla Mujeres, zona offshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.01832	0.02991	-0.01159	0.01159	38.75476	0.61250418	0.0194415	0.0011215	5.77%	0
Van	0.01832	0.03254	-0.01422	0.01422	43.69627	0.56299939	0.021151	0.002831	13.38%	0
Sou	0.01832	0.03311	-0.01479	0.01479	44.67655	0.55330716	0.0215215	0.0032015	14.88%	0
Ahr	0.01832	0.03013	-0.01181	0.01181	39.18803	0.60803186	0.0195845	0.0012645	6.46%	0
Zan	0.01832	0.03254	-0.01422	0.01422	43.69627	0.56299939	0.021151	0.002831	13.38%	0
Jul	0.01832	0.03344	-0.01512	0.01512	45.21667	0.54784689	0.021736	0.003416	15.72%	0
Che	0.01832	0.03022	-0.0119	0.0119	39.37171	0.60622105	0.019643	0.001323	6.74%	0
Jim	0.01832	0.03023	-0.01191	0.01191	39.40267	0.60602051	0.0196495	0.0013295	6.77%	0
Rub	0.01832	0.03014	-0.01182	0.01182	39.2121	0.60783013	0.019591	0.001271	6.49%	0
Cha	0.01832	0.03062	-0.0123	0.0123	40.17243	0.59830176	0.019903	0.001583	7.95%	0
Swa	0.01832	0.03034	-0.01202	0.01202	39.6154	0.60382334	0.019721	0.001401	7.10%	0
Cam	0.01832	0.0283	-0.00998	0.00998	35.25838	0.64734982	0.018395	7.5E-05	0.41%	1

Tabla VI.17 Errores absolutos y relativos para el sitio Tulum B, zona foreshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.01931	0.02687	-0.00756	0.00756	28.14041	0.71864533	0.0228395	0.0035295	15.45%	0
Van	0.01931	0.02838	-0.00907	0.00907	31.96663	0.68040874	0.024123	0.004813	19.95%	0
Sou	0.01931	0.02887	-0.00956	0.00956	33.10403	0.66886041	0.0245395	0.0052295	21.31%	0
Ahr	0.01931	0.0267	-0.00739	0.00739	27.67344	0.72322097	0.022695	0.003385	14.92%	0
Zan	0.01931	0.02838	-0.00907	0.00907	31.96663	0.68040874	0.024123	0.004813	19.95%	0
Jul	0.01931	0.02947	-0.01016	0.01016	34.46841	0.65524262	0.0250495	0.0057395	22.91%	0
Che	0.01931	0.02667	-0.00736	0.00736	27.58693	0.7240345	0.0226695	0.0033595	14.82%	0
Jim	0.01931	0.02644	-0.00713	0.00713	26.95644	0.73033283	0.022474	0.003164	14.08%	0
Rub	0.01931	0.02625	-0.00694	0.00694	26.44553	0.73561905	0.0223125	0.0030025	13.46%	0
Cha	0.01931	0.02668	-0.00737	0.00737	27.61363	0.72376312	0.022678	0.003368	14.85%	0
Swa	0.01931	0.02349	-0.00418	0.00418	17.80724	0.82205194	0.0199665	0.0006565	3.29%	1
Cam	0.01931	0.02279	-0.00348	0.00348	15.28211	0.84730145	0.0193715	6.15E-05	0.32%	1

Tabla VI.18 Errores absolutos y relativos para el sitio Bahía Príncipe, zona backshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.05358	0.06601	-0.01242	0.01242	18.81918	0.8116952	0.0613893	0.0078093	12.72%	0
Van	0.05358	0.06972	-0.01613	0.01613	23.13845	0.76850258	0.0648396	0.0112596	17.37%	0
Sou	0.05358	0.07122	-0.01763	0.01763	24.76136	0.75231676	0.0662346	0.0126546	19.11%	0
Ahr	0.05358	0.06699	-0.01341	0.01341	20.0127	0.79982087	0.0623007	0.0087207	14.00%	0
Zan	0.05358	0.06972	-0.01613	0.01613	23.13845	0.76850258	0.0648396	0.0112596	17.37%	0
Jul	0.05358	0.06804	-0.01445	0.01445	21.24235	0.78747795	0.0632772	0.0096972	15.32%	0
Che	0.05358	0.06489	-0.0113	0.0113	17.4183	0.82570504	0.0603477	0.0067677	11.21%	0
Jim	0.05358	0.06807	-0.01448	0.01448	21.27883	0.78713089	0.0633051	0.0097251	15.36%	0
Rub	0.05358	0.06857	-0.01498	0.01498	21.85136	0.78139128	0.0637701	0.0101901	15.98%	0
Cha	0.05358	0.06939	-0.01581	0.01581	22.78352	0.77215737	0.0645327	0.0109527	16.97%	0
Swa	0.05358	0.07116	-0.01758	0.01758	24.69951	0.7529511	0.0661788	0.0125988	19.04%	0
Cam	0.05358	0.05751	-0.00393	0.00393	6.83416	0.93166406	0.0534843	9.57E-05	0.18%	1

Tabla VI.19 Errores absolutos y relativos para el sitio Akumal 1, zona offshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.01076	0.01578	-0.00502	0.00502	31.8078	0.68187579	0.0137286	0.0029686	21.62%	0
Van	0.01076	0.01338	-0.00262	0.00262	19.57707	0.80418535	0.0116406	0.0008806	7.56%	0
Sou	0.01076	0.01357	-0.00281	0.00281	20.72332	0.79292557	0.0118059	0.0010459	8.86%	0
Ahr	0.01076	0.01413	-0.00337	0.00337	23.84914	0.76150035	0.0122931	0.0015331	12.47%	0
Zan	0.01076	0.01338	-0.00262	0.00262	19.57707	0.80418535	0.0116406	0.0008806	7.56%	0
Jul	0.01076	0.01442	-0.00366	0.00366	25.40026	0.74618585	0.0125454	0.0017854	14.23%	0
Che	0.01076	0.01359	-0.00283	0.00283	20.82641	0.79175865	0.0118233	0.0010633	8.99%	0
Jim	0.01076	0.01303	-0.00227	0.00227	17.4301	0.82578665	0.0113361	0.0005761	5.08%	0
Rub	0.01076	0.01271	-0.00195	0.00195	15.32941	0.8465775	0.0110577	0.0002977	2.69%	1
Cha	0.01076	0.01289	-0.00213	0.00213	16.55491	0.83475562	0.0112143	0.0004543	4.05%	1
Swa	0.01076	0.01304	-0.00228	0.00228	17.5053	0.82515337	0.0113448	0.0005848	5.15%	0
Cam	0.01076	0.0124	-0.00164	0.00164	13.1919	0.86774194	0.010788	2.8E-05	0.26%	1

Tabla VI.20 Errores absolutos y relativos para el sitio Playa del Carmen 2, zona foreshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.03234	0.03586	-0.00351	0.00351	9.79221	0.90184049	0.0337084	0.0013684	4.06%	1
Van	0.03234	0.03994	-0.0076	0.0076	19.02206	0.80971457	0.0375436	0.0052036	13.86%	0
Sou	0.03234	0.04069	-0.00834	0.00834	20.50454	0.79478987	0.0382486	0.0059086	15.45%	0
Ahr	0.03234	0.03658	-0.00423	0.00423	11.57344	0.88408967	0.0343852	0.0020452	5.95%	0
Zan	0.03234	0.03994	-0.0076	0.0076	19.02206	0.80971457	0.0375436	0.0052036	13.86%	0
Jul	0.03234	0.04053	-0.00818	0.00818	20.19155	0.79792746	0.0380982	0.0057582	15.11%	0
Che	0.03234	0.03673	-0.00439	0.00439	11.939	0.88047917	0.0345262	0.0021862	6.33%	0
Jim	0.03234	0.03719	-0.00484	0.00484	13.0258	0.8695886	0.0349586	0.0026186	7.49%	0
Rub	0.03234	0.03723	-0.00489	0.00489	13.13271	0.86865431	0.0349962	0.0026562	7.59%	0
Cha	0.03234	0.03782	-0.00547	0.00547	14.47443	0.85510312	0.0355508	0.0032108	9.03%	0
Swa	0.03234	0.03534	-0.00299	0.00299	8.46386	0.91511036	0.0332196	0.0008796	2.65%	1
Cam	0.03234	0.03436	-0.00202	0.00202	5.87132	0.94121071	0.0322984	4.16E-05	0.13%	1

Tabla VI.21 Errores absolutos y relativos para el sitio Punta Allen, zona backshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.0206	0.02875	-0.00815	0.00815	28.36024	0.71652174	0.02185	0.00125	5.72%	0
Van	0.0206	0.03109	-0.01049	0.01049	33.74673	0.66259247	0.0236284	0.0030284	12.82%	0
Sou	0.0206	0.03164	-0.01104	0.01104	34.88957	0.65107459	0.0240464	0.0034464	14.33%	0
Ahr	0.0206	0.02888	-0.00828	0.00828	28.66388	0.7132964	0.0219488	0.0013488	6.15%	0
Zan	0.0206	0.03109	-0.01049	0.01049	33.74673	0.66259247	0.0236284	0.0030284	12.82%	0
Jul	0.0206	0.03203	-0.01143	0.01143	35.68598	0.64314705	0.0243428	0.0037428	15.38%	0
Che	0.0206	0.02894	-0.00834	0.00834	28.82785	0.71181755	0.0219944	0.0013944	6.34%	0
Jim	0.0206	0.0289	-0.0083	0.0083	28.71207	0.71280277	0.021964	0.001364	6.21%	0
Rub	0.0206	0.02878	-0.00818	0.00818	28.42665	0.71577484	0.0218728	0.0012728	5.82%	0
Cha	0.0206	0.02924	-0.00864	0.00864	29.55979	0.70451436	0.0222224	0.0016224	7.30%	0
Swa	0.0206	0.02801	-0.00741	0.00741	26.44964	0.73545162	0.0212876	0.0006876	3.23%	1
Cam	0.0206	0.02724	-0.00664	0.00664	24.38936	0.75624082	0.0207024	0.0001024	0.49%	1

Tabla VI.22 Errores absolutos y relativos para el sitio Holbox, zona offshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.01044	0.01431	-0.00387	0.00387	27.05122	0.72955975	0.0133083	0.0028683	21.55%	0
Van	0.01044	0.01194	-0.0015	0.0015	12.56051	0.87437186	0.0111042	0.0006642	5.98%	0
Sou	0.01044	0.01211	-0.00167	0.00167	13.77735	0.86209744	0.0112623	0.0008223	7.30%	0
Ahr	0.01044	0.0129	-0.00246	0.00246	19.04259	0.80930233	0.011997	0.001557	12.98%	0
Zan	0.01044	0.01194	-0.0015	0.0015	12.56051	0.87437186	0.0111042	0.0006642	5.98%	0
Jul	0.01044	0.01294	-0.0025	0.0025	19.32954	0.80680062	0.0120342	0.0015942	13.25%	0
Che	0.01044	0.01234	-0.0019	0.0019	15.43039	0.84602917	0.0114762	0.0010362	9.03%	0
Jim	0.01044	0.01178	-0.00134	0.00134	11.38518	0.88624788	0.0109554	0.0005154	4.70%	1
Rub	0.01044	0.01439	-0.00395	0.00395	27.45649	0.72550382	0.0133827	0.0029427	21.99%	0
Cha	0.01044	0.01161	-0.00117	0.00117	10.07835	0.89922481	0.0107973	0.0003573	3.31%	1
Swa	0.01044	0.01191	-0.00147	0.00147	12.3121	0.87657431	0.0110763	0.0006363	5.74%	0
Cam	0.01044	0.01121	-0.00077	0.00077	6.88148	0.93131133	0.0104253	1.47E-05	0.14%	1

Tabla VI.23 Errores absolutos y relativos para el sitio Telchac, zona backshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.03324	0.05676	-0.02352	0.02352	41.43625	0.58562368	0.0346236	0.0013836	4.00%	1
Van	0.03324	0.06186	-0.02862	0.02862	46.26623	0.53734239	0.0377346	0.0044946	11.91%	0
Sou	0.03324	0.06316	-0.02992	0.02992	47.37198	0.52628246	0.0385276	0.0052876	13.72%	0
Ahr	0.03324	0.05819	-0.02494	0.02494	42.86844	0.57123217	0.0354959	0.0022559	6.36%	0
Zan	0.03324	0.06186	-0.02862	0.02862	46.26623	0.53734239	0.0377346	0.0044946	11.91%	0
Jul	0.03324	0.06082	-0.02758	0.02758	45.34258	0.54653075	0.0371002	0.0038602	10.40%	0
Che	0.03324	0.05709	-0.02384	0.02384	41.76763	0.58223857	0.0348249	0.0015849	4.55%	1
Jim	0.03324	0.05953	-0.02628	0.02628	44.15493	0.55837393	0.0363133	0.0030733	8.46%	0
Rub	0.03324	0.05999	-0.02675	0.02675	44.58701	0.55409235	0.0365939	0.0033539	9.17%	0
Cha	0.03324	0.06078	-0.02754	0.02754	45.30699	0.54689042	0.0370758	0.0038358	10.35%	0
Swa	0.03324	0.06258	-0.02934	0.02934	46.88205	0.53116012	0.0381738	0.0049338	12.92%	0
Cam	0.03324	0.05461	-0.02137	0.02137	39.13018	0.60867973	0.0333121	7.21E-05	0.22%	1

Tabla VI.24 Errores absolutos y relativos para el sitio UAY, zona foreshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.06003	0.07837	-0.01834	0.01834	23.40588	0.76598188	0.0642634	0.0042334	6.59%	0
Van	0.06003	0.07906	-0.01903	0.01903	24.07286	0.75929674	0.0648292	0.0047992	7.40%	0
Sou	0.06003	0.08081	-0.02078	0.02078	25.71406	0.74285361	0.0662642	0.0062342	9.41%	0
Ahr	0.06003	0.0782	-0.01817	0.01817	23.23291	0.76764706	0.064124	0.004094	6.38%	0
Zan	0.06003	0.07906	-0.01903	0.01903	24.07286	0.75929674	0.0648292	0.0047992	7.40%	0
Jul	0.06003	0.07664	-0.01661	0.01661	21.66802	0.78327244	0.0628448	0.0028148	4.48%	1
Che	0.06003	0.07448	-0.01445	0.01445	19.40238	0.80598818	0.0610736	0.0010436	1.71%	1
Jim	0.06003	0.07849	-0.01846	0.01846	23.51919	0.7648108	0.0643618	0.0043318	6.73%	0
Rub	0.06003	0.0789	-0.01887	0.01887	23.91986	0.7608365	0.064698	0.004668	7.22%	0
Cha	0.06003	0.07975	-0.01972	0.01972	24.73155	0.75272727	0.065395	0.005365	8.20%	0
Swa	0.06003	0.09455	-0.03452	0.03452	36.50847	0.63490217	0.077531	0.017501	22.57%	0
Cam	0.06003	0.07338	-0.01335	0.01335	18.19839	0.81807032	0.0601716	0.0001416	0.24%	1

Tabla VI.25 Errores absolutos y relativos para el sitio ECCA, zona offshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.02349	0.02866	-0.00517	0.00517	18.03861	0.81960921	0.02866	0.00517	18.04%	0
Van	0.02349	0.03067	-0.00718	0.00718	23.4011	0.76589501	0.03067	0.00718	23.41%	0
Sou	0.02349	0.0312	-0.00771	0.00771	24.70288	0.75288462	0.0312	0.00771	24.71%	0
Ahr	0.02349	0.02864	-0.00515	0.00515	17.98696	0.82018156	0.02864	0.00515	17.98%	0
Zan	0.02349	0.03067	-0.00718	0.00718	23.4011	0.76589501	0.03067	0.00718	23.41%	0
Jul	0.02349	0.03171	-0.00822	0.00822	25.91826	0.74077578	0.03171	0.00822	25.92%	0
Che	0.02349	0.02867	-0.00518	0.00518	18.05563	0.81932333	0.02867	0.00518	18.07%	0
Jim	0.02349	0.02852	-0.00503	0.00503	17.64471	0.82363254	0.02852	0.00503	17.64%	0
Rub	0.02349	0.02837	-0.00488	0.00488	17.19942	0.82798731	0.02837	0.00488	17.20%	0
Cha	0.02349	0.02883	-0.00534	0.00534	18.51325	0.81477627	0.02883	0.00534	18.52%	0
Sw	0.02349	0.02046	0.00303	0.00303	14.81587	1.14809384	0.02046	0.00303	14.81%	0
Cam	0.02349	0.01365	0.00984	0.00984	72.13209	1.72087912	0.01365	0.00984	72.09%	0

Tabla VI.26 Errores absolutos y relativos para el sitio Progreso, zona offshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.02678	0.01925	0.00753	0.00753	39.11914	1.39116883	0.01925	0.00753	39.12%	0
Van	0.02678	0.01767	0.00912	0.00912	51.6022	1.5155631	0.01767	0.00911	51.56%	0
Sou	0.02678	0.01793	0.00885	0.00885	49.34896	1.49358617	0.01793	0.00885	49.36%	0
Ahr	0.02678	0.01796	0.00882	0.00882	49.11964	1.49109131	0.01796	0.00882	49.11%	0
Zan	0.02678	0.01767	0.00912	0.00912	51.6022	1.5155631	0.01767	0.00911	51.56%	0
Jul	0.02678	0.01886	0.00792	0.00792	41.98583	1.41993637	0.01886	0.00792	41.99%	0
Che	0.02678	0.01748	0.0093	0.0093	53.23092	1.53203661	0.01748	0.0093	53.20%	0
Jim	0.02678	0.0169	0.00988	0.00988	58.46103	1.58461538	0.0169	0.00988	58.46%	0
Rub	0.02678	0.01657	0.01021	0.01021	61.60827	1.61617381	0.01657	0.01021	61.62%	0
Cha	0.02678	0.01683	0.00996	0.00996	59.15675	1.59120618	0.01683	0.00995	59.12%	0
Sw	0.02678	0.01638	0.01041	0.01041	63.5255	1.63492063	0.01638	0.0104	63.49%	0
Cam	0.02678	0.01604	0.01075	0.01075	67.00111	1.66957606	0.01604	0.01074	66.96%	0

Tabla VI.27 Errores absolutos y relativos para el sitio Carissa Palma, zona backshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.05457	0.05096	0.00361	0.00361	7.09093	1.07083987	0.05096	0.00361	7.08%	0
Van	0.05457	0.05659	-0.00202	0.00202	3.56683	0.96430465	0.05659	0.00202	3.57%	1
Sou	0.05457	0.05775	-0.00318	0.00318	5.49899	0.94493506	0.05775	0.00318	5.51%	0
Ahr	0.05457	0.05245	0.00212	0.00212	4.04955	1.04041945	0.05245	0.00212	4.04%	1
Zan	0.05457	0.05659	-0.00202	0.00202	3.56683	0.96430465	0.05659	0.00202	3.57%	1
Jul	0.05457	0.05605	-0.00148	0.00148	2.63717	0.973595	0.05605	0.00148	2.64%	1
Che	0.05457	0.05195	0.00262	0.00262	5.04465	1.05043311	0.05195	0.00262	5.04%	0
Jim	0.05457	0.05381	0.00076	0.00076	1.41604	1.01412377	0.05381	0.00076	1.41%	1
Rub	0.05457	0.05419	0.00038	0.00038	0.69571	1.00701236	0.05419	0.00038	0.70%	1
Cha	0.05457	0.05495	-0.00038	0.00038	0.69773	0.99308462	0.05495	0.00038	0.69%	1
Sw	0.05457	0.05663	-0.00206	0.00206	3.63555	0.96362352	0.05663	0.00206	3.64%	1
Cam	0.05457	0.05031	0.00426	0.00426	8.46407	1.08467501	0.05031	0.00426	8.47%	0

Tabla VI.28 Errores absolutos y relativos para el sitio Hilton, zona foreshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.08825	0.09057	-0.00232	0.00232	2.55741	0.97438445	0.09057	0.00232	2.56%	1
Van	0.08825	0.08786	0.00039	0.00039	0.4427	1.00443888	0.08786	0.00039	0.44%	1
Sou	0.08825	0.08983	-0.00158	0.00158	1.7588	0.98241122	0.08983	0.00158	1.76%	1
Ahr	0.08825	0.089	-0.00075	0.00075	0.84364	0.99157303	0.089	0.00075	0.84%	1
Zan	0.08825	0.08786	0.00039	0.00039	0.4427	1.00443888	0.08786	0.00039	0.44%	1
Jul	0.08825	0.08481	0.00344	0.00344	4.0501	1.04056125	0.08481	0.00344	4.06%	1
Che	0.08825	0.08358	0.00467	0.00467	5.58856	1.05587461	0.08358	0.00467	5.59%	0
Jim	0.08825	0.08824	0.00001	0.00001	0.0064	1.00011333	0.08824	1E-05	0.01%	1
Rub	0.08825	0.08849	-0.00024	0.00024	0.27479	0.99728783	0.08849	0.00024	0.27%	1
Cha	0.08825	0.08936	-0.00111	0.00111	1.2472	0.98757833	0.08936	0.00111	1.24%	1
Sw	0.08825	0.11566	-0.02741	0.02741	23.69692	0.76301228	0.11566	0.02741	23.70%	0
Cam	0.08825	0.08287	0.00538	0.00538	6.48907	1.06492096	0.08287	0.00538	6.49%	0

Tabla VI.29 Errores absolutos y relativos para el sitio Royal Solaris, zona foreshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.0711	0.07953	-0.00843	0.00843	10.59819	0.89400226	0.0755535	0.0044535	5.89%	0
Van	0.0711	0.08041	-0.00931	0.00931	11.57715	0.88421838	0.0763895	0.0052895	6.92%	0
Sou	0.0711	0.08218	-0.01108	0.01108	13.48666	0.86517401	0.078071	0.006971	8.93%	0
Ahr	0.0711	0.07942	-0.00832	0.00832	10.47425	0.89524049	0.075449	0.004349	5.76%	0
Zan	0.0711	0.08041	-0.00931	0.00931	11.57715	0.88421838	0.0763895	0.0052895	6.92%	0
Jul	0.0711	0.07796	-0.00686	0.00686	8.80162	0.91200616	0.074062	0.002962	4.00%	1
Che	0.0711	0.07571	-0.00461	0.00461	6.08361	0.93910976	0.0719245	0.0008245	1.15%	1
Jim	0.0711	0.07977	-0.00867	0.00867	10.86696	0.89131252	0.0757815	0.0046815	6.18%	0
Rub	0.0711	0.0802	-0.0091	0.0091	11.34499	0.88653367	0.07619	0.00509	6.68%	0
Cha	0.0711	0.08107	-0.00997	0.00997	12.29588	0.87701986	0.0770165	0.0059165	7.68%	0
Swa	0.0711	0.09686	-0.02576	0.02576	26.59404	0.73404914	0.092017	0.020917	22.73%	0
Cam	0.0711	0.07474	-0.00364	0.00364	4.87627	0.95129783	0.071003	9.7E-05	0.14%	1

Tabla VI.30 Errores absolutos y relativos para el sitio Isla del Carmen, zona backshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.02452	0.02664	-0.00212	0.00212	7.94616	0.92042042	0.02664	0.00212	7.96%	0
Van	0.02452	0.02779	-0.00327	0.00327	11.76379	0.88233177	0.02779	0.00327	11.77%	0
Sou	0.02452	0.02826	-0.00374	0.00374	13.21818	0.86765747	0.02826	0.00374	13.23%	0
Ahr	0.02452	0.02632	-0.0018	0.0018	6.8392	0.93161094	0.02632	0.0018	6.84%	0
Zan	0.02452	0.02779	-0.00327	0.00327	11.76379	0.88233177	0.02779	0.00327	11.77%	0
Jul	0.02452	0.02896	-0.00443	0.00443	15.30315	0.84668508	0.02896	0.00444	15.33%	0
Che	0.02452	0.02624	-0.00171	0.00171	6.53181	0.93445122	0.02624	0.00172	6.55%	0
Jim	0.02452	0.02593	-0.00141	0.00141	5.42303	0.94562283	0.02593	0.00141	5.44%	0
Rub	0.02452	0.02571	-0.00119	0.00119	4.6285	0.95371451	0.02571	0.00119	4.63%	1
Cha	0.02452	0.02613	-0.0016	0.0016	6.14216	0.938385	0.02613	0.00161	6.16%	0
Swa	0.02452	0.02433	0.0002	0.0002	0.80594	1.00780929	0.02433	0.00019	0.78%	1
Cam	0.02452	0.0243	0.00023	0.00023	0.93761	1.0090535	0.0243	0.00022	0.91%	1

Tabla VI.31 Errores absolutos y relativos para el sitio Punta Xen, zona foreshore

Ecuacion	Wf_lab	Wf_Cal	Error	Eabs	Erel	FR	Wf con FR	Eabs	Erel	cual checa
Hal	0.01411	0.0207	-0.00659	0.00659	31.82146	0.68164251	0.016767	0.002657	15.85%	0
Van	0.01411	0.01948	-0.00537	0.00537	27.58346	0.72433265	0.0157788	0.0016688	10.58%	0
Sou	0.01411	0.01978	-0.00567	0.00567	28.67754	0.71334681	0.0160218	0.0019118	11.93%	0
Ahr	0.01411	0.01954	-0.00543	0.00543	27.79444	0.7221085	0.0158274	0.0017174	10.85%	0
Zan	0.01411	0.01948	-0.00537	0.00537	27.58346	0.72433265	0.0157788	0.0016688	10.58%	0
Jul	0.01411	0.02073	-0.00662	0.00662	31.91803	0.68065605	0.0167913	0.0026813	15.97%	0
Che	0.01411	0.01911	-0.005	0.005	26.14597	0.73835688	0.0154791	0.0013691	8.84%	0
Jim	0.01411	0.01854	-0.00443	0.00443	23.88037	0.76105717	0.0150174	0.0009074	6.04%	0
Rub	0.01411	0.01821	-0.0041	0.0041	22.52015	0.77484898	0.0147501	0.0006401	4.34%	1
Cha	0.01411	0.0185	-0.00439	0.00439	23.71052	0.7627027	0.014985	0.000875	5.84%	0
Swa	0.01411	0.01748	-0.00337	0.00337	19.27847	0.80720824	0.0141588	4.88E-05	0.34%	1
Cam	0.01411	0.01738	-0.00327	0.00327	18.81392	0.8118527	0.0140778	3.22E-05	0.23%	1