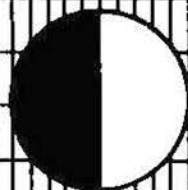


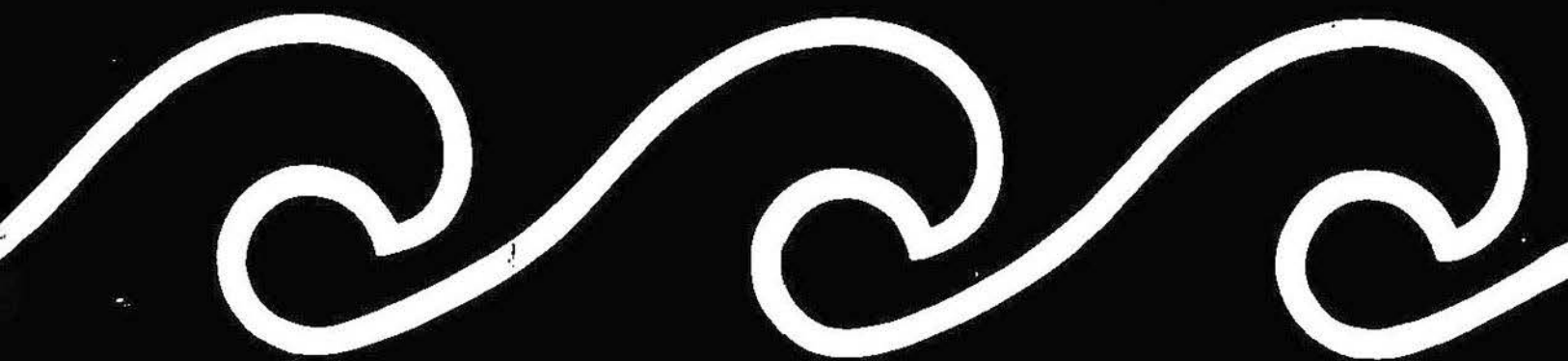
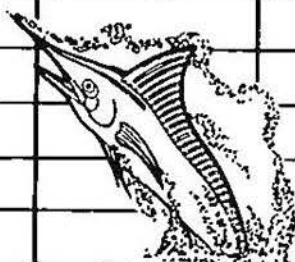
INSTITUTO DE GEOFISICA



de Mareas

Calendario Gráfico

1988



**Acapulco, Gro.
Puerto Angel, Oax.**

2209
A213
30

CALENDARIO GRAFICO DE MAREAS, 1988

ACAPULCO, GRO.

REGIMEN DE MAREAS:

El régimen de mareas para Acapulco es mixto, ocurren dos pleamares y dos bajamares en cada día de marea. Una característica muy especial de la marea en esta zona, es que las mareas Vivas o de Sicigias, no ocurren en Luna Nueva y Llena sino que éstas suceden en los cuartos menguante y Creciente; esto es debido a que las fases de las componentes de marea M_2 y S_2 (componente lunar principal semidiurna y componente solar principal semidiurna) se encuentran en oposición en Luna Nueva y Llena y sus amplitudes se compensan predominando los efectos diurnos, por ese motivo unos días antes y después de la Oposición y Conjunción de la Luna, la marea se convierte en diurna, es decir, ocurre una pleamar y una bajamar en cada día de marea. Lo contrario sucede en los Cuartos de la Luna en donde las fases de dichas componentes (M_2 y S_2) concuerdan y sus amplitudes se suman, provocándose las mareas máximas en esas fechas. El movimiento total de la marea se propaga desde Cabo Corrientes hacia el sur, disminuyendo la amplitud hacia Lázaro Cárdenas, Mich., lugar donde se registran las amplitudes de marea más pequeñas de la Costa del Pacífico de México, de ahí las amplitudes vuelven a crecer hasta alcanzar su valor máximo en el Golfo de Panamá (Balboa, Zona del Canal).

TIEMPO:

La hora usada para la predicción de mareas para Acapulco, Gro., es la del meridiano 90° W. Se cuentan desde las 00 horas que corresponden a la media noche.

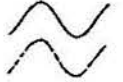
PLANO DE REFERENCIA:

El plano de referencia que está bajo el nivel medio del mar, al cual están referidas las alturas, es el nivel de bajamar media inferior = 1.0



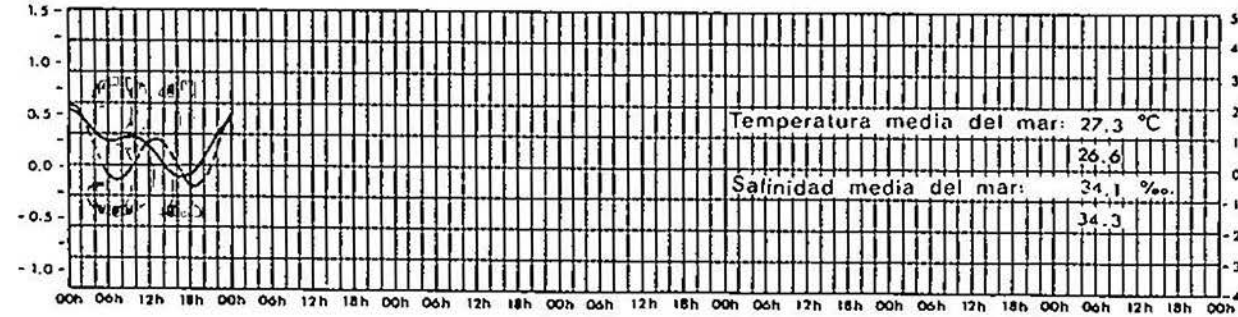
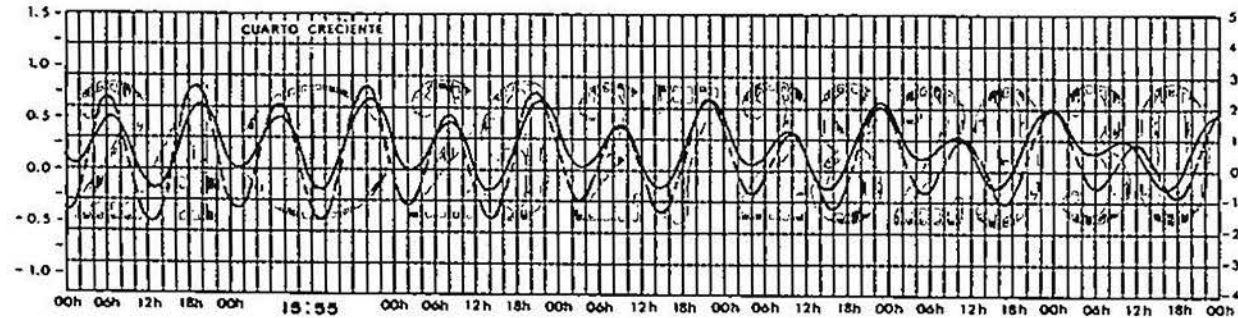
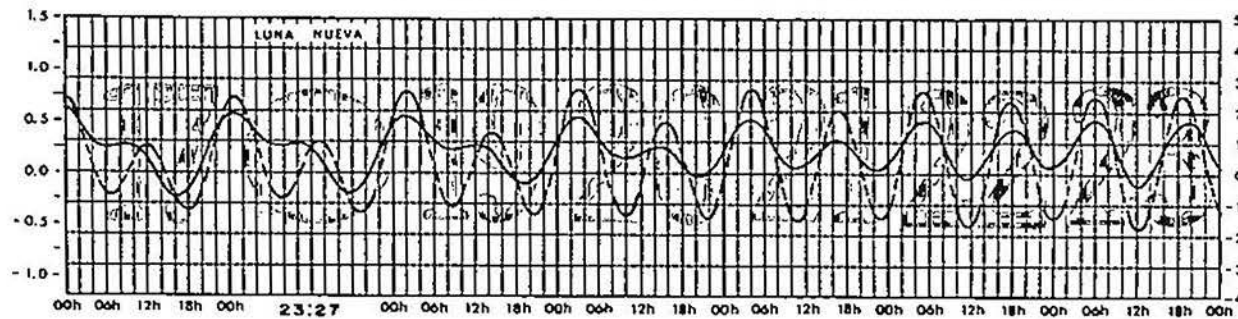
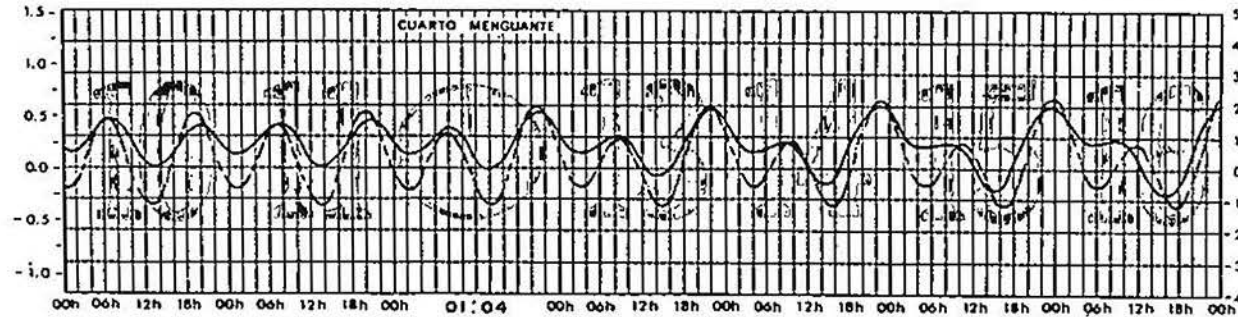
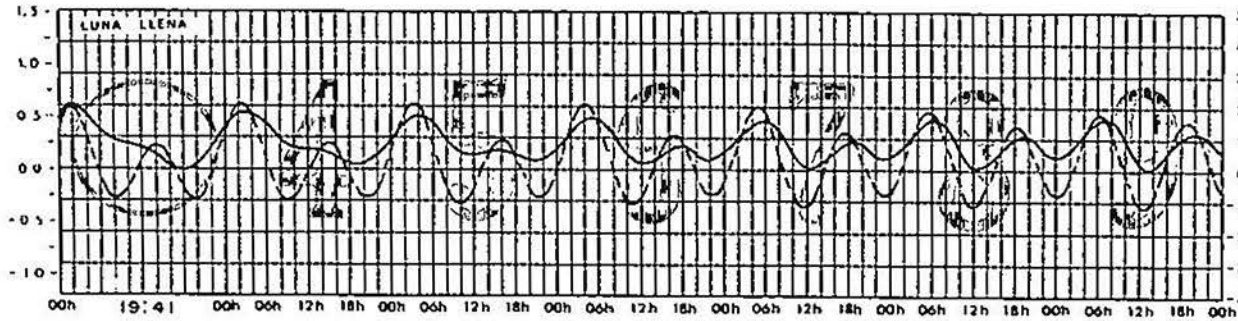
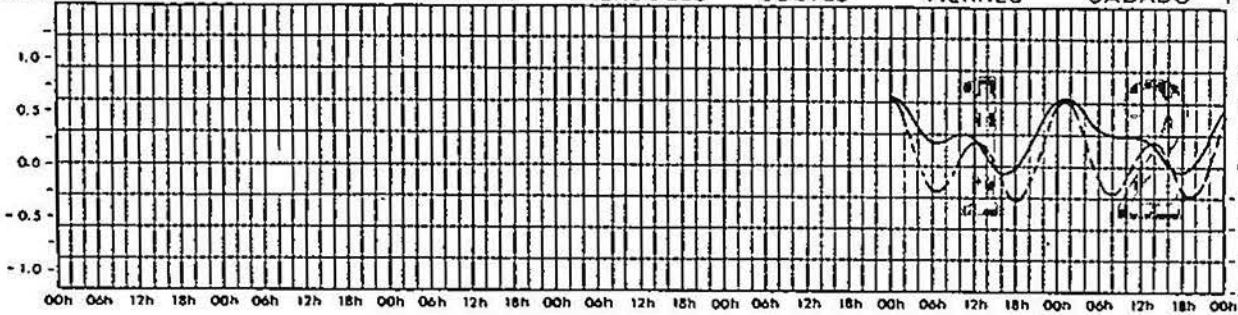
ENERO 1988

ACAPULCO, GRO.
PTO. ANGEL, OAX.



INSTITUTO DE GEOFISICA, U. N. A. M.

Metros DOMINGO LUNES MARTES MIERCOLES JUEVES VIERNES SABADO Pies



HORA DEL MERIDIANO 90°W

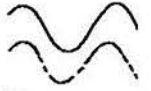
PLANO DE REFERENCIA I. N. G. M. S.

4213-43
(1-2)

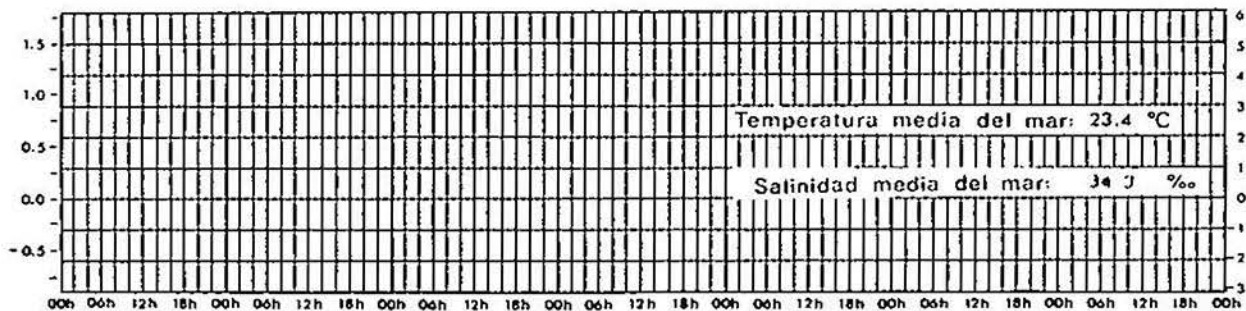
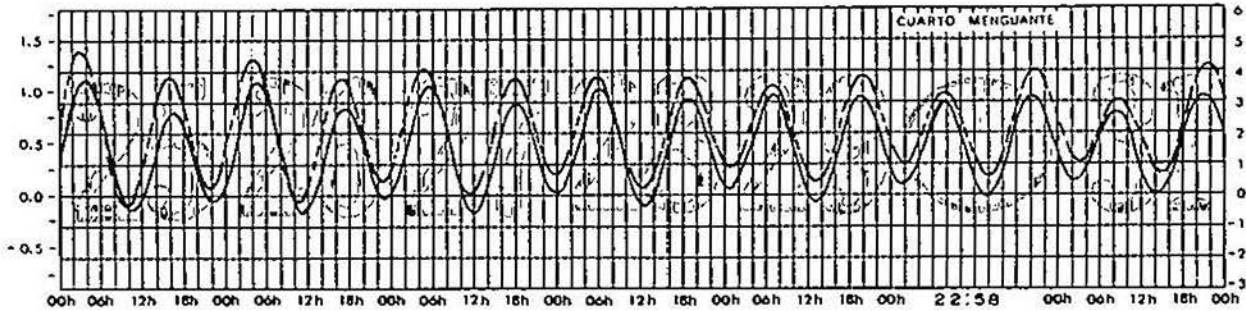
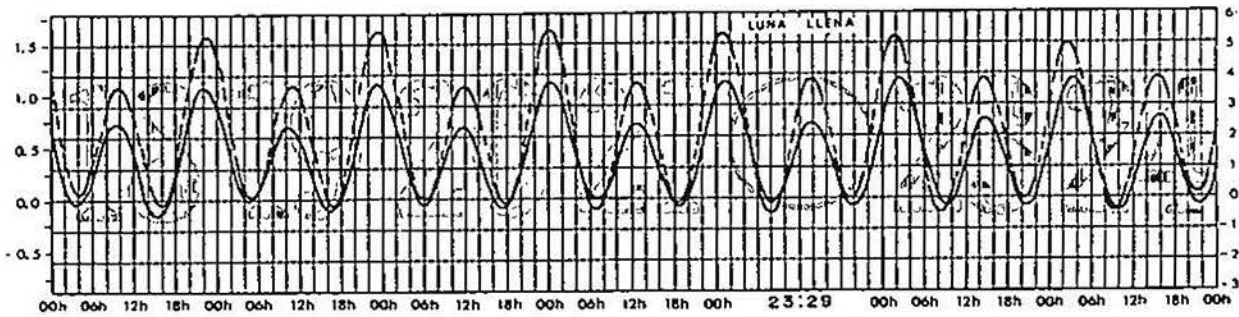
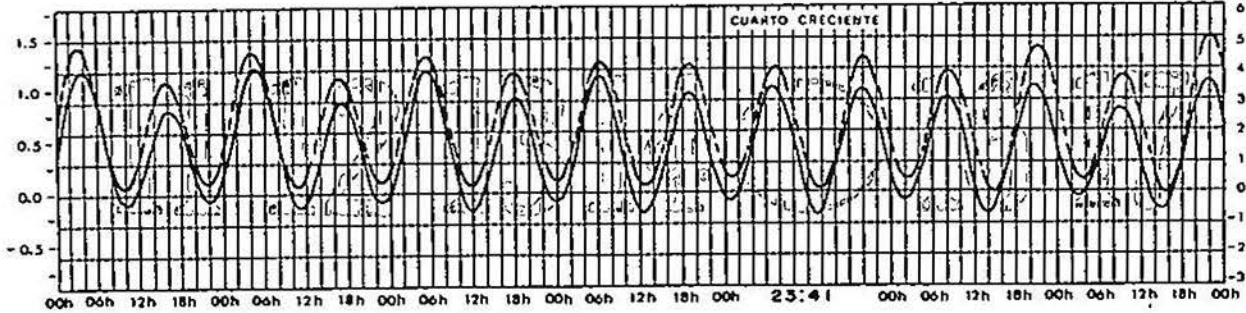
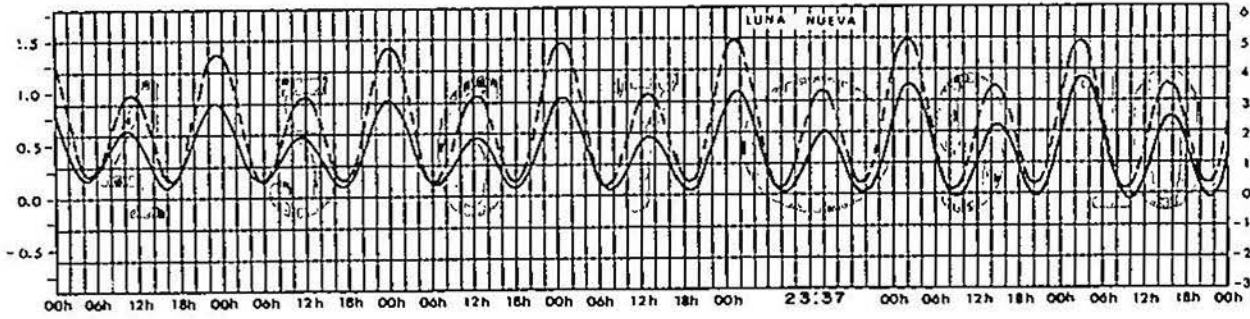
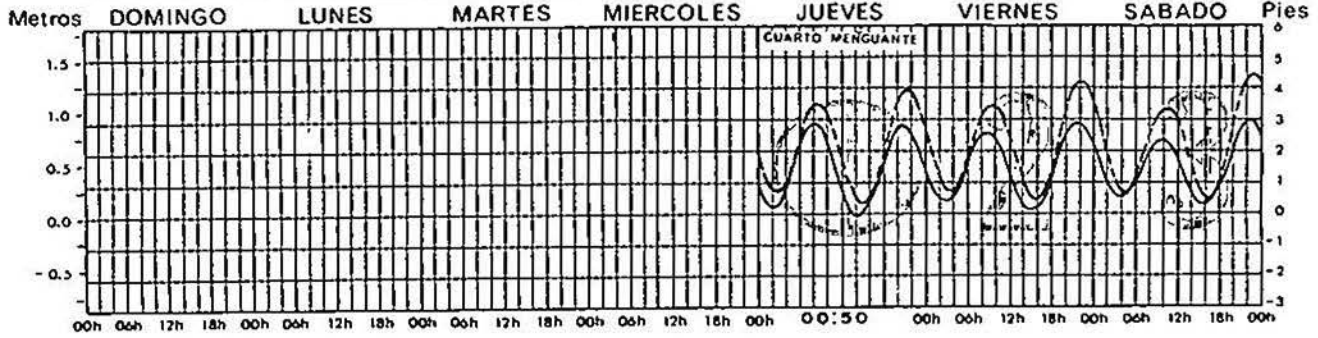


DICIEMBRE 1988

SALINA CRUZ, OAX.
PUERTO MADERO, CHIS.



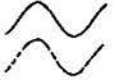
INSTITUTO DE GEOFISICA, U. N. A. M.





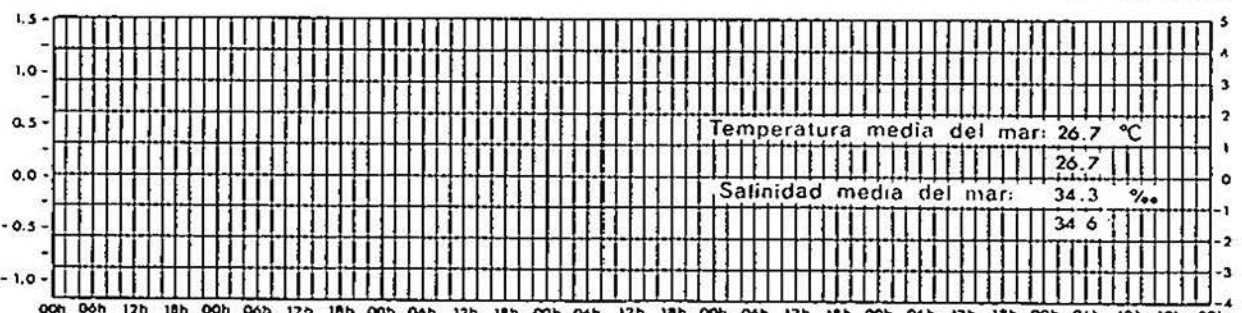
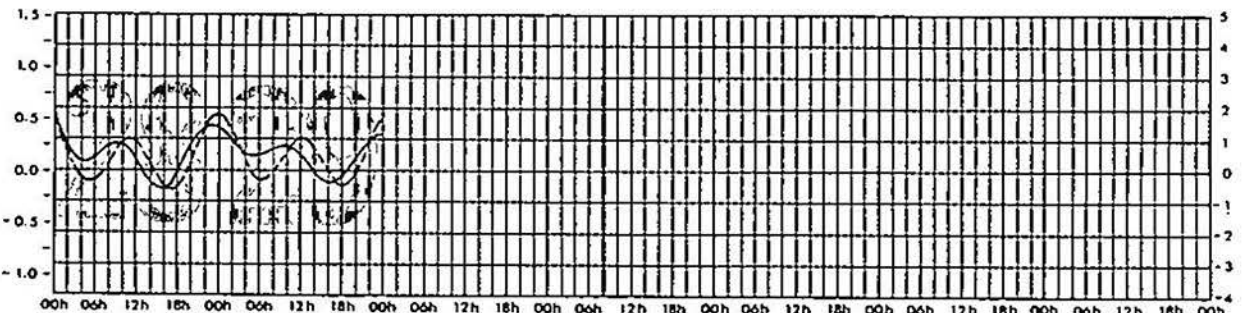
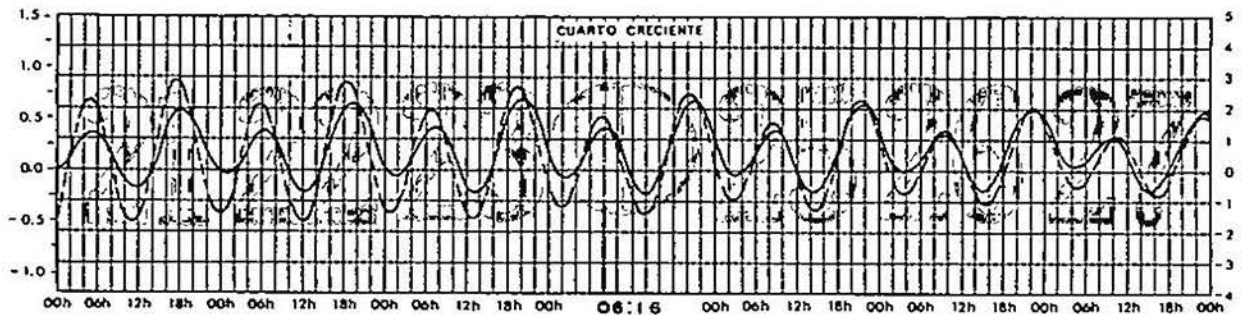
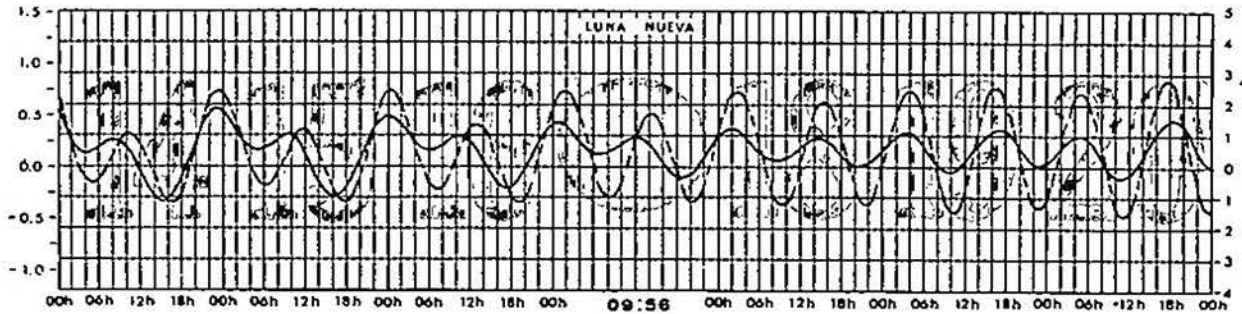
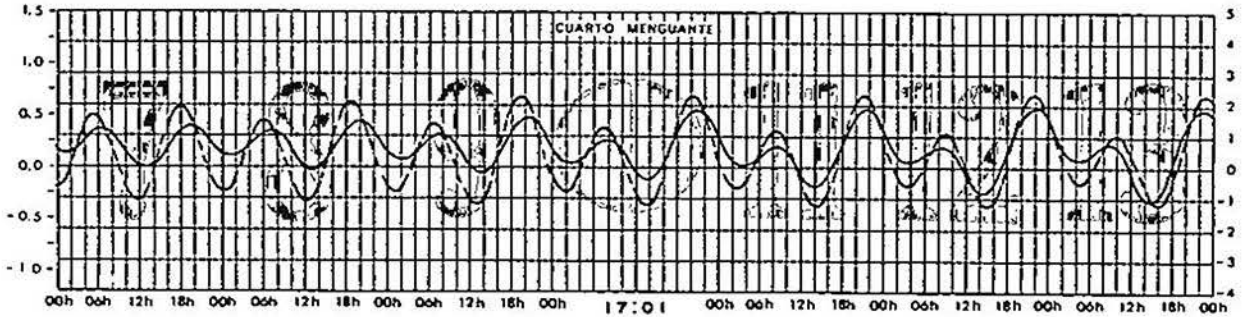
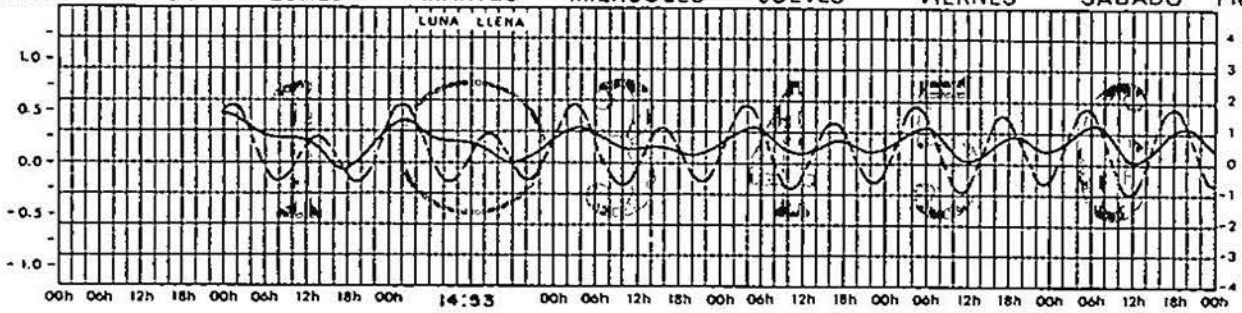
FEBRERO 1988

ACAPULCO, GRO.
PTO. ANGEL, OAX.



INSTITUTO DE GEOFISICA, U. N. A. M.

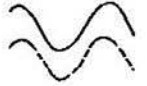
Metros DOMINGO LUNES MARTES MIERCOLES JUEVES VIERNES SABADO Pies





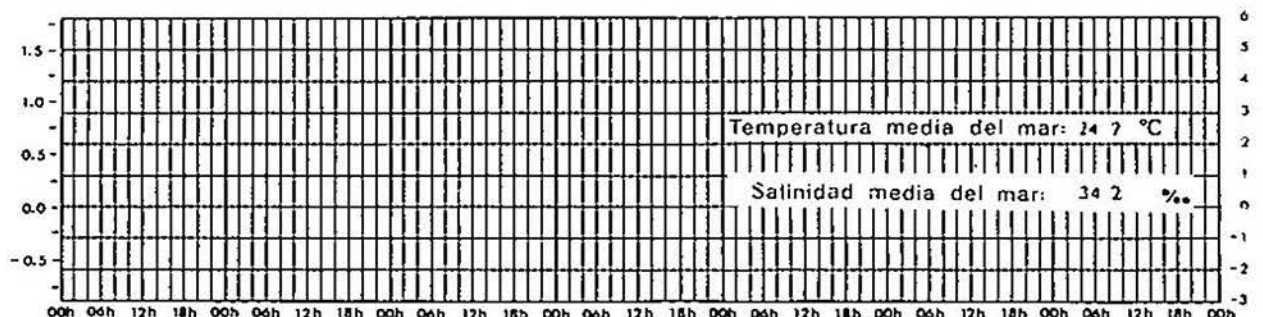
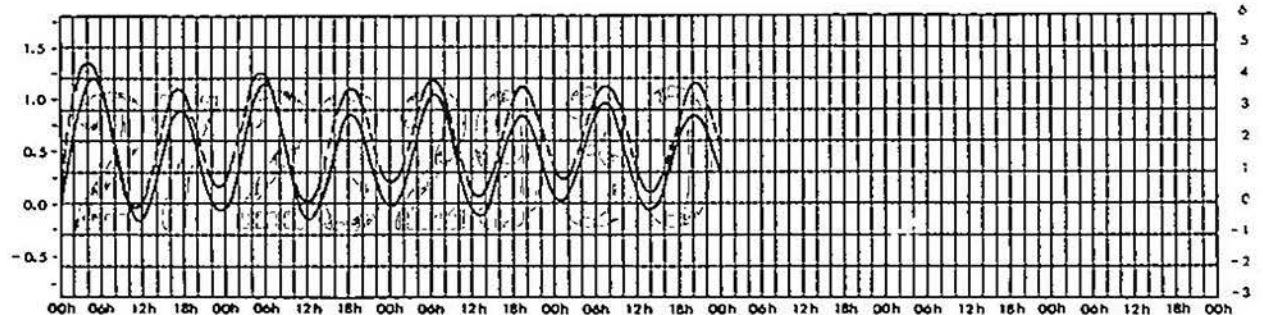
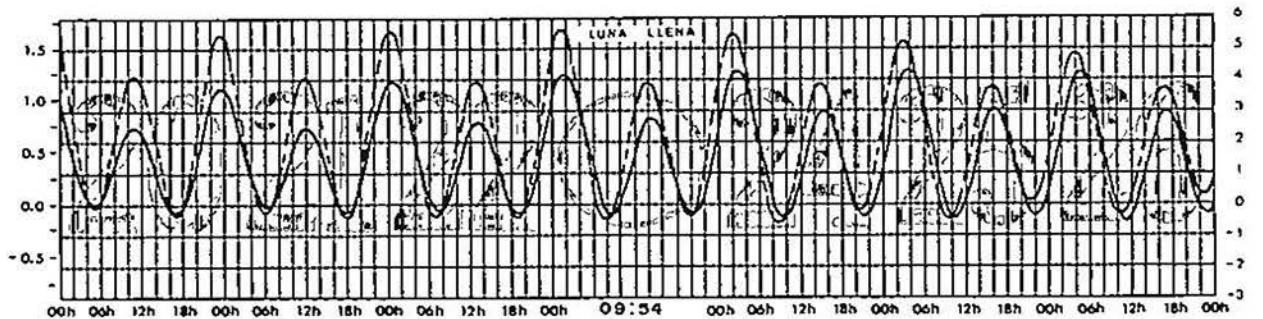
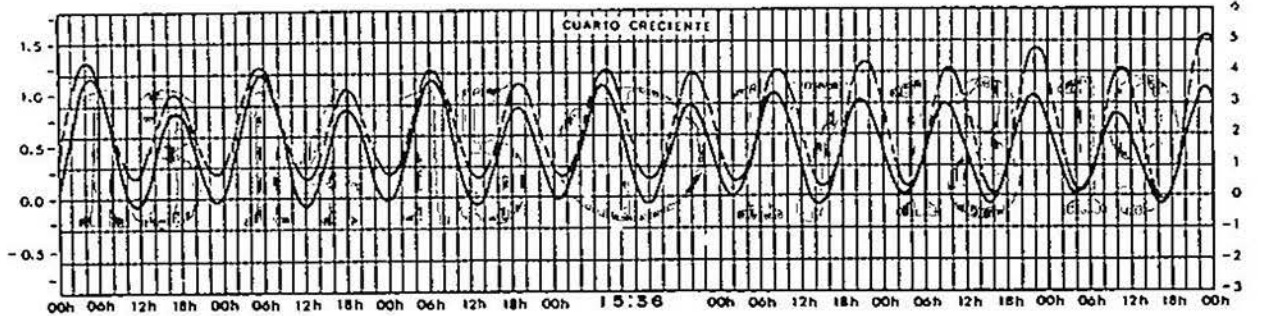
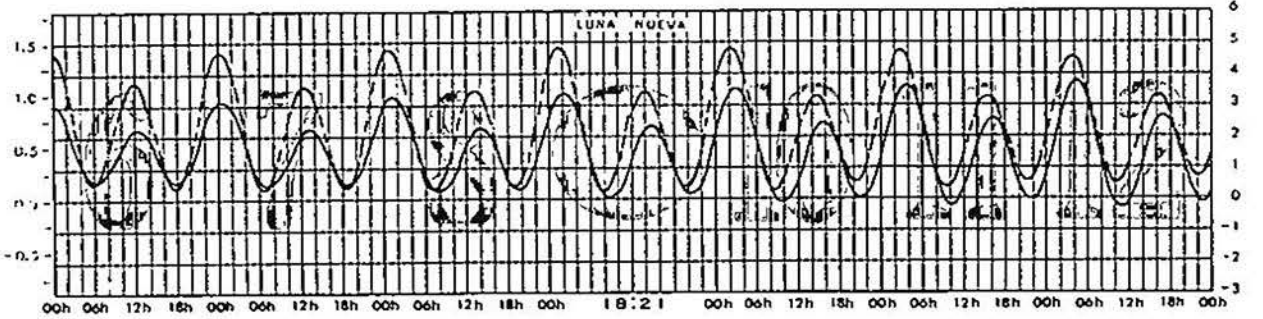
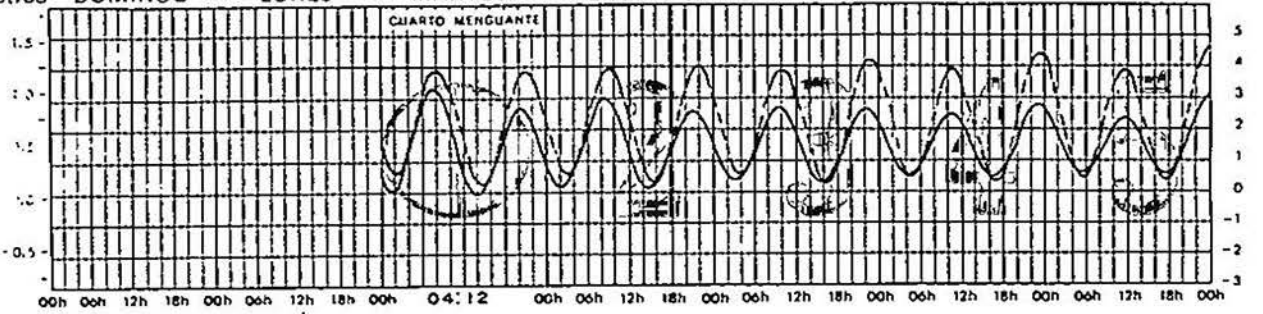
NOVIEMBRE 1988

SALINA CRUZ, OAX.
PUERTO MADERO, CHIS.



INSTITUTO DE GEOFISICA, U. N. A. M.

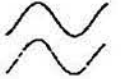
Metros DOMINGO LUNES MARTES MIERCOLES JUEVES VIERNES SABADO Pies





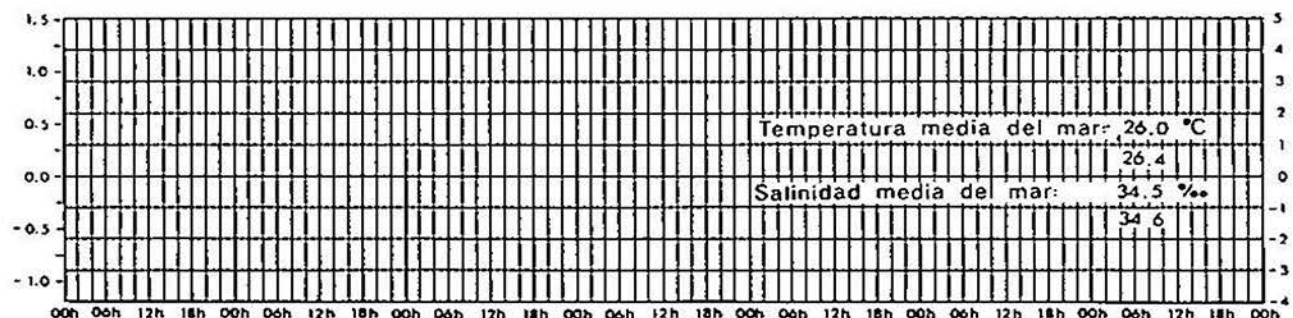
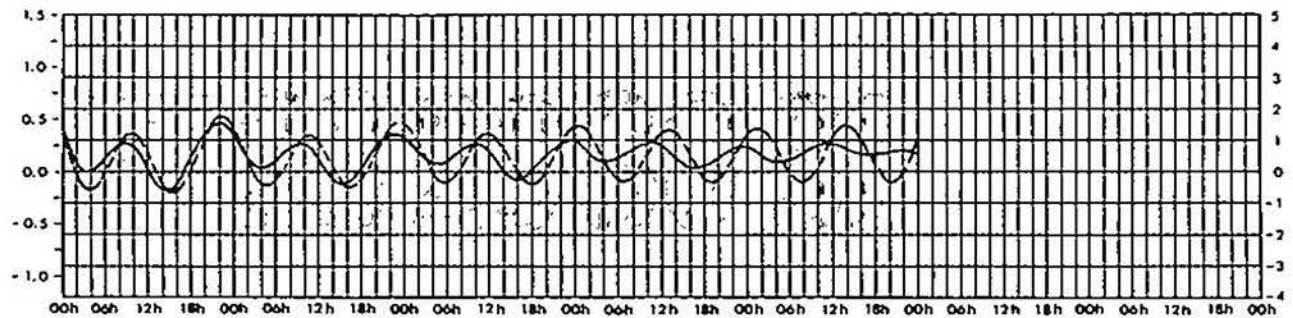
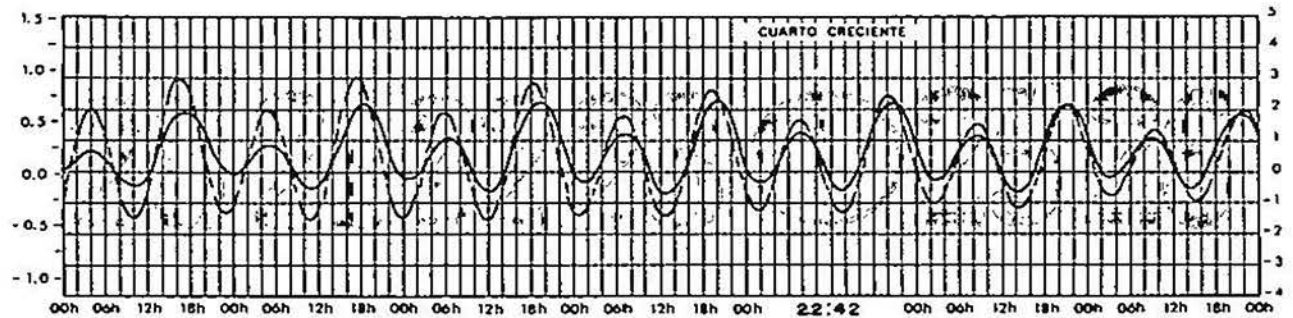
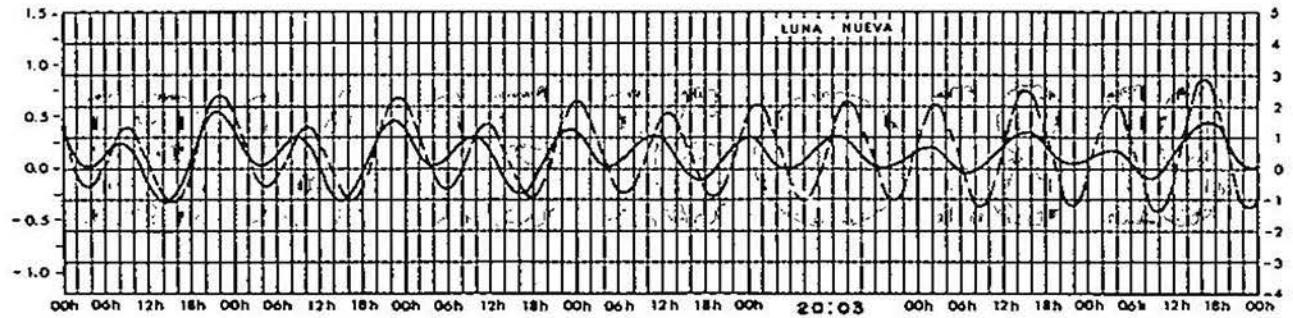
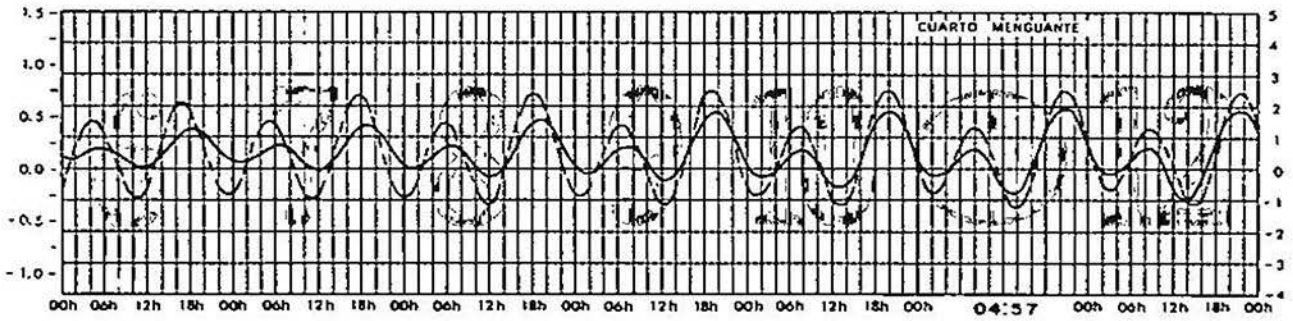
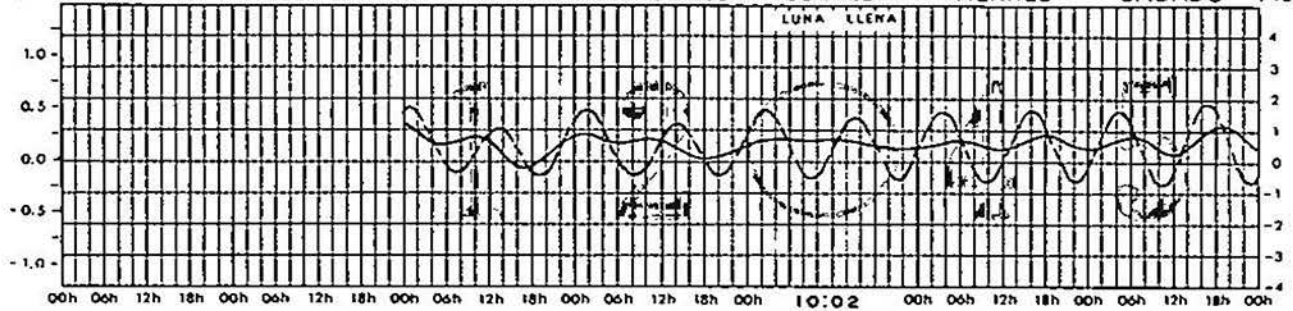
MARZO 1988

ACAPULCO, GRO.
PTO. ANGEL, OAX.



INSTITUTO DE GEOFISICA, U. N. A. M.

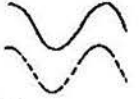
Metros DOMINGO LUNES MARTES MIERCOLES JUEVES VIERNES SABADO Pies





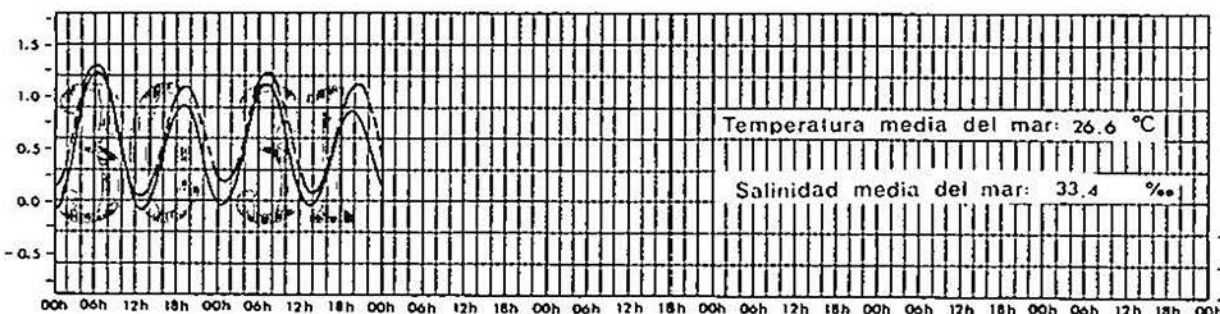
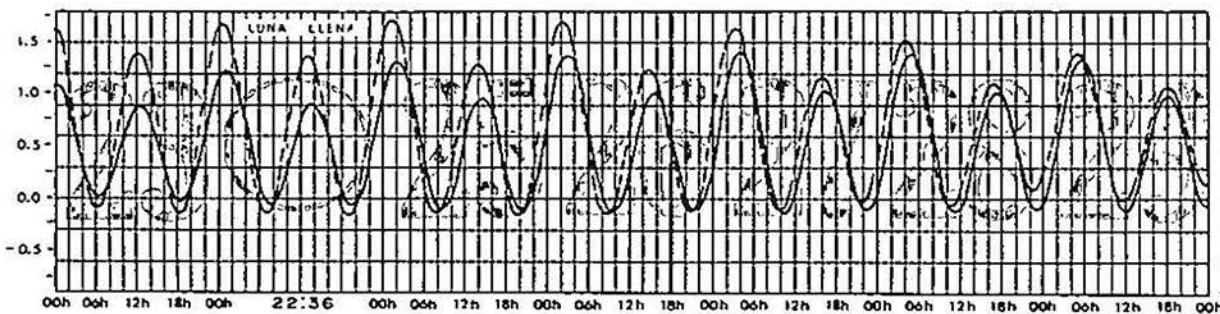
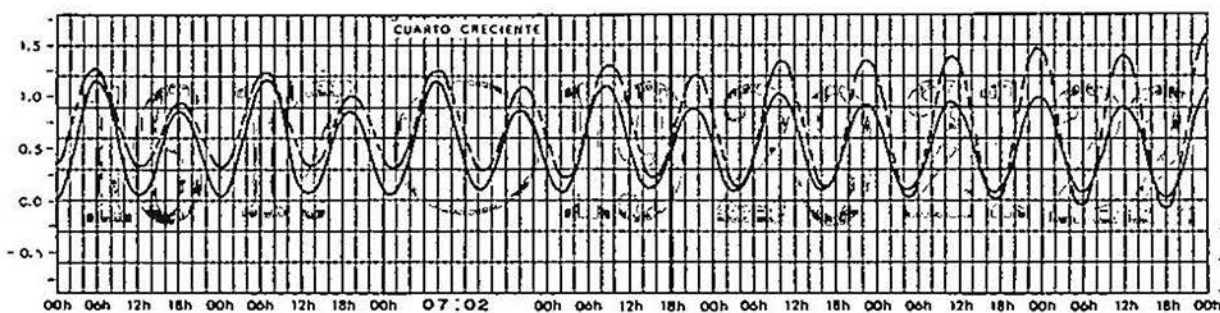
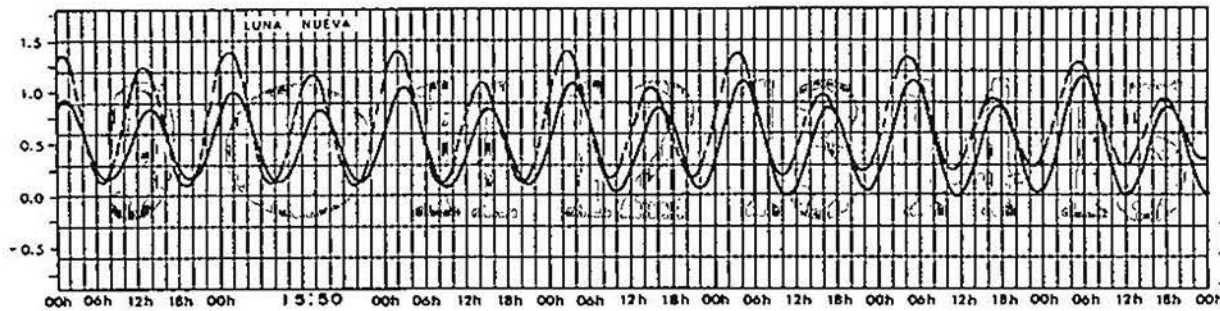
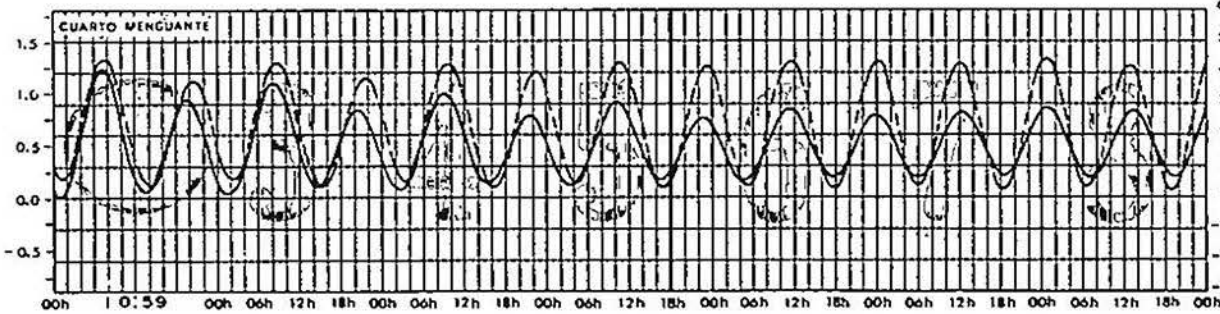
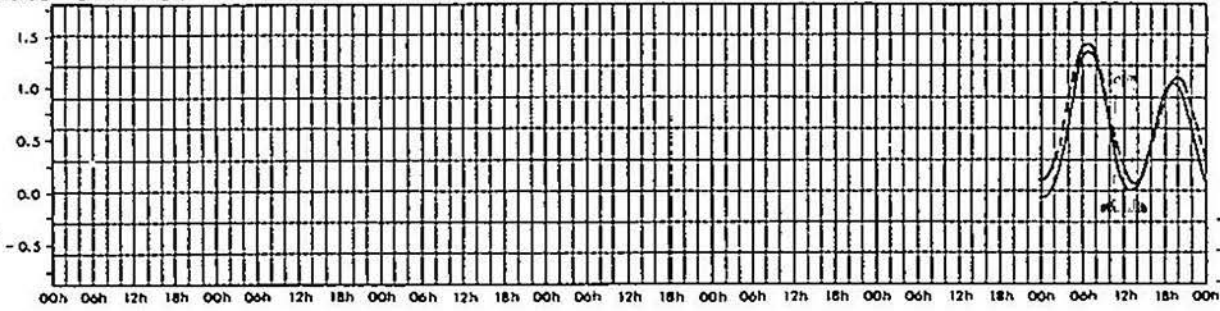
OCTUBRE 1988

SALINA CRUZ, OAX.
PUERTO MADERO, CHIS.



INSTITUTO DE GEOFISICA, U. N. A. M.

Metros DOMINGO LUNES MARTES MIERCOLES JUEVES VIERNES SABADO Pies



Temperatura media del mar: 26.6 °C

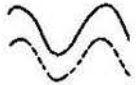
Salinidad media del mar: 33.4 ‰



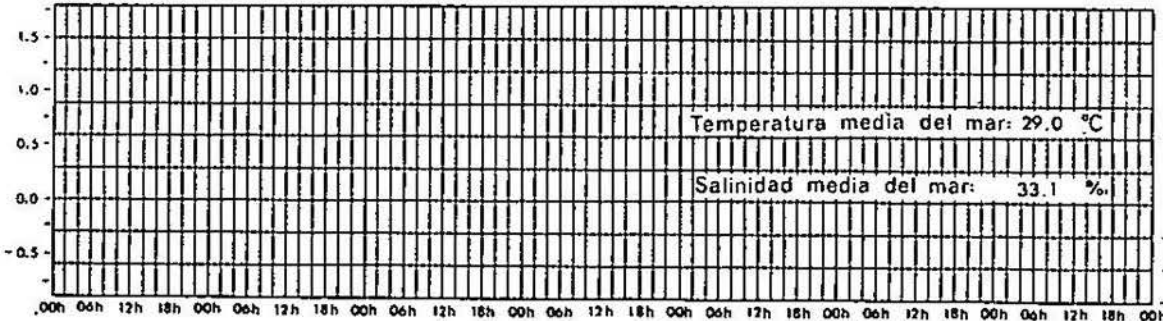
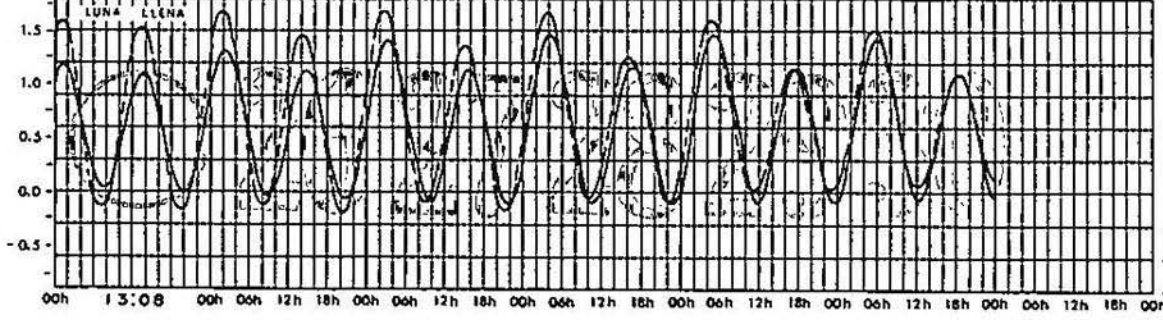
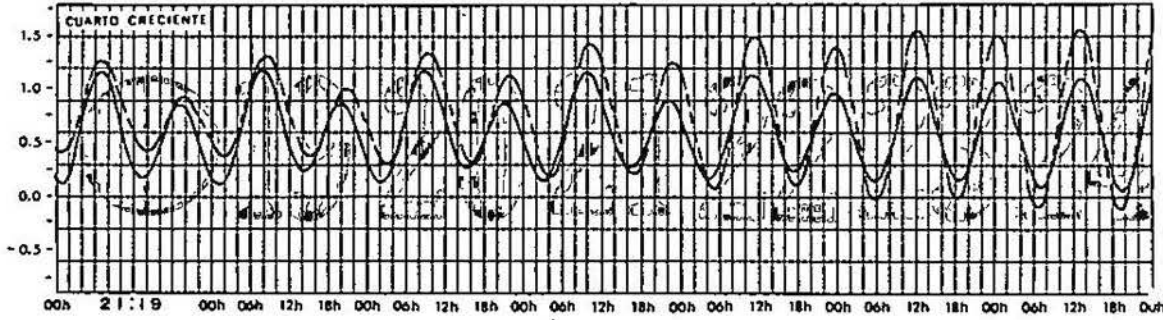
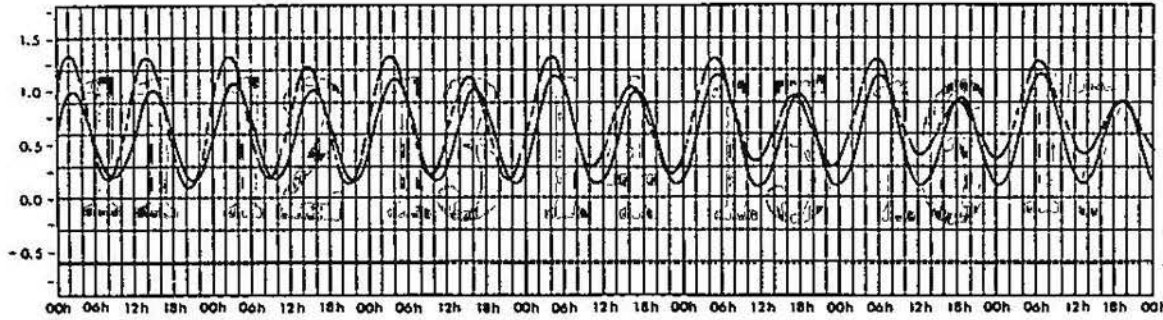
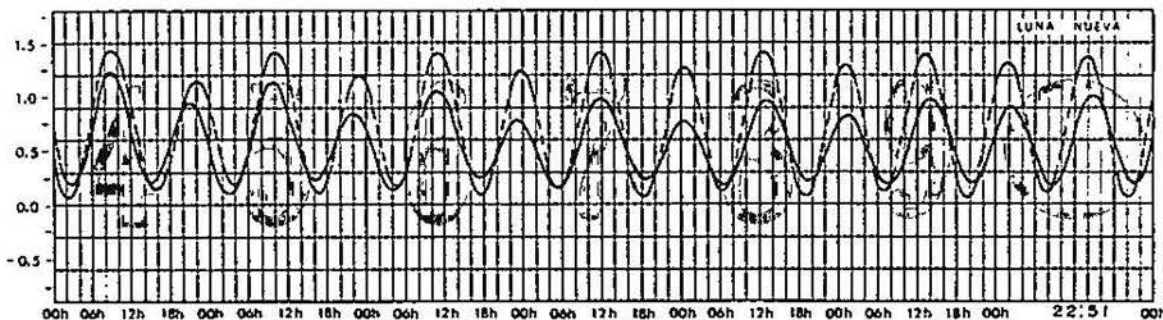
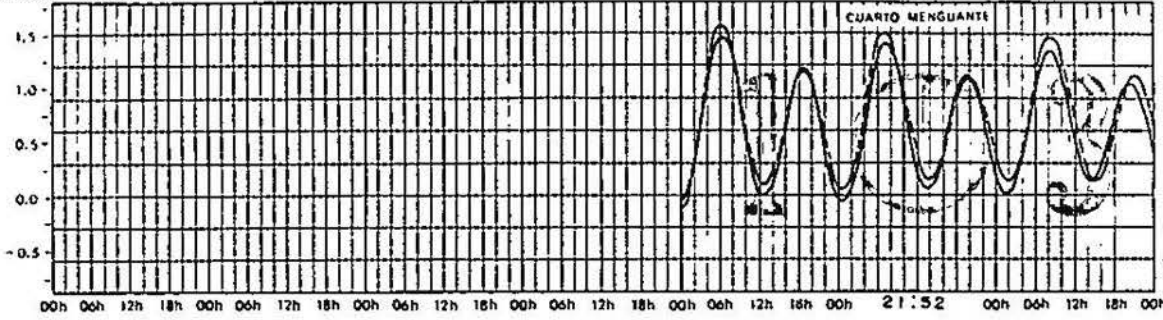
SEPTIEMBRE 1988

SALINA CRUZ, OAX.
PUERTO MADERO, CHIS.

INSTITUTO DE GEOFISICA, U. N. A. M.



Metros DOMINGO LUNES MARTES MIERCOLES JUEVES VIERNES SABADO Pies



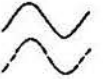
HORA DEL MERIDIANO 99°W

PLANO DE REFERENCIA: N. S. M. L.



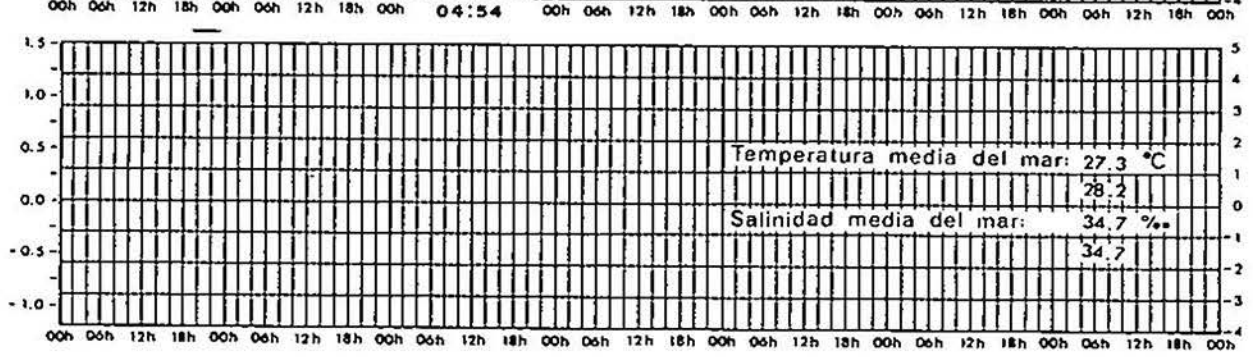
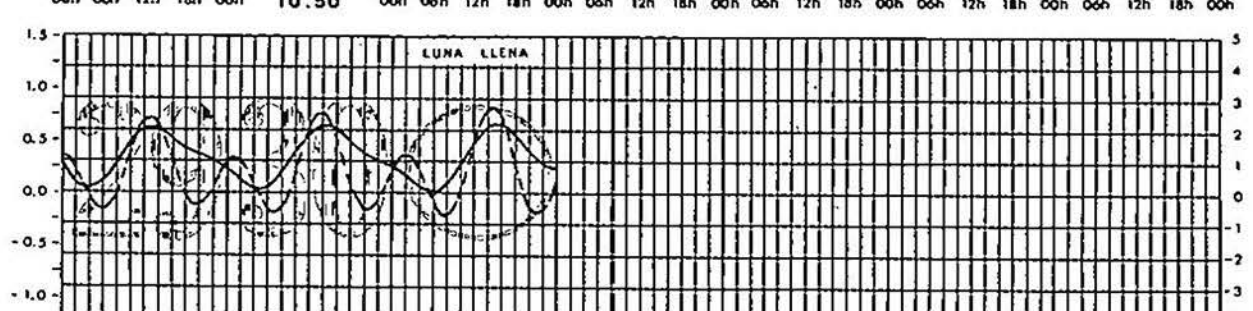
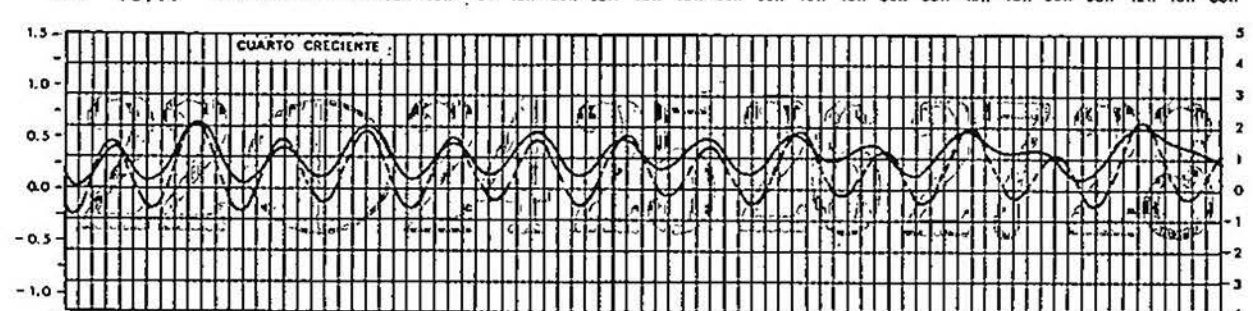
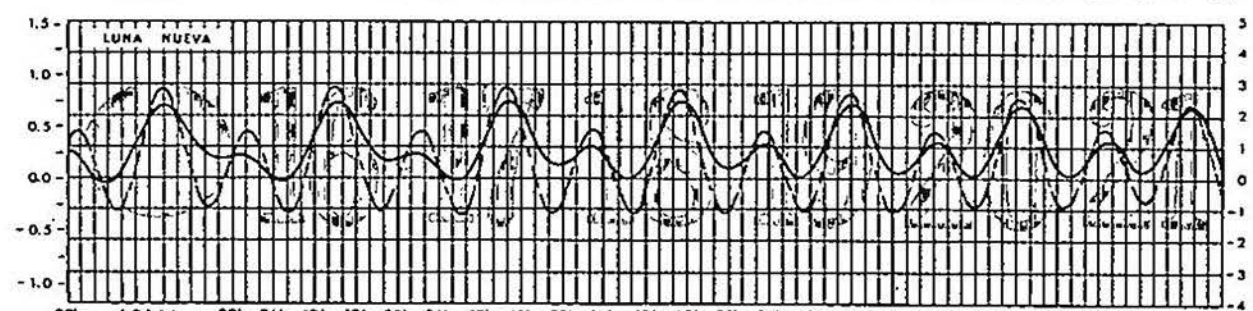
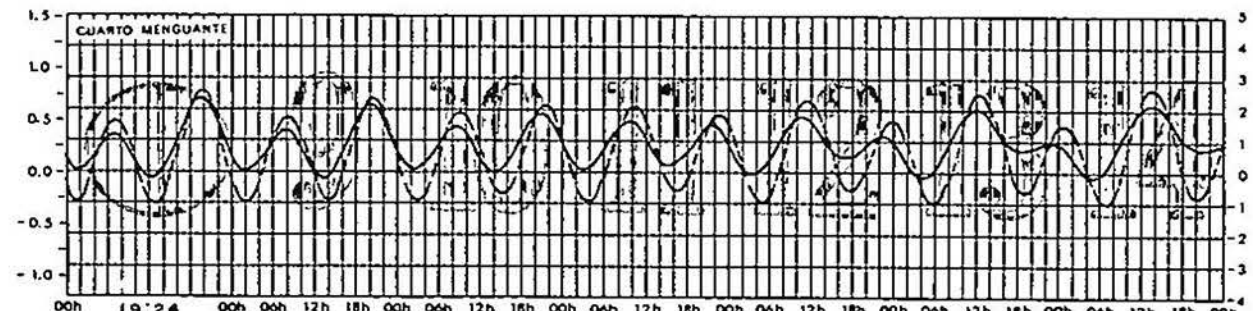
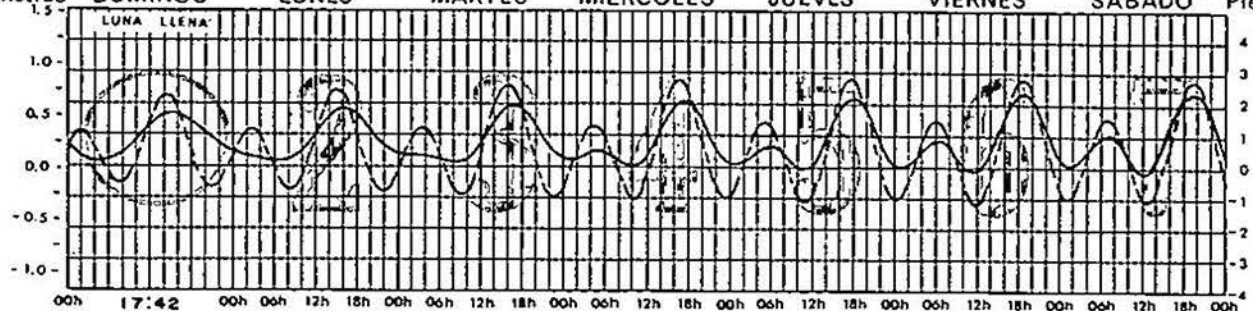
MAYO 1988

ACAPULCO, GRO.
PTO. ANGEL, OAX.



INSTITUTO DE GEOFISICA, U. N. A. M.

Metros DOMINGO LUNES MARTES MIERCOLES JUEVES VIERNES SABADO Pies





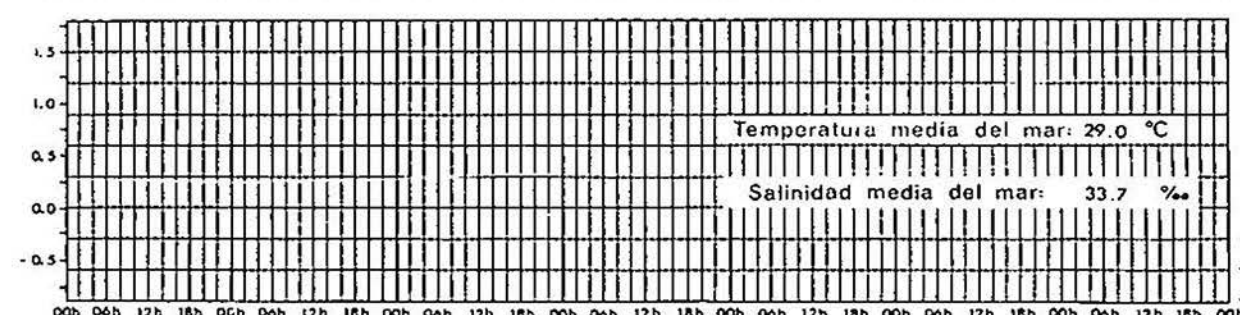
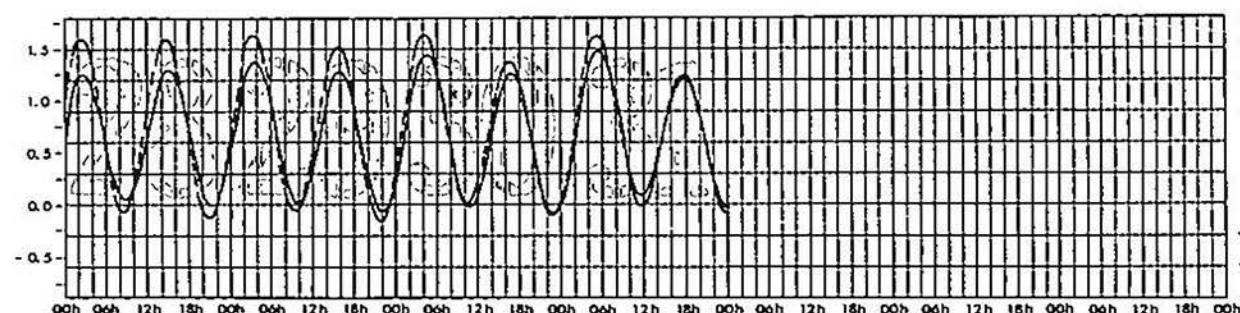
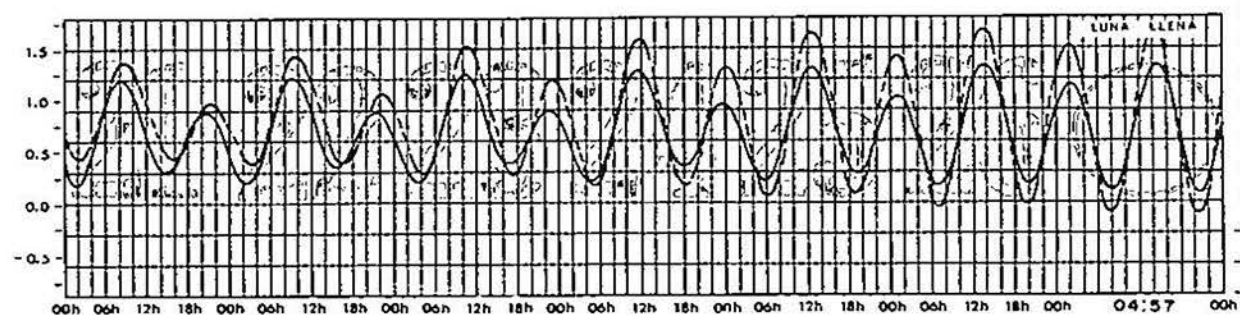
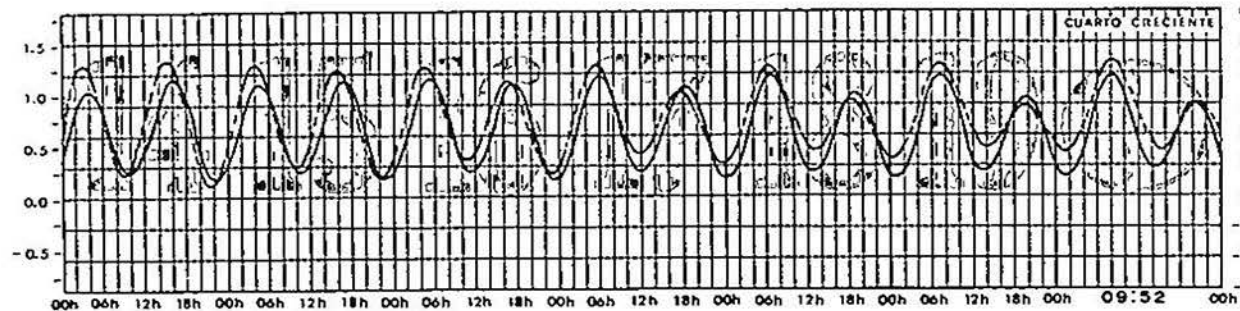
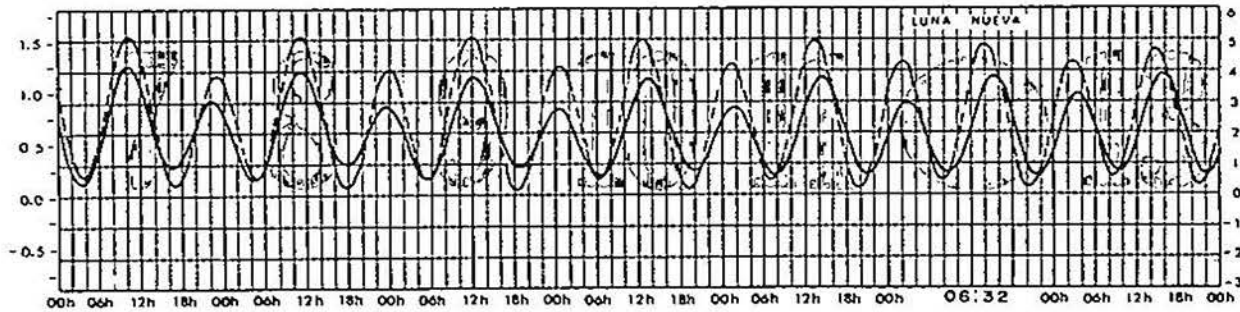
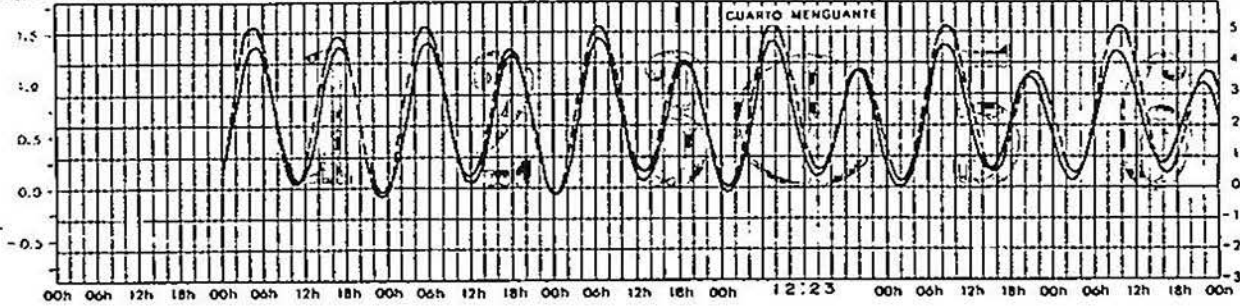
AGOSTO 1988

SALINA CRUZ, OAX.
PUERTO MADERO, CHIS.



INSTITUTO DE GEOFISICA, U. N. A. M.

Metros DOMINGO LUNES MARTES MIERCOLES JUEVES VIERNES SABADO Pies



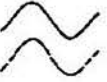
Temperatura media del mar: 29.0 °C

Salinidad media del mar: 33.7 ‰

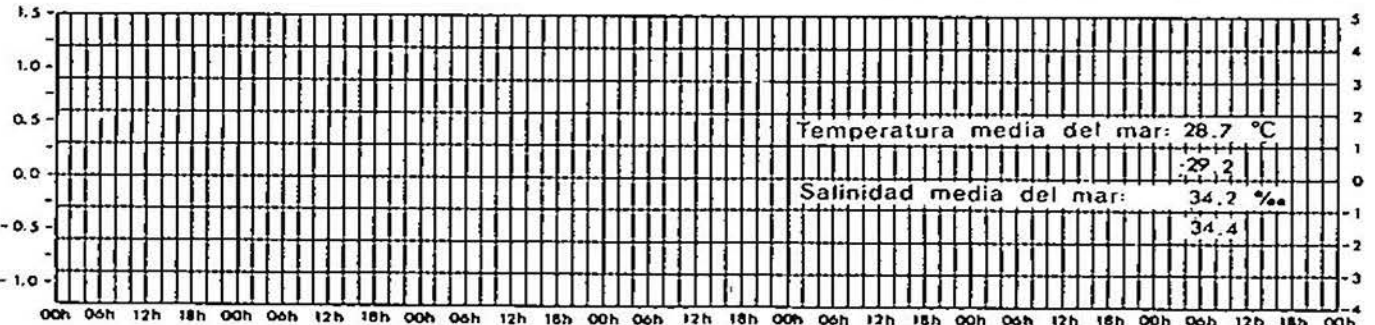
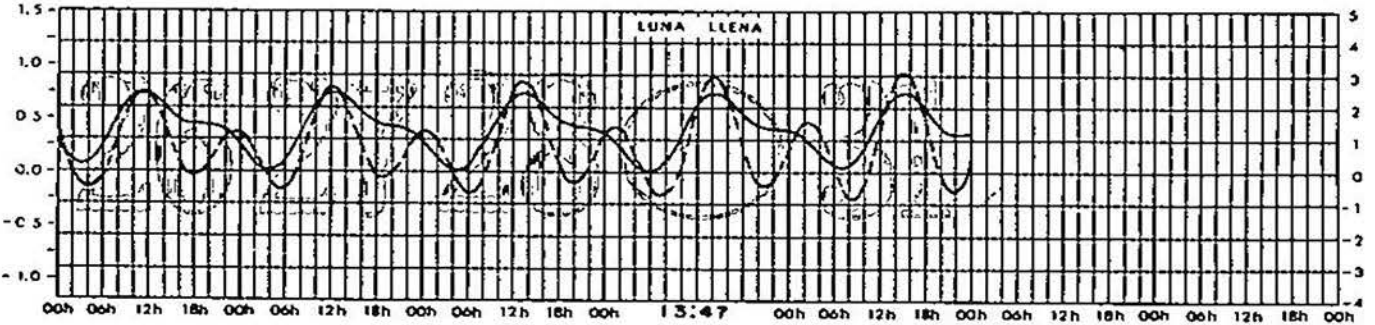
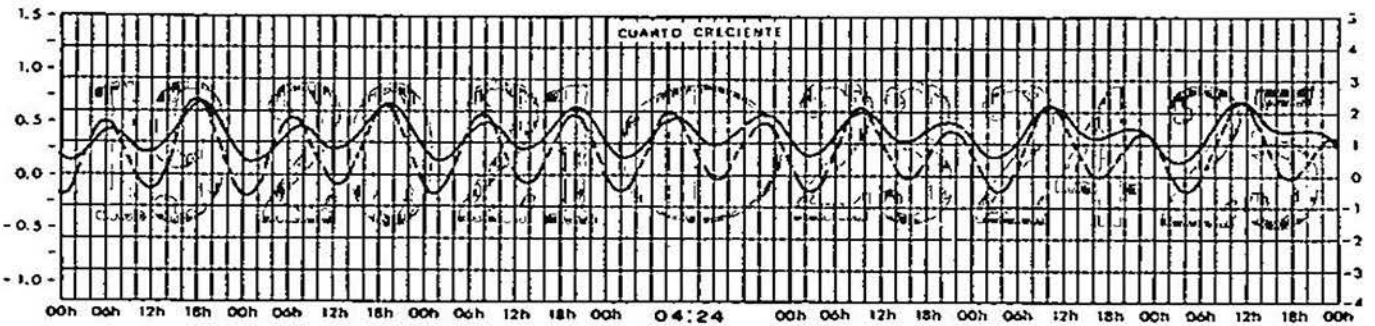
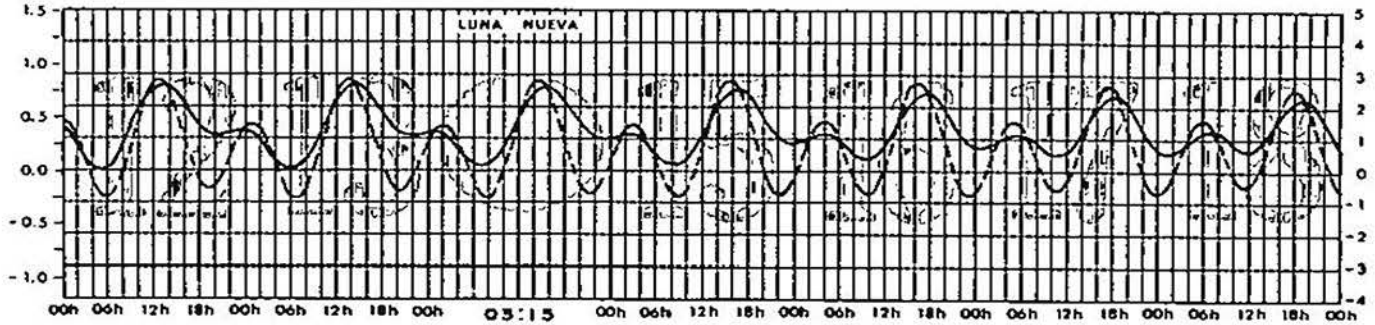
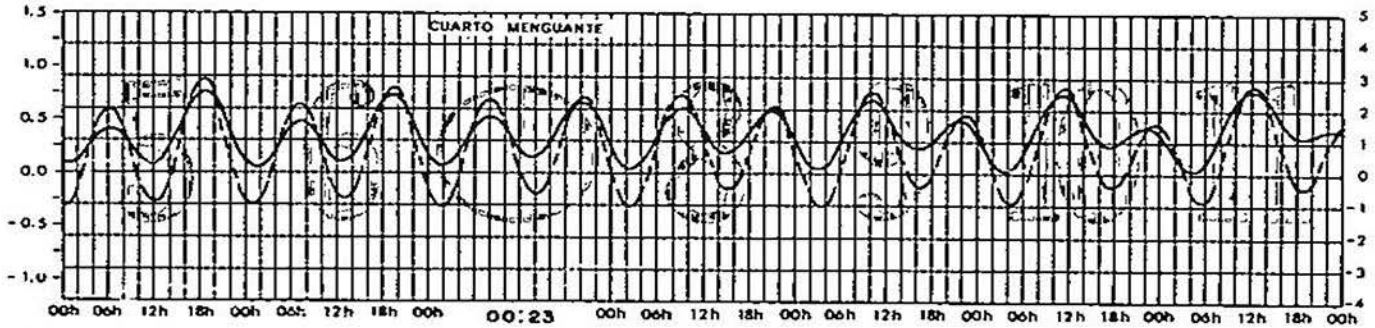
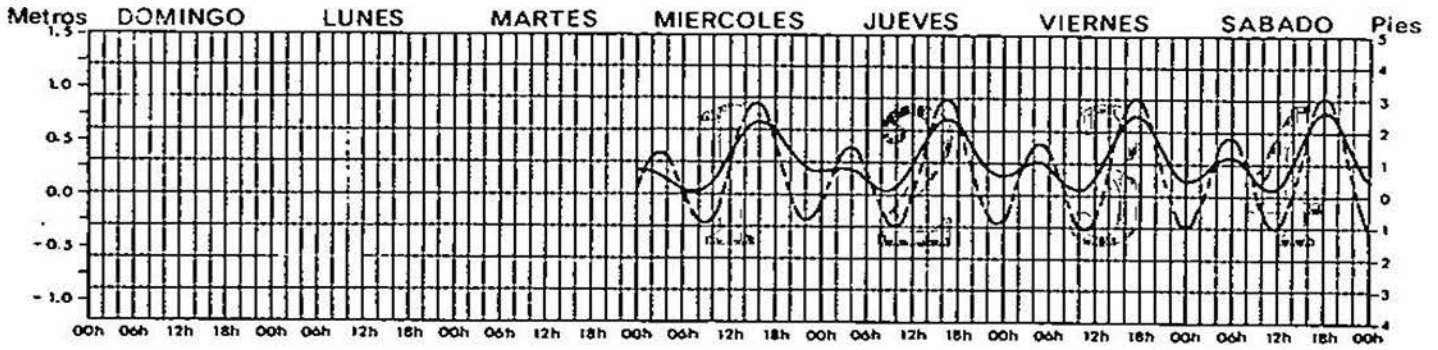


JUNIO 1988

ACAPULCO, GRO.
PTO. ANGEL, OAX.



INSTITUTO DE GEOFISICA, U. N. A. M.

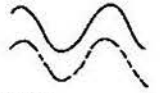


Temperatura media del mar: 28.7 °C
 Salinidad media del mar: 34.2 ‰

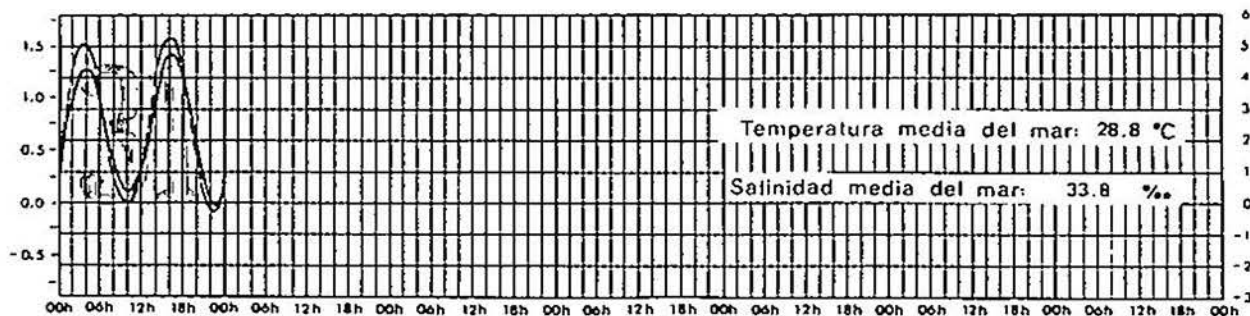
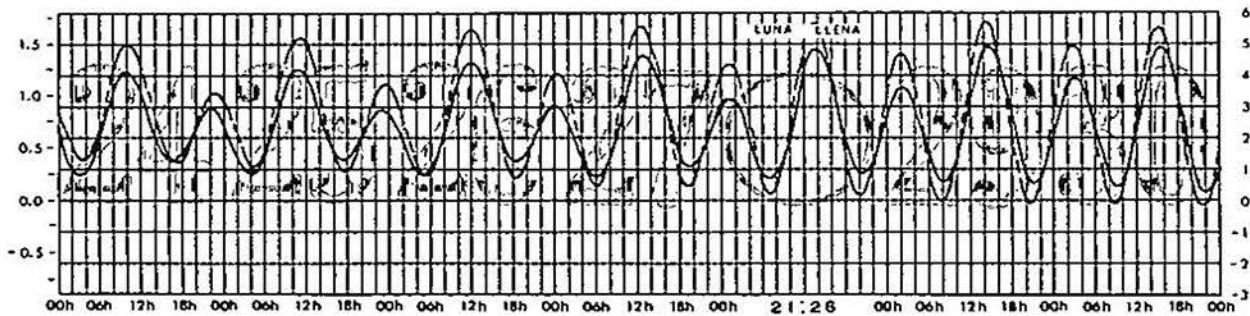
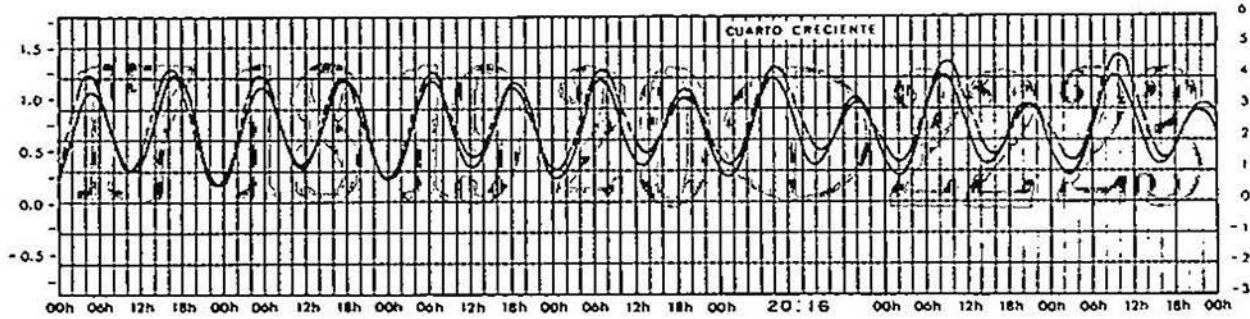
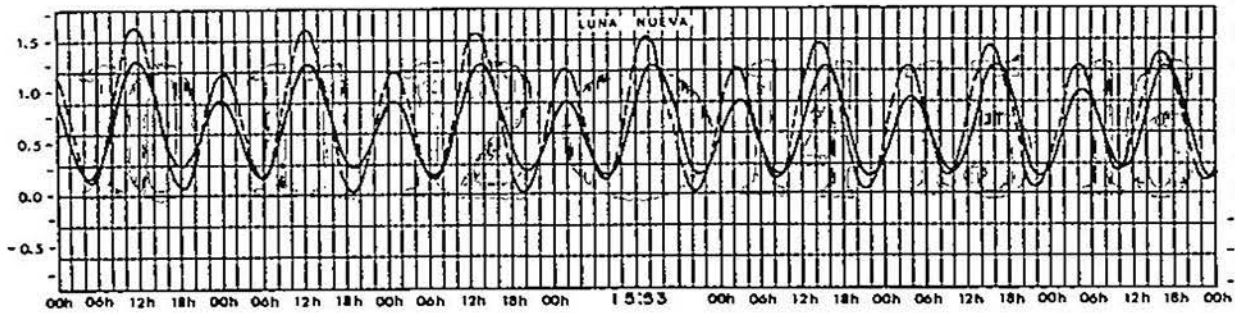
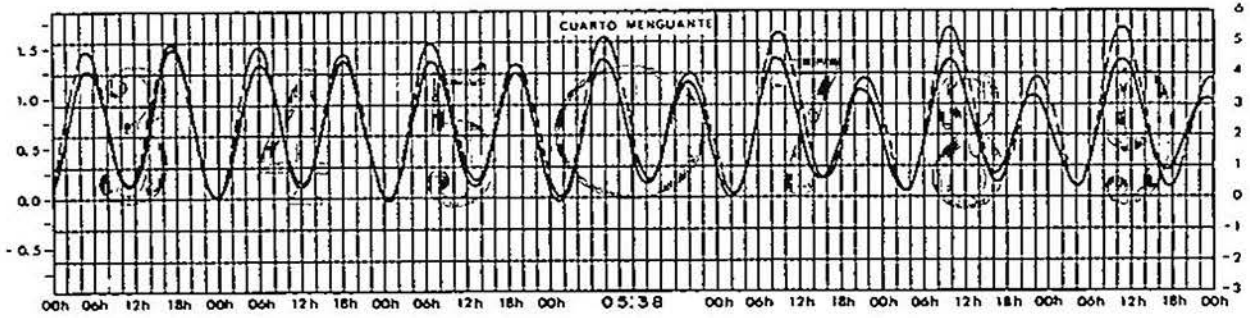
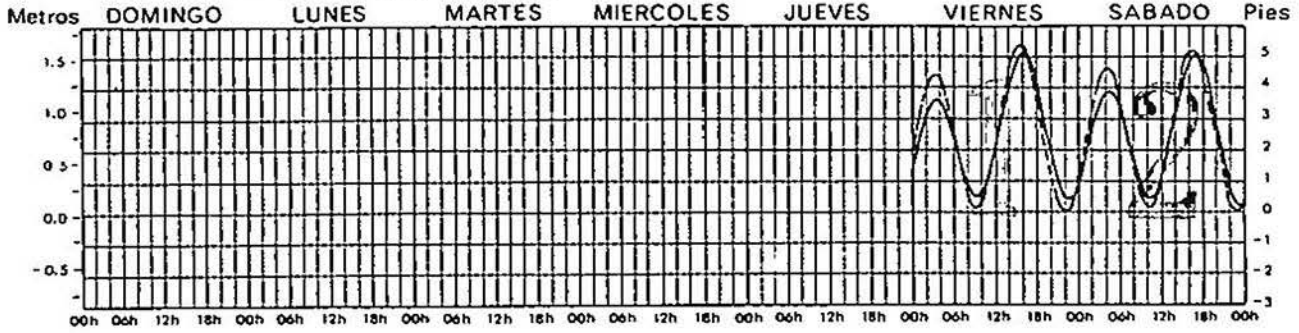


JULIO 1988

SALINA CRUZ, OAX.
PUERTO MADERO, CHIS.



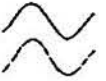
INSTITUTO DE GEOFISICA, U. N. A. M.



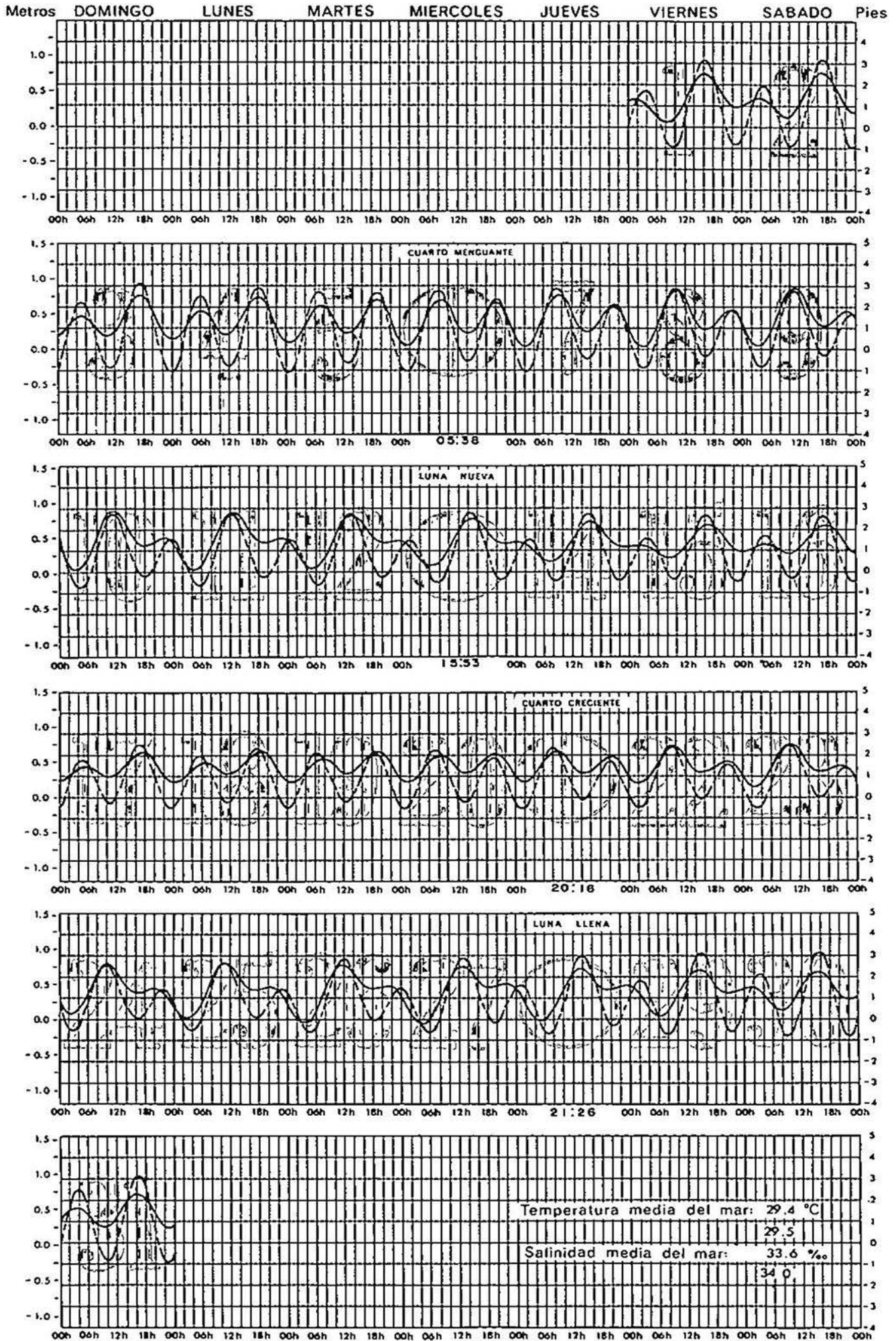


JULIO 1988

ACAPULCO, GRO.
PTO. ANGEL, OAX.



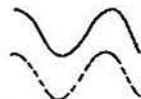
INSTITUTO DE GEOFISICA, U. N. A. M.



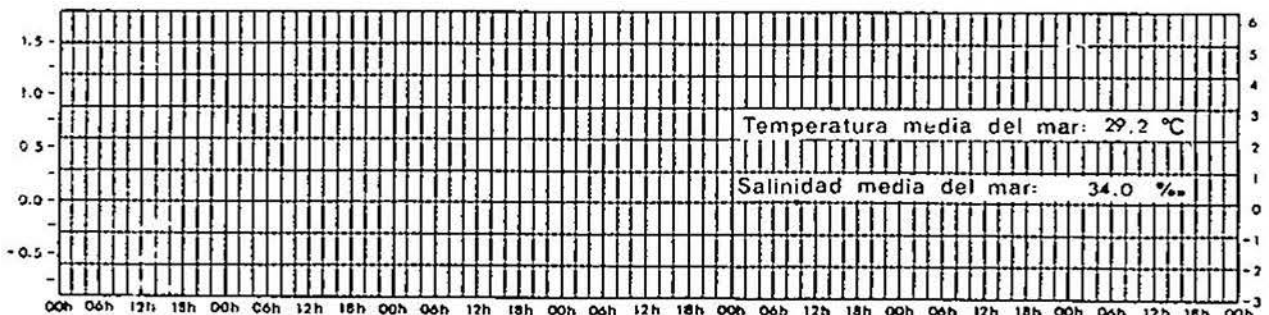
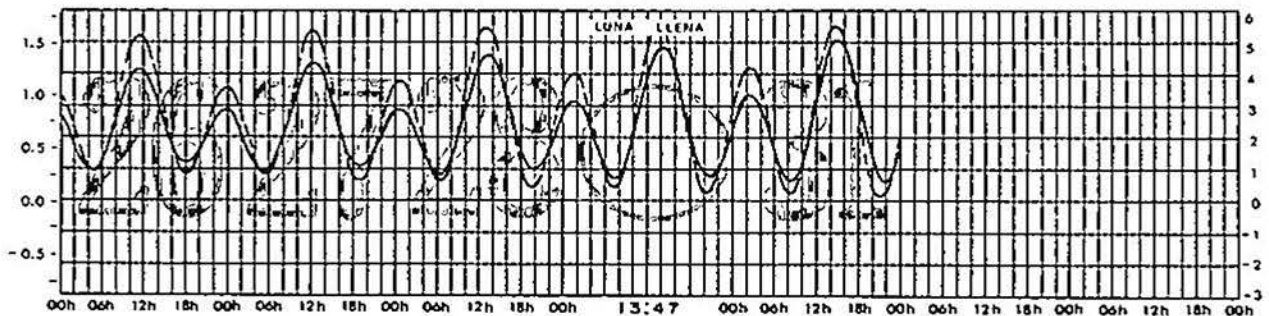
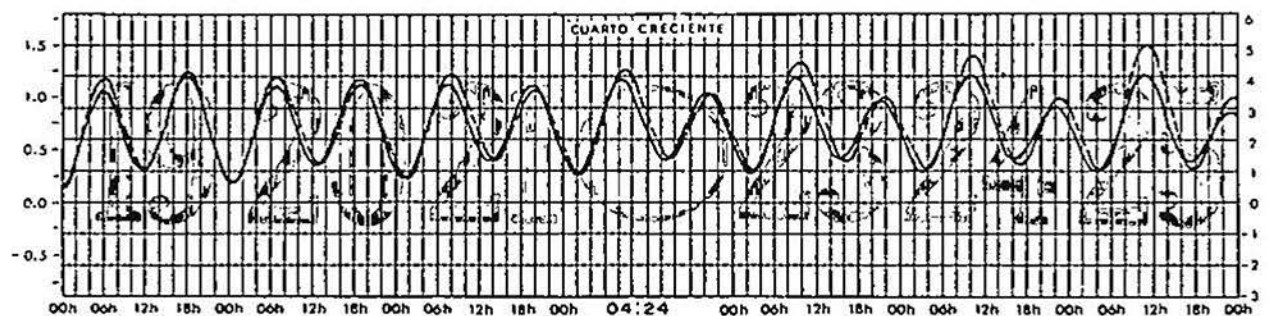
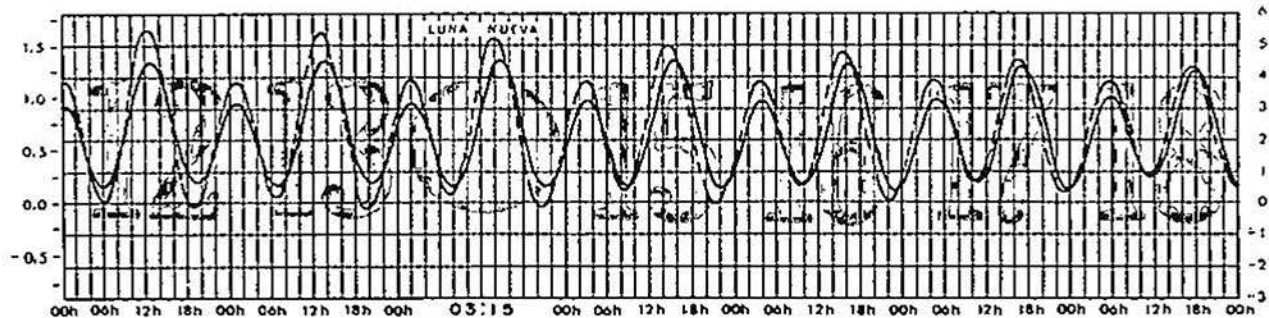
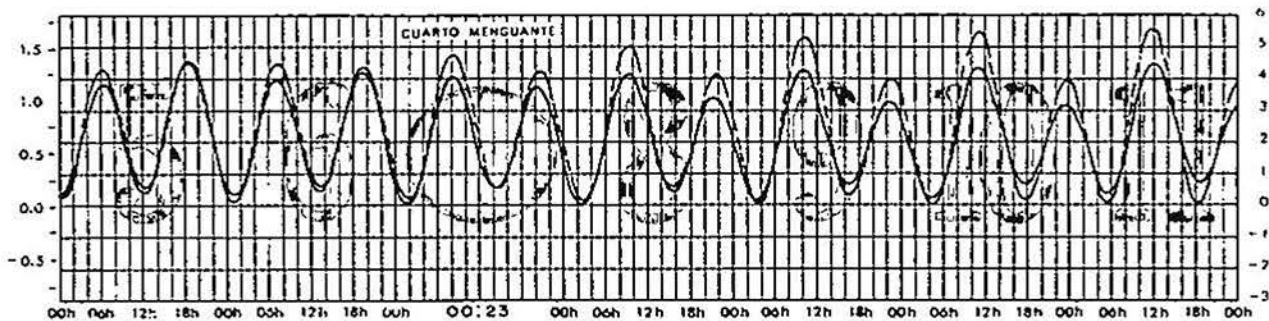
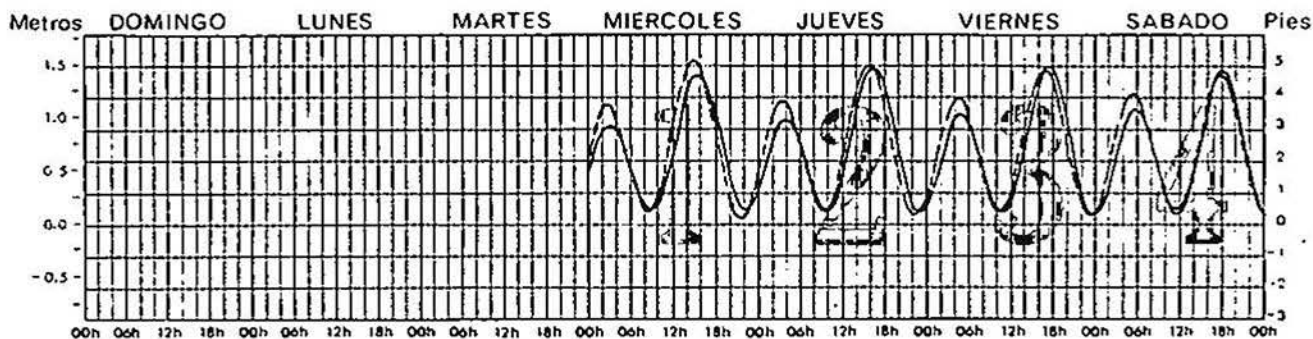


JUNIO 1988

SALINA CRUZ, OAX.
PUERTO MADERO, CHIS.



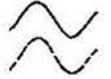
INSTITUTO DE GEOFISICA, U. N. A. M.





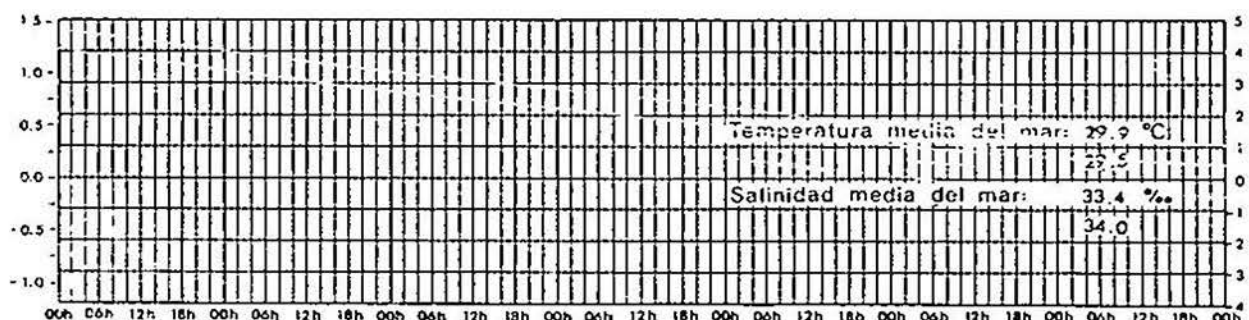
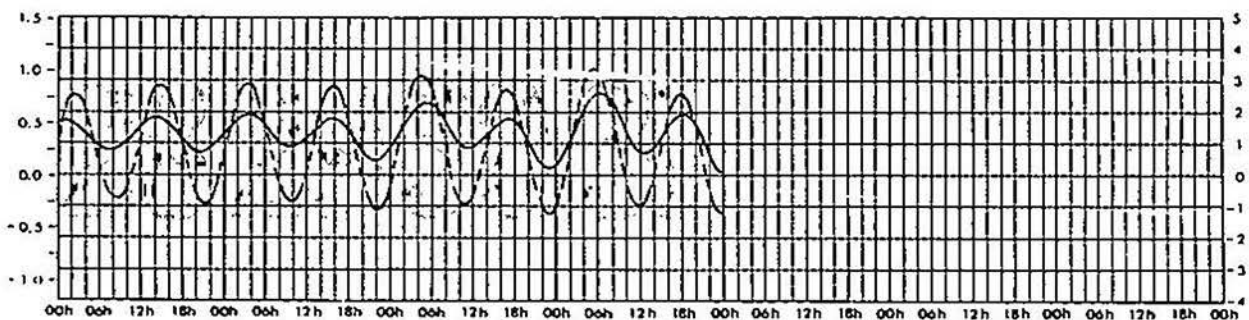
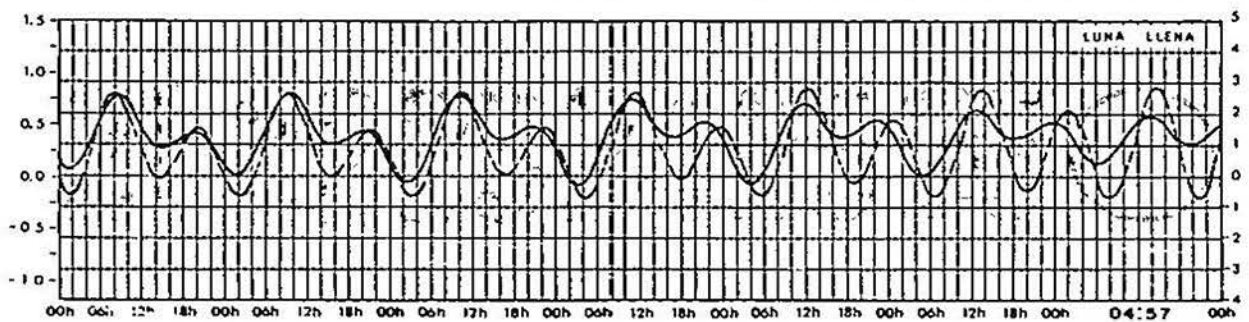
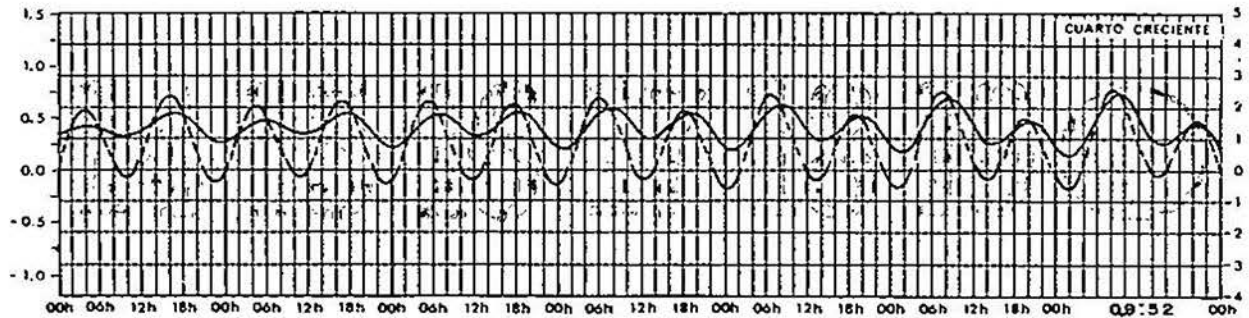
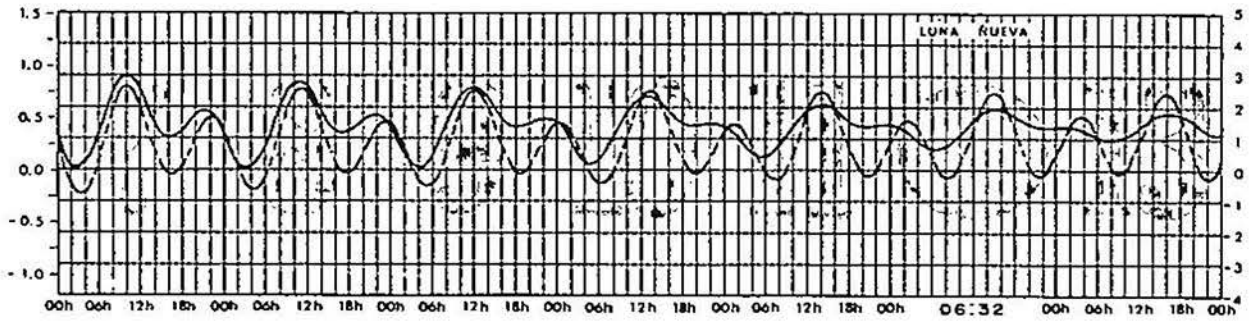
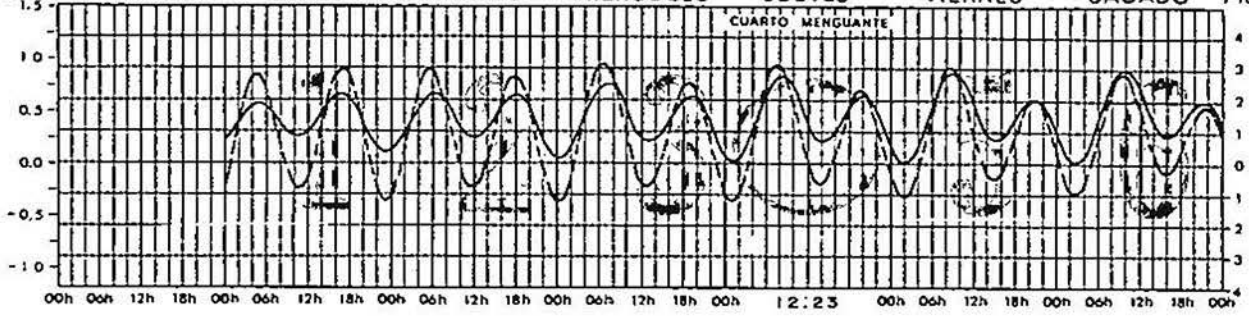
AGOSTO 1988

ACAPULCO, GRO.
PTO. ANGEL, OAX.



INSTITUTO DE GEOFISICA, U. N. A. M.

Metros DOMINGO LUNES MARTES MIERCOLES JUEVES VIERNES SABADO Pies

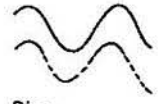


Temperatura media del mar: 29.9 °C
 27.5
 Salinidad media del mar: 33.4 ‰
 34.0



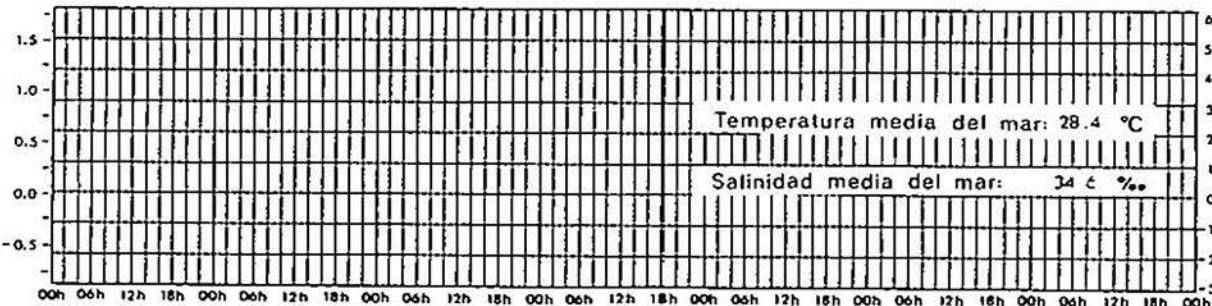
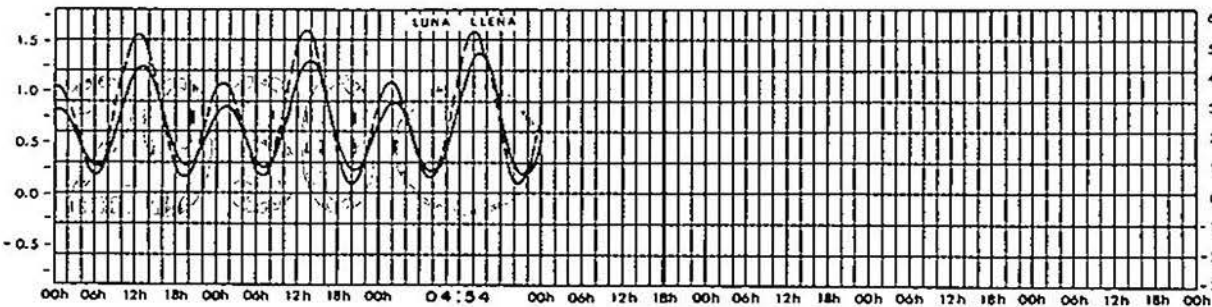
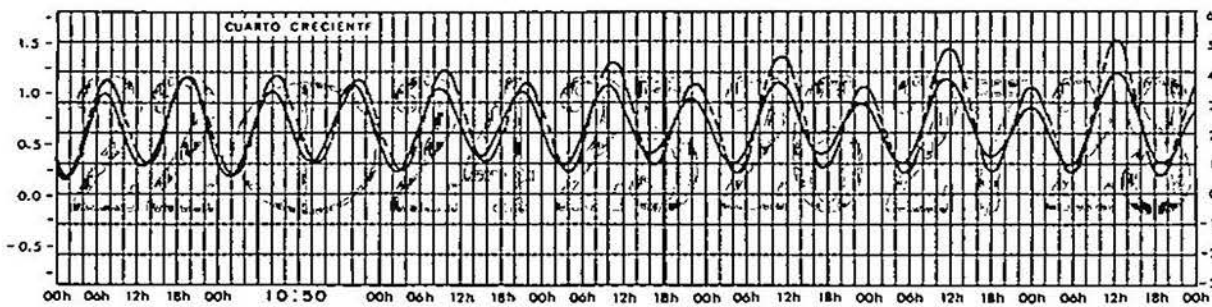
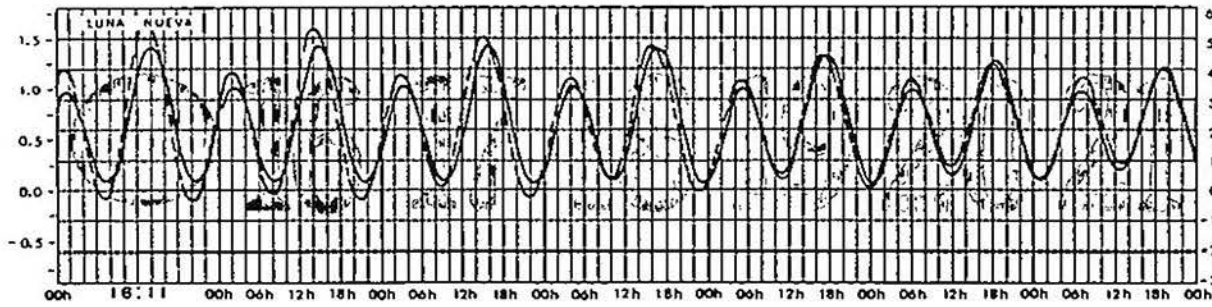
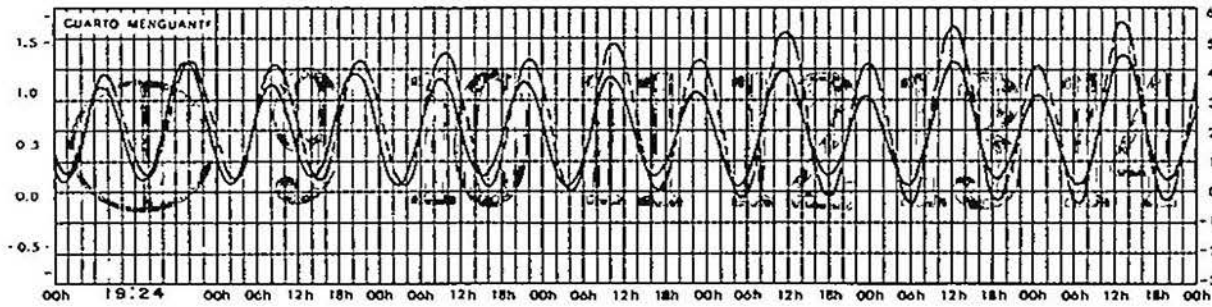
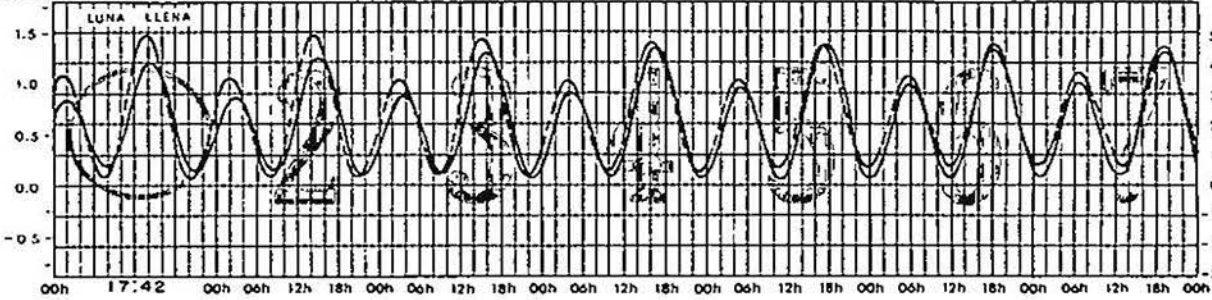
MAYO 1988

SALINA CRUZ, OAX.
PUERTO MADERO, CHIS.



INSTITUTO DE GEOFISICA, U. N. A. M.

Metros DOMINGO LUNES MARTES MIERCOLES JUEVES VIERNES SABADO Pies



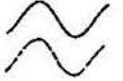
Temperatura media del mar: 28.4 °C

Salinidad media del mar: 34 ‰



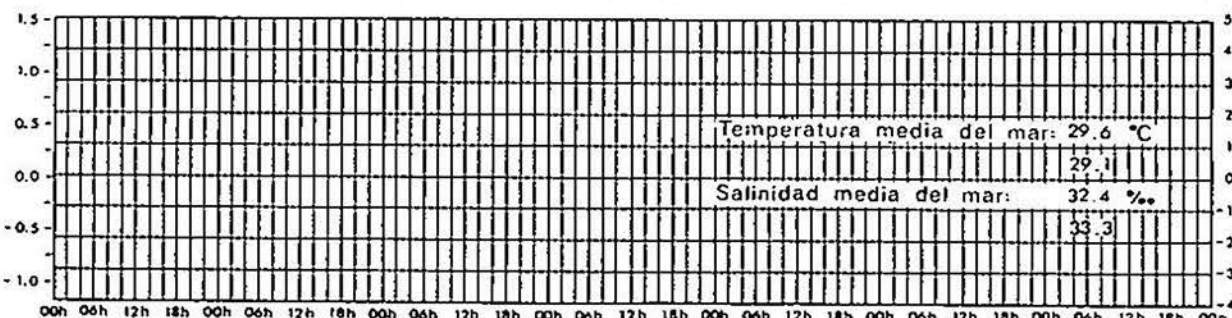
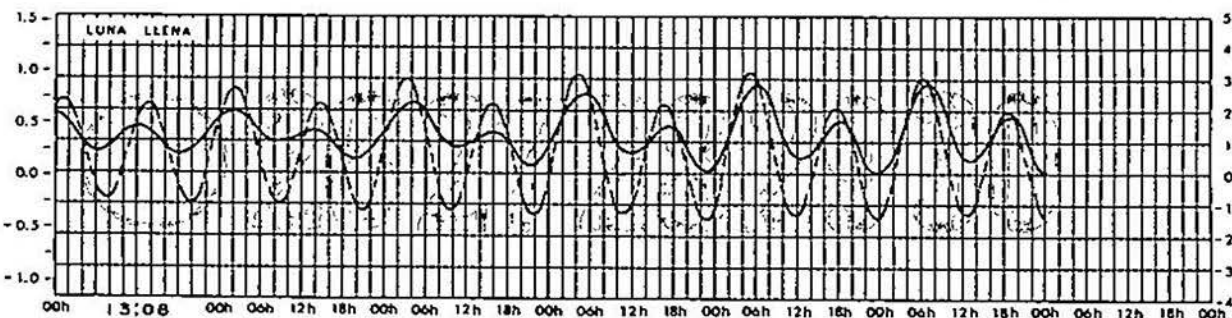
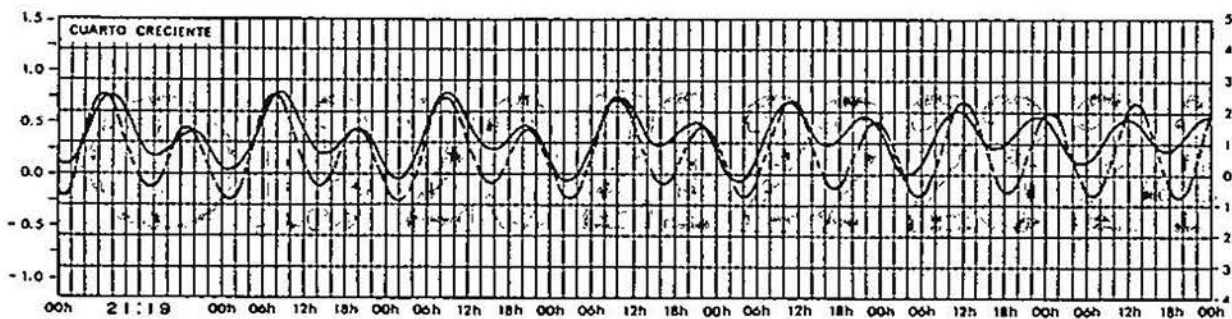
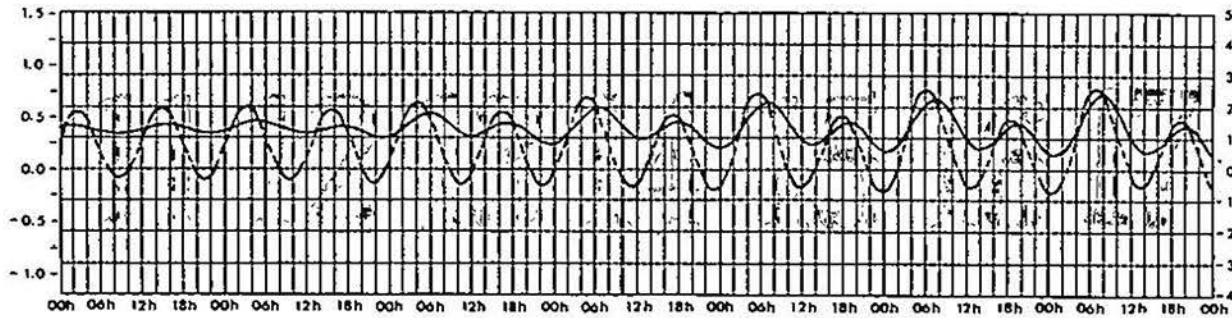
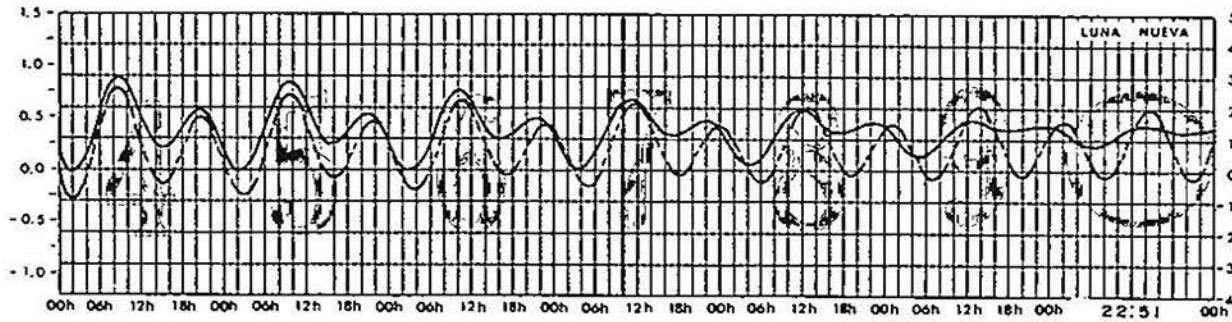
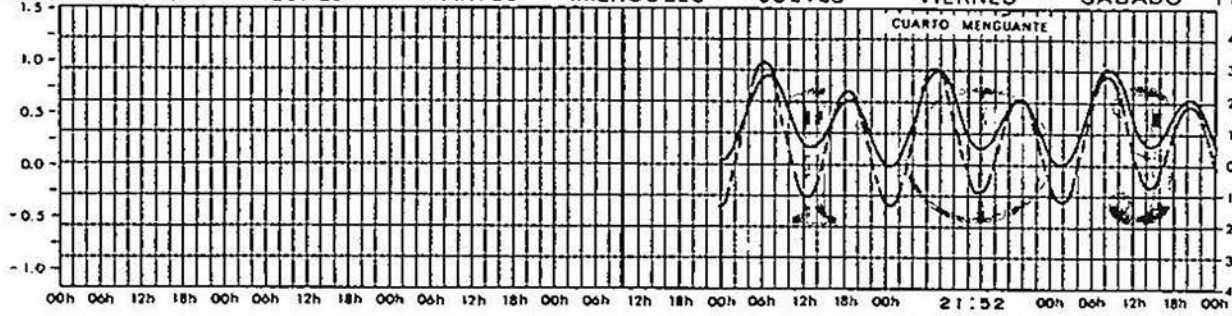
SEPTIEMBRE 1988

ACAPULCO, GRO.
PTO. ANGEL, OAX.



INSTITUTO DE GEOFISICA, U. N. A. M.

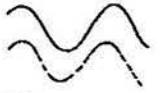
Metros DOMINGO LUNES MARTES MIERCOLES JUEVES VIERNES SABADO Pies





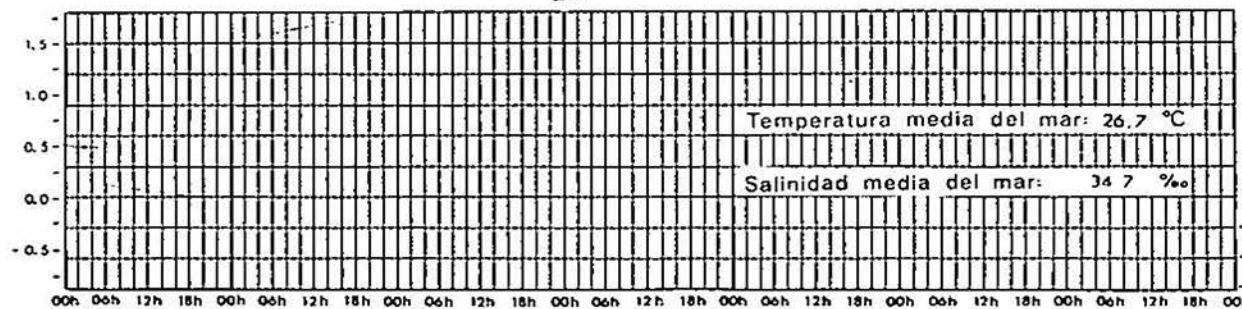
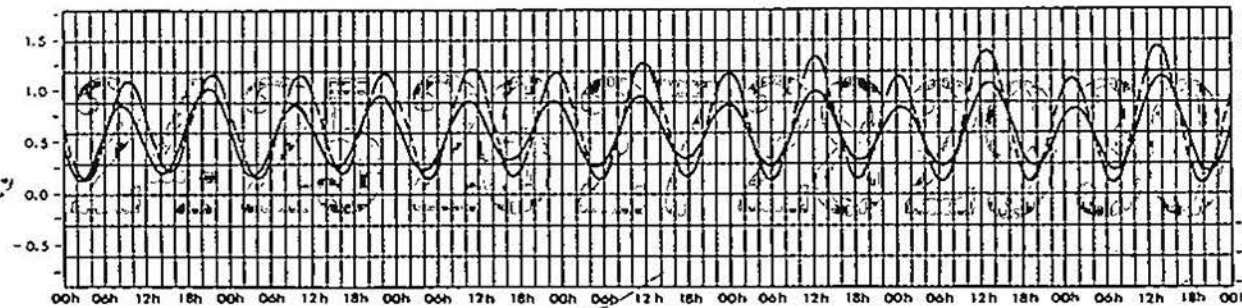
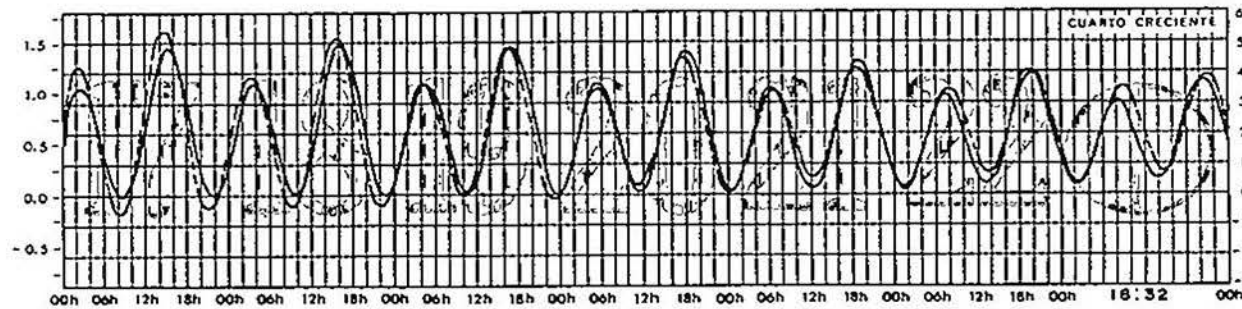
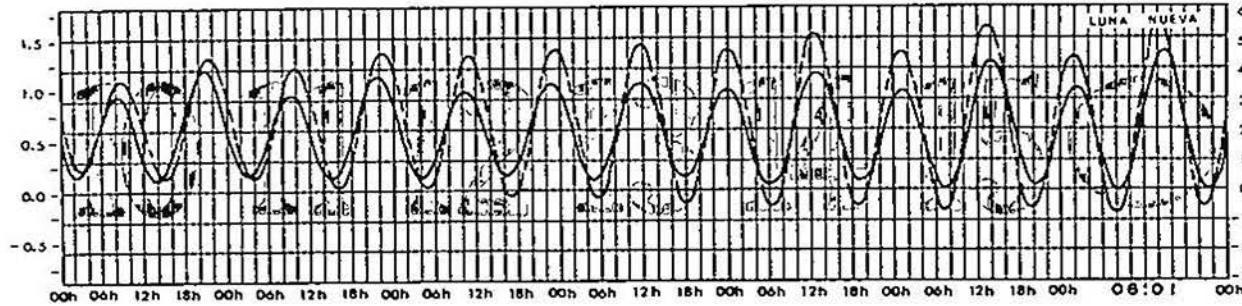
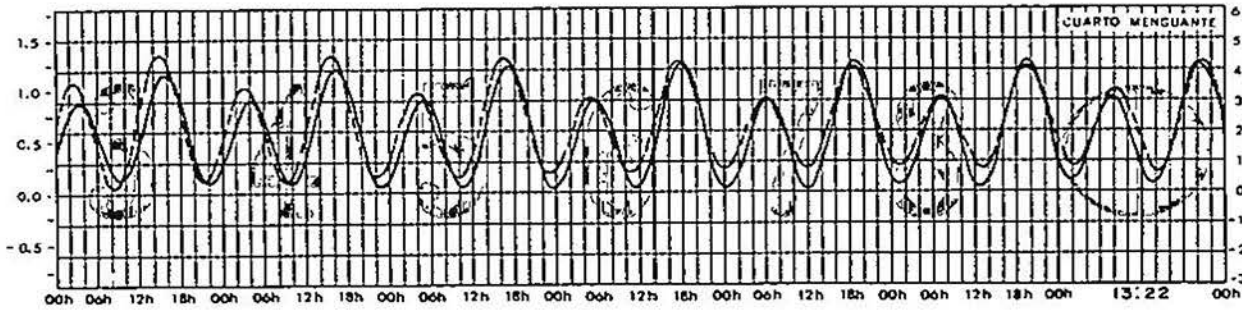
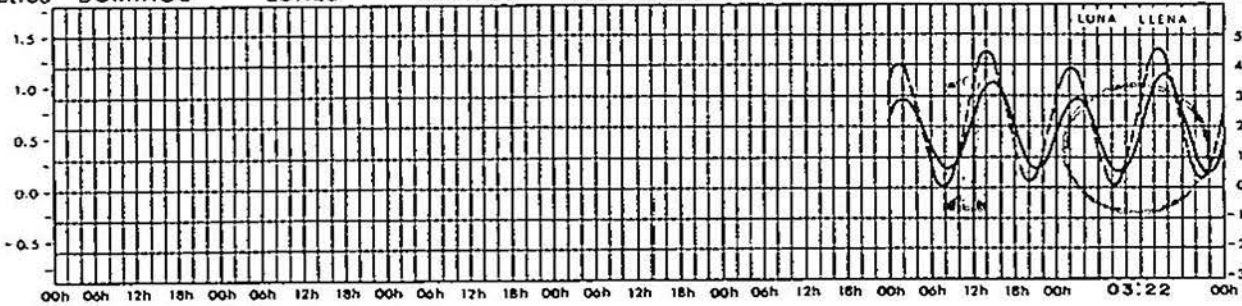
ABRIL 1988

SALINA CRUZ, OAX.
PUERTO MADERO, CHIS.



INSTITUTO DE GEOFISICA, U. N. A. M.

Metros DOMINGO LUNES MARTES MIERCOLES JUEVES VIERNES SABADO Pies



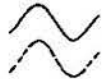
Temperatura media del mar: 26.7 °C

Salinidad media del mar: 34.7 ‰

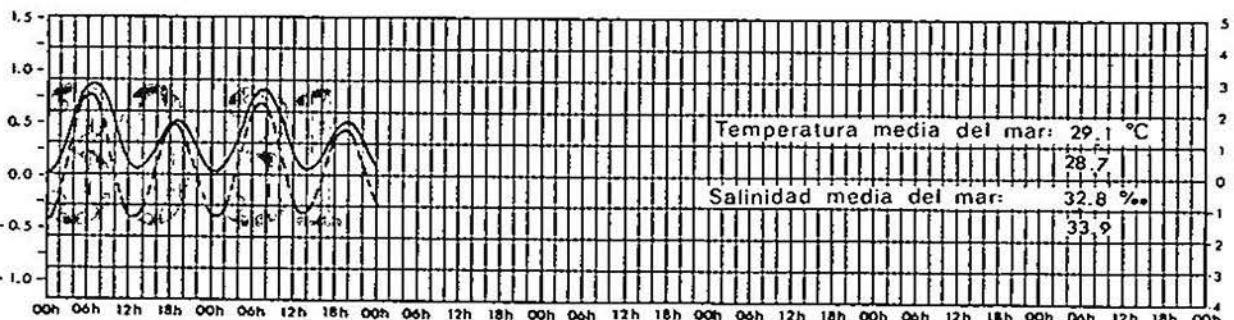
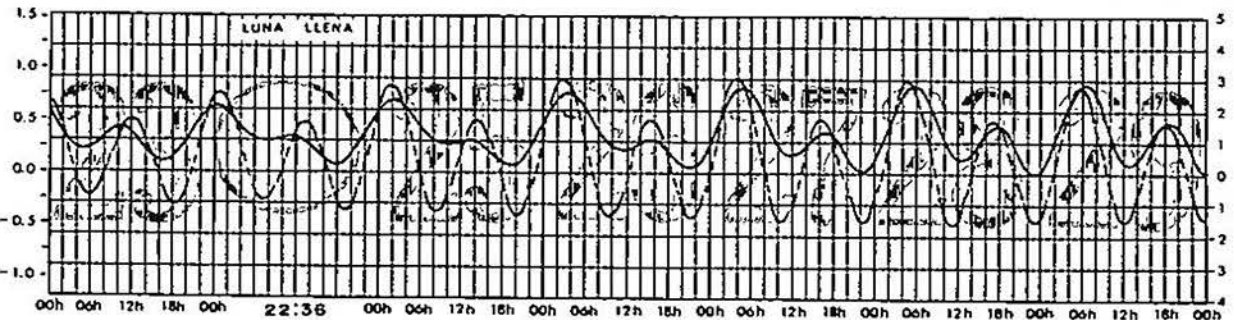
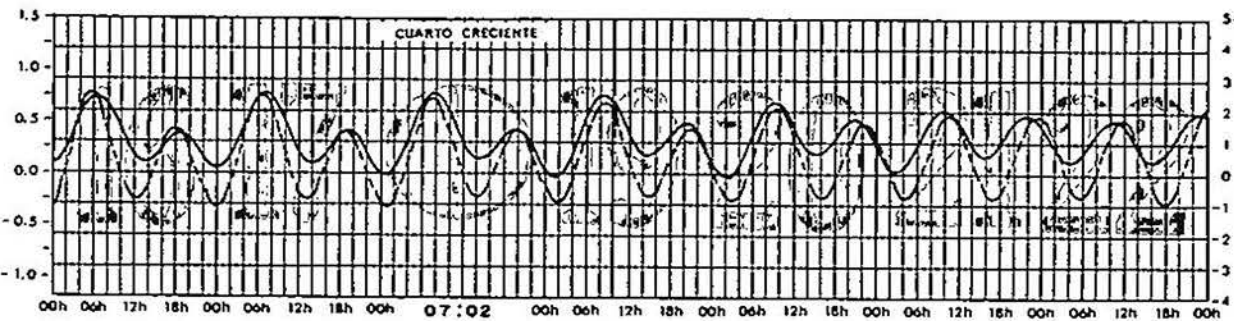
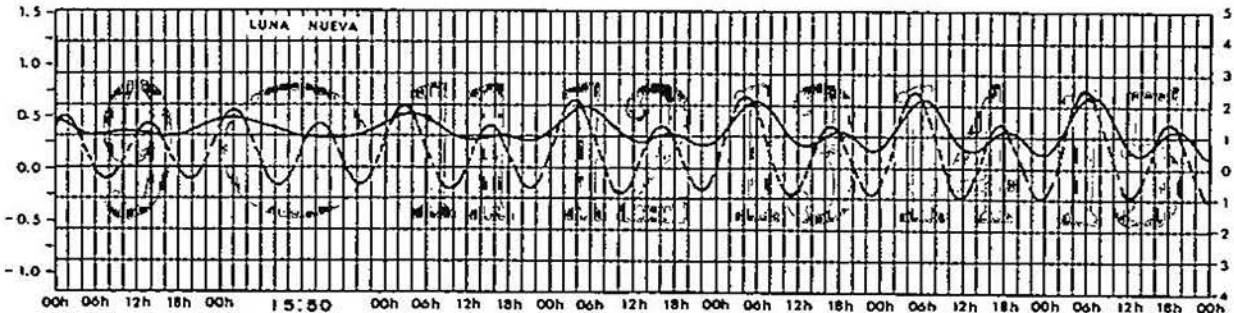
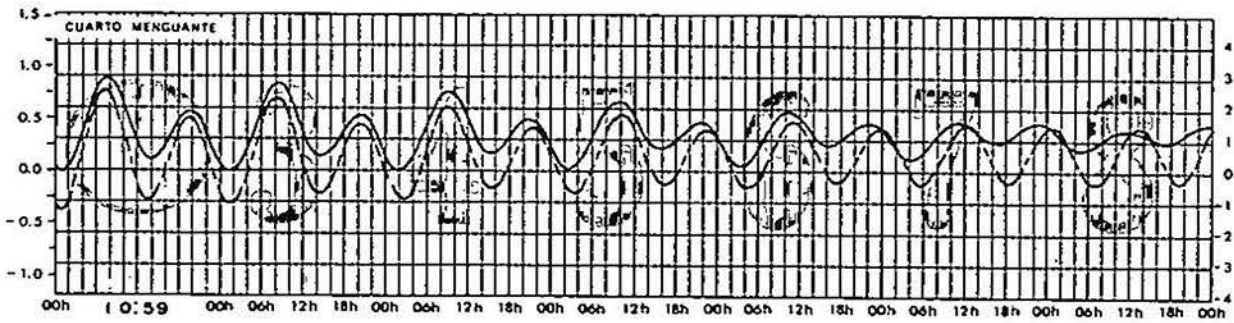
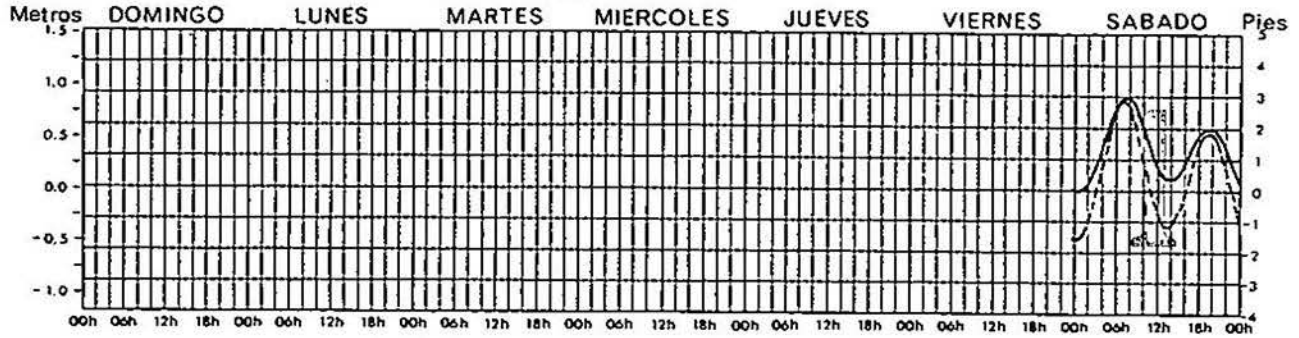


OCTUBRE 1988

ACAPULCO, GRO.
PTO. ANGEL, OAX.



INSTITUTO DE GEOFISICA, U. N. A. M.

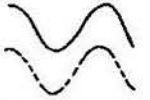


Temperatura media del mar: 29.1 °C
28.7
Salinidad media del mar: 32.8 ‰
33.9



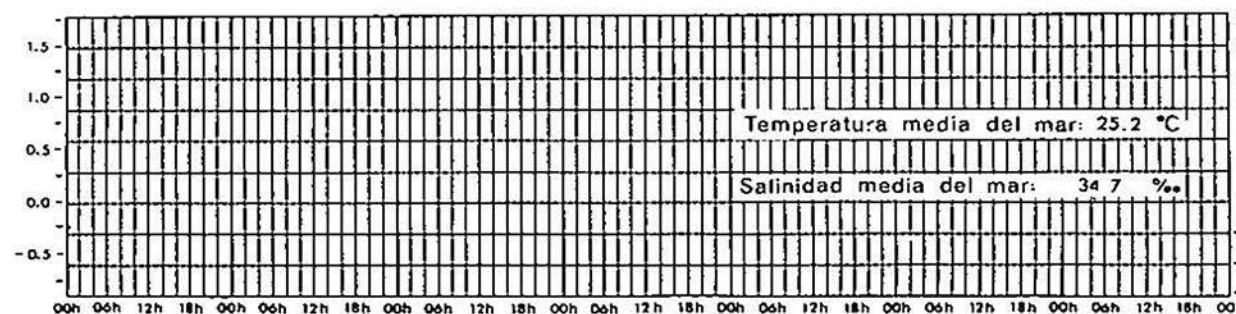
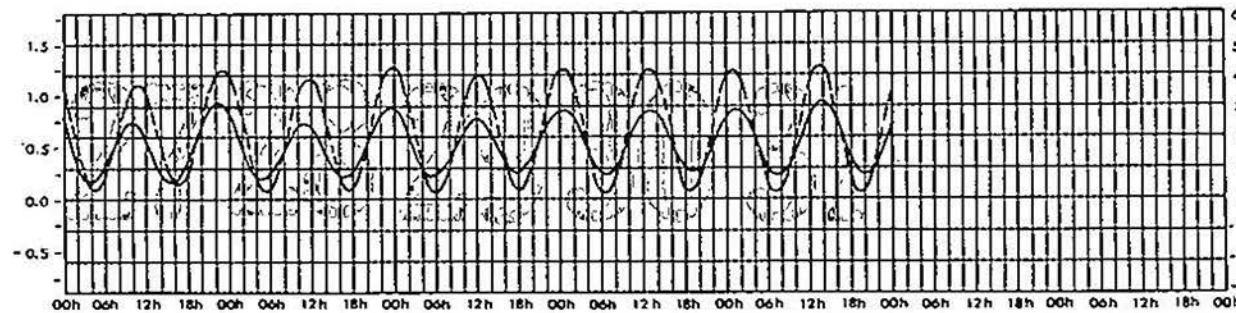
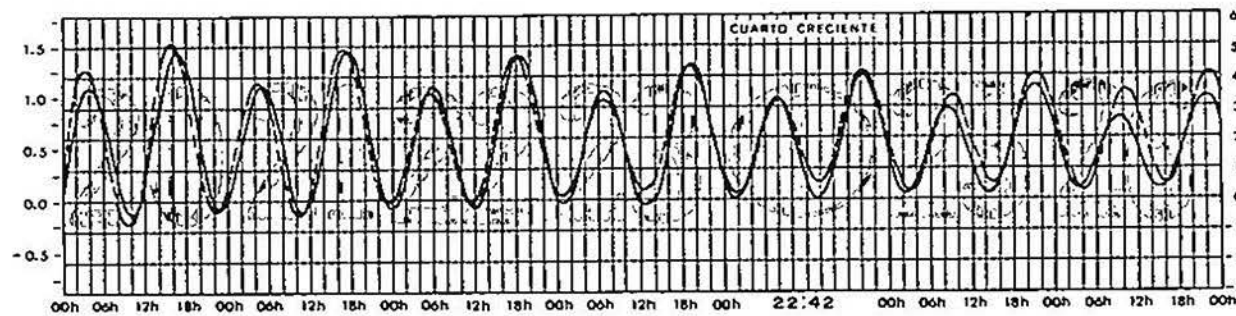
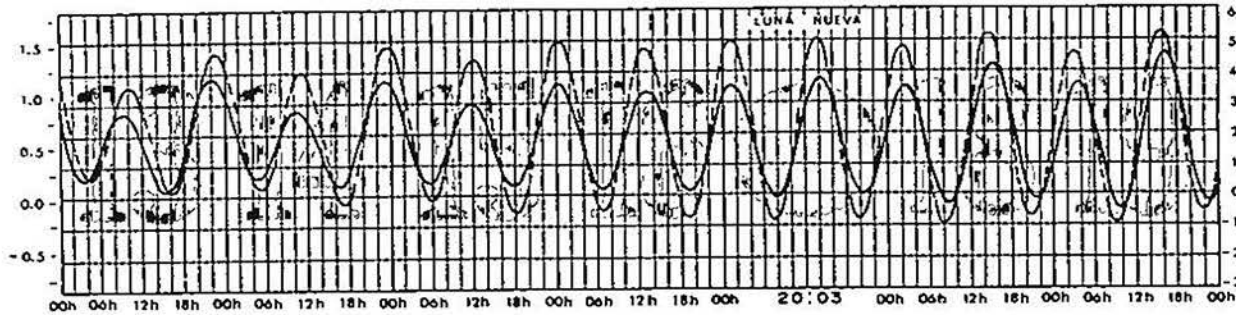
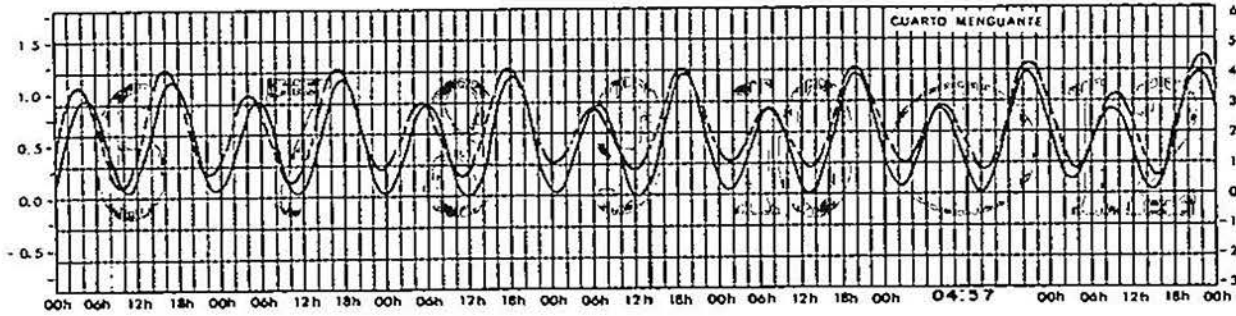
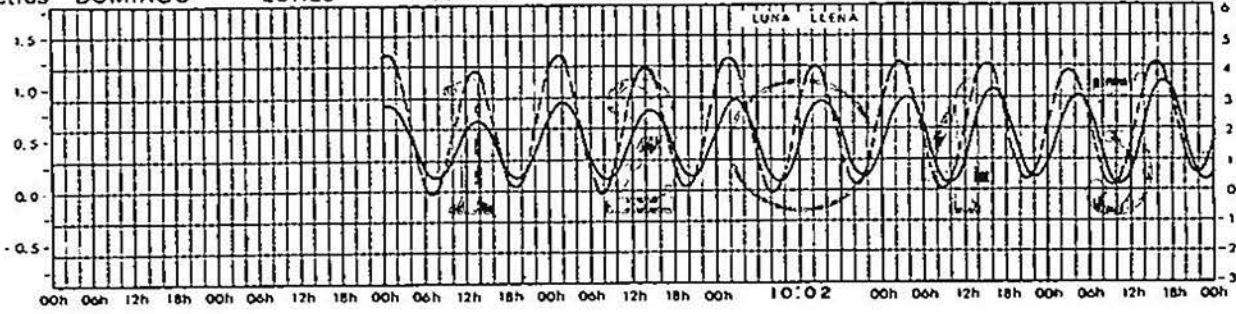
MARZO 1988

SALINA CRUZ, OAX.
PUERTO MADERO, CHIS.



INSTITUTO DE GEOFISICA, U. N. A. M.

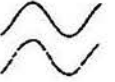
Metros DOMINGO LUNES MARTES MIERCOLES JUEVES VIERNES SABADO Pies





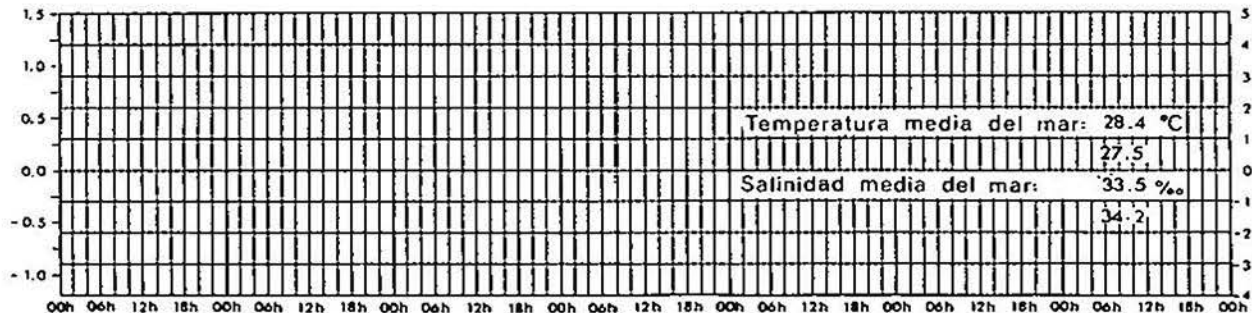
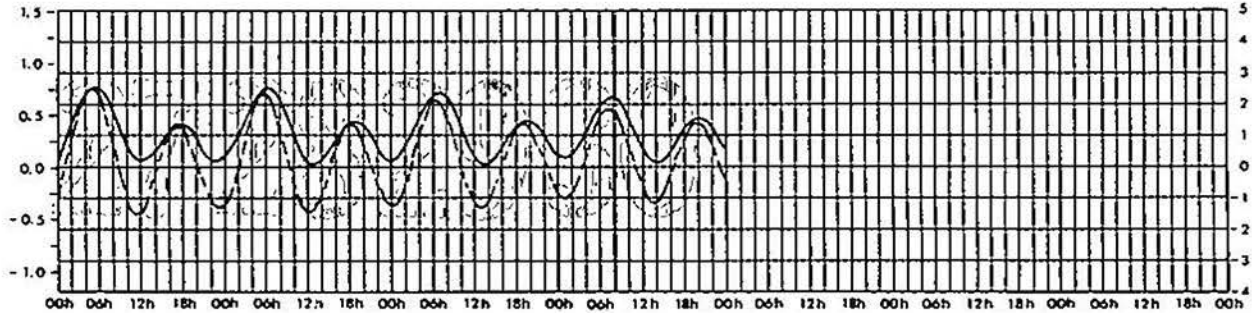
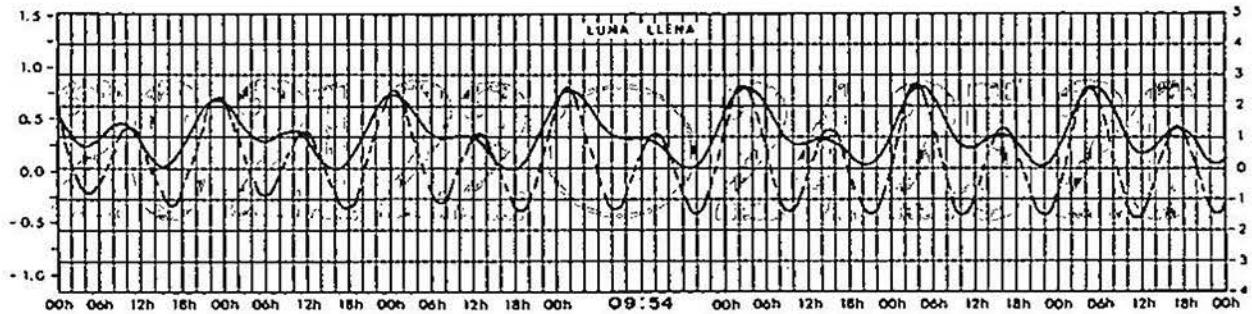
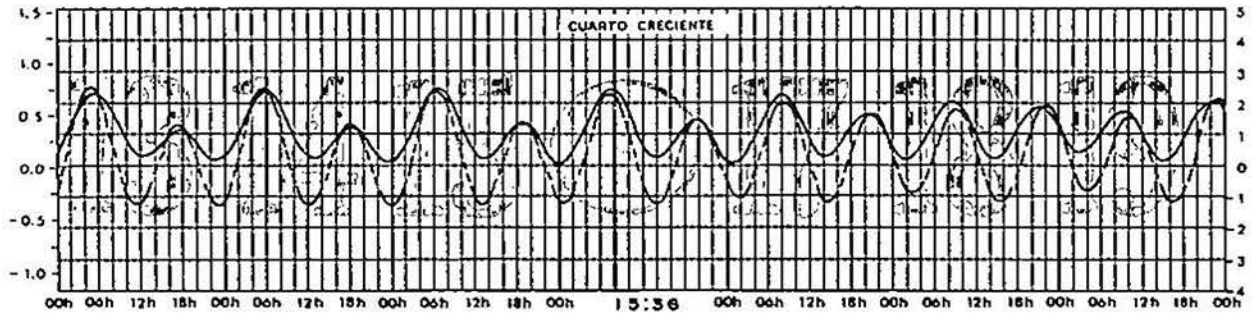
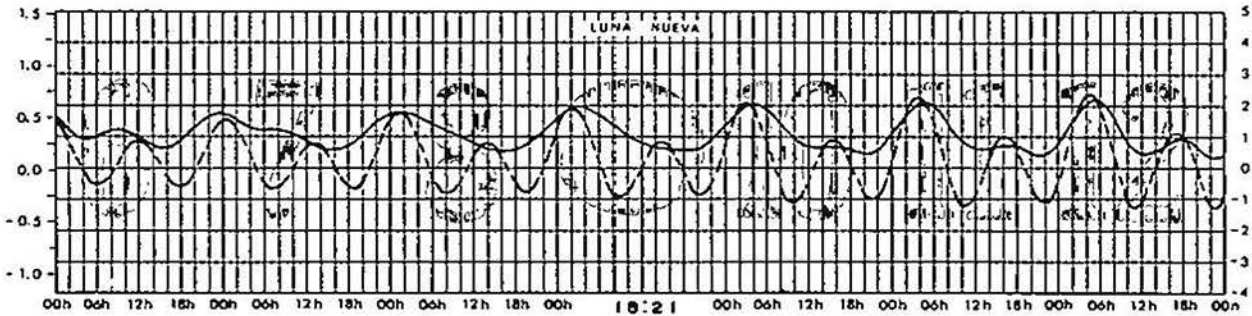
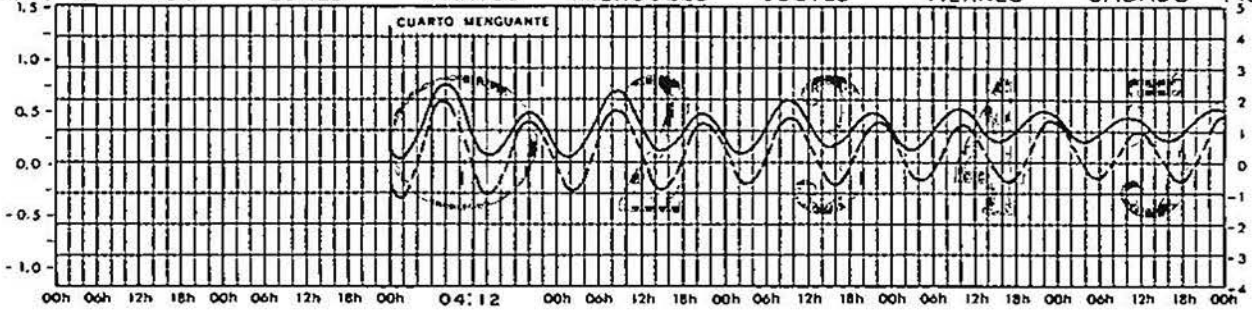
NOVIEMBRE 1988

ACAPULCO, GRO.
PTO. ANGEL, OAX.



INSTITUTO DE GEOFISICA, U. N. A. M.

Metros DOMINGO LUNES MARTES MIERCOLES JUEVES VIERNES SABADO Pies



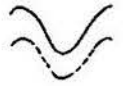
Temperatura media del mar: 28.4 °C
 27.5
 Salinidad media del mar: 33.5 ‰
 34.2



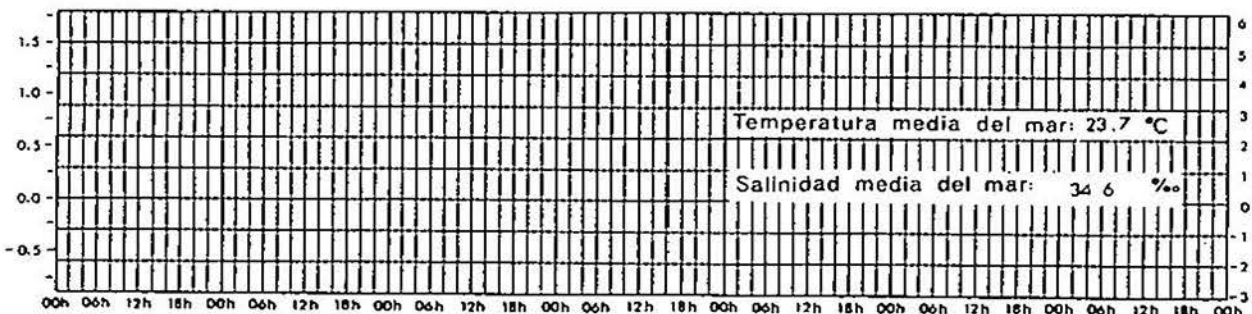
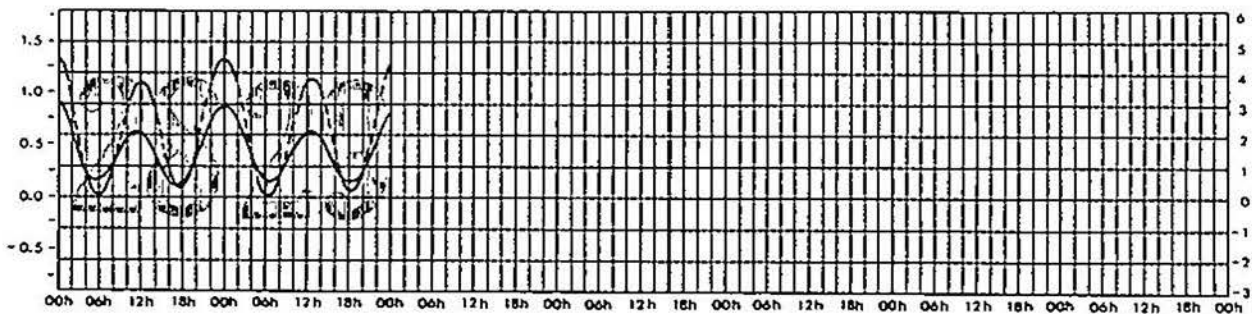
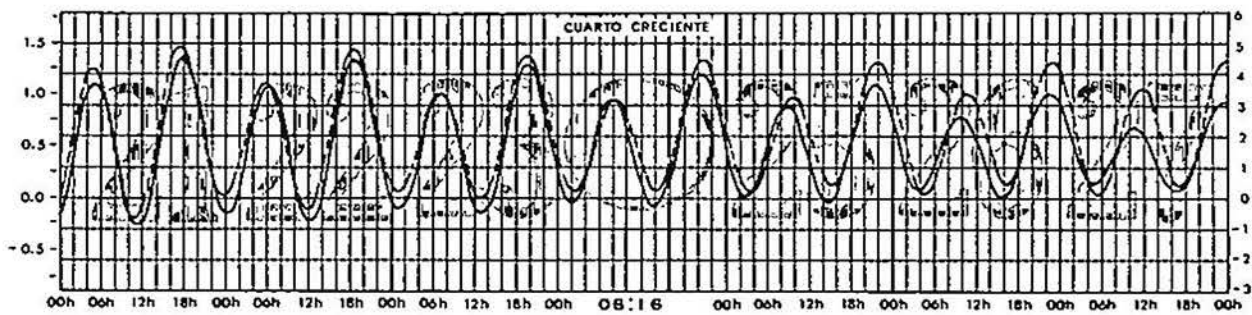
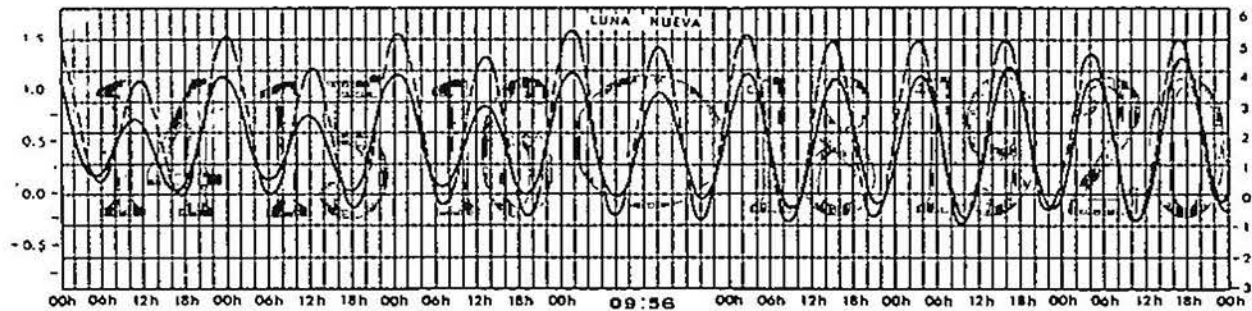
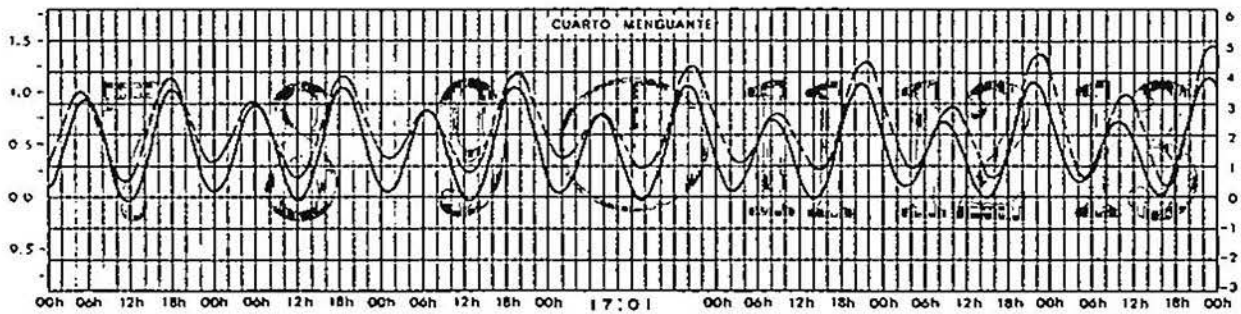
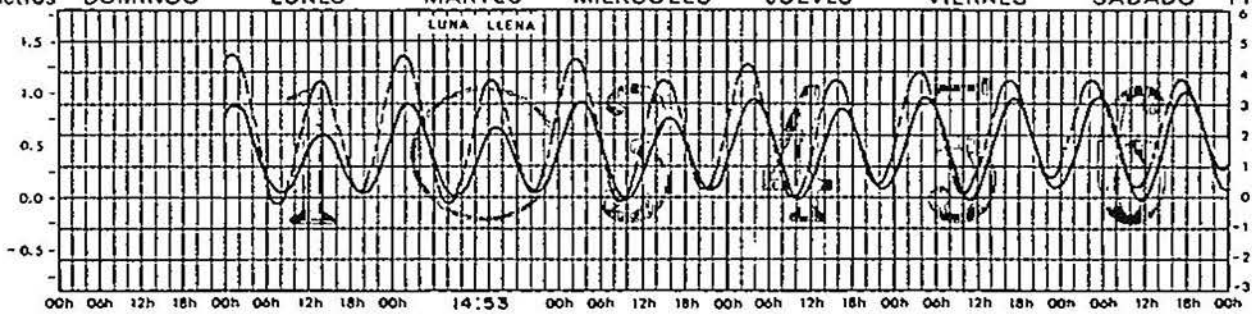
FEBRERO 1988

INSTITUTO DE GEOFISICA, U. N. A. M.

SALINA CRUZ, OAX.
PUERTO MADERO, CHIS.



Metros DOMINGO LUNES MARTES MIÉRCOLES JUEVES VIERNES SABADO Pies



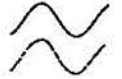
Temperatura media del mar: 23.7 °C

Salinidad media del mar: 34.6 ‰

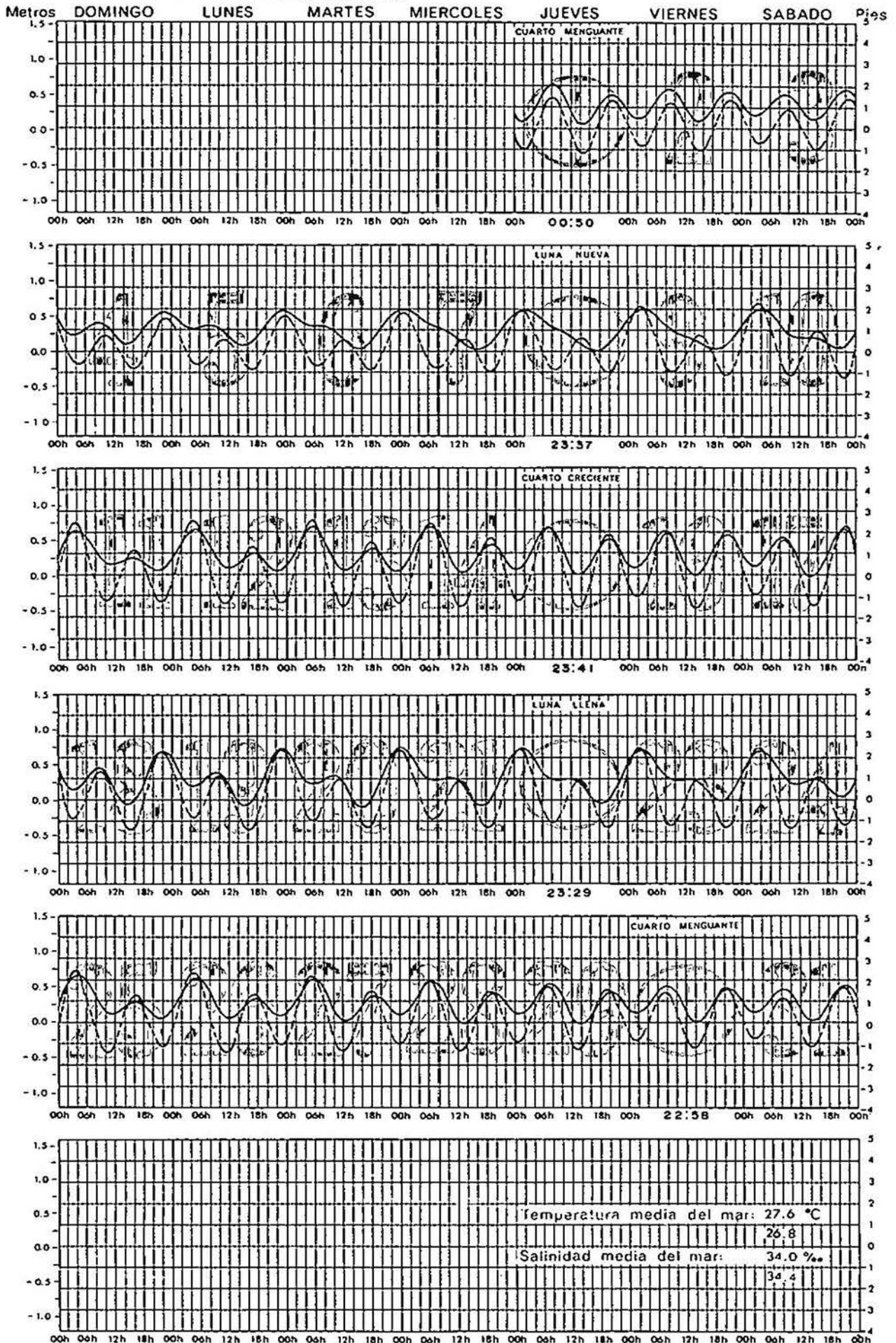


DICIEMBRE 1988

ACAPULCO, GRO.
PTO. ANGEL, OAX.



INSTITUTO DE GEOFISICA, U. N. A. M.





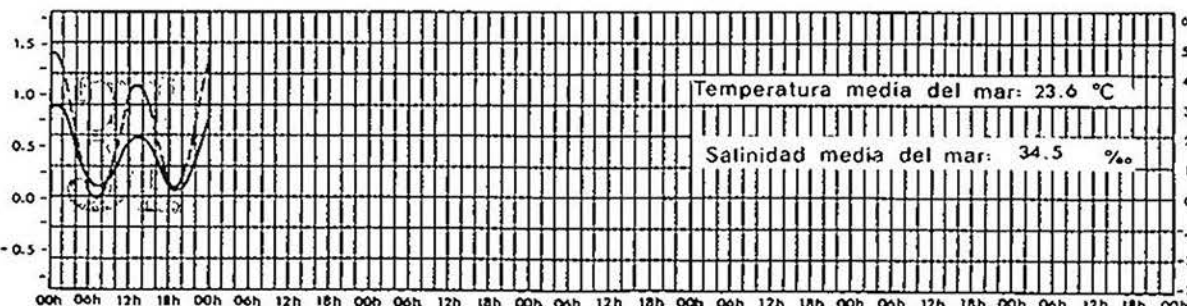
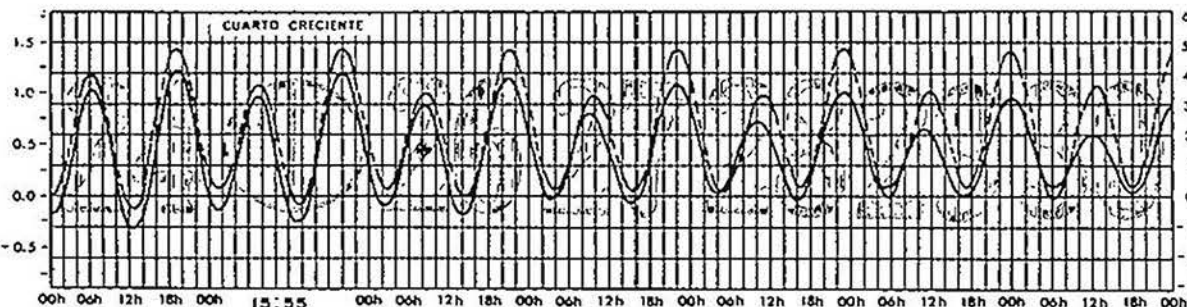
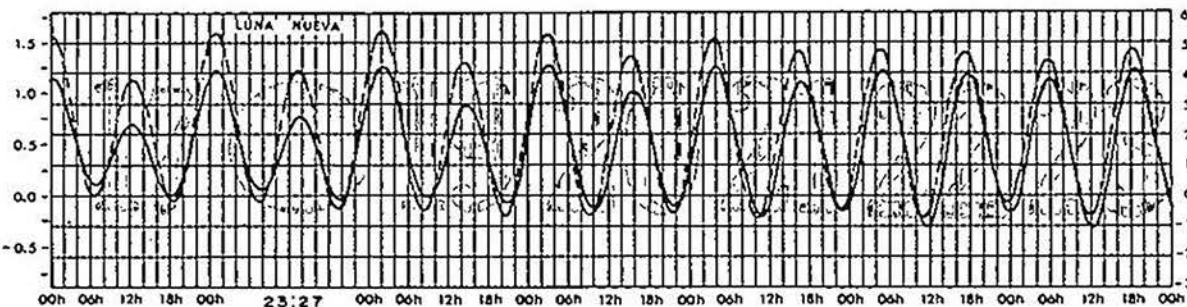
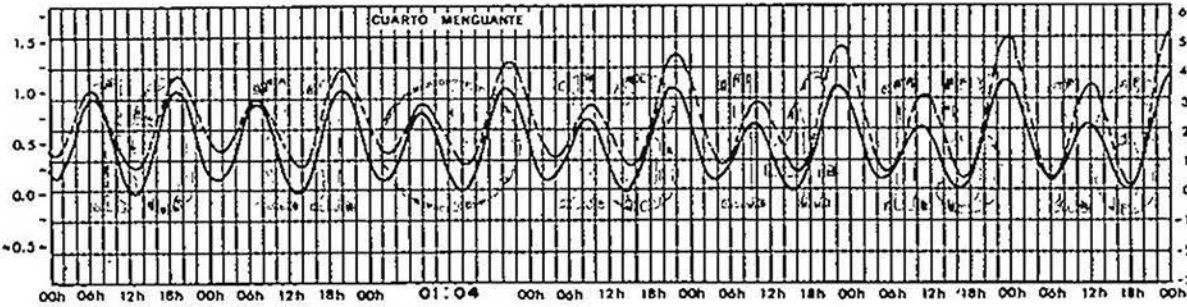
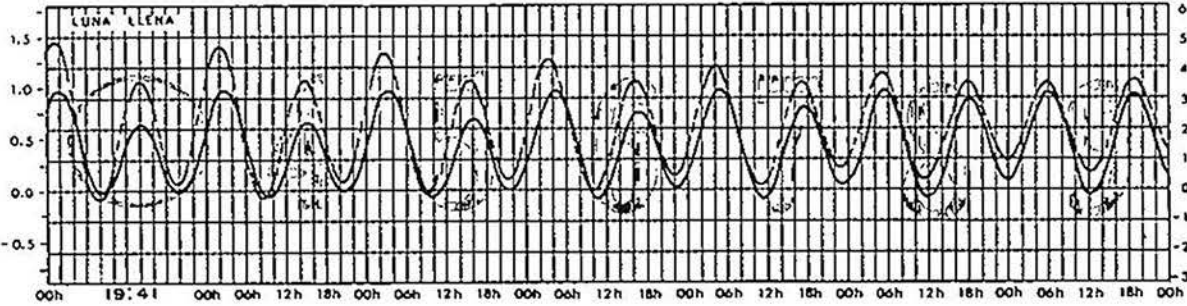
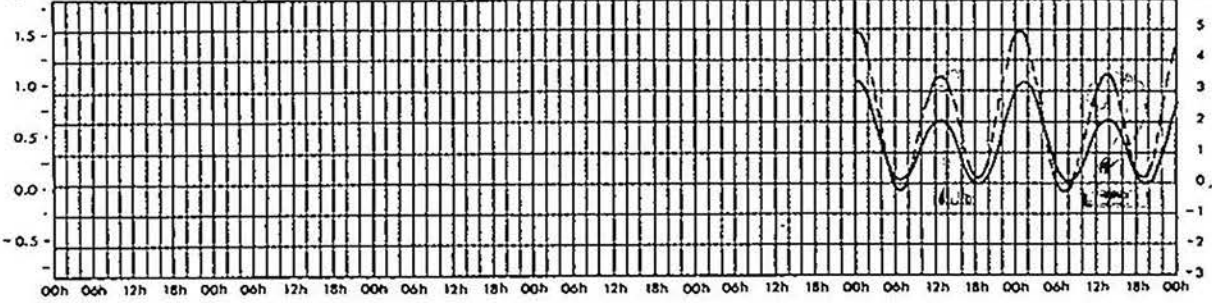
ENERO 1988

SALINA CRUZ, OAX.
PUERTO MADERO, CHIS.

VK 77,
C345
9:21207

INSTITUTO DE GEOFISICA, U. N. A. M.

Metros DOMINGO LUNES MARTES MIERCOLES JUEVES VIERNES SABADO Pies



HORA DEL MERIDIANO 90°W

PLANO DE REFERENCIA: N. G. M. L.

200-13
1.21

CALENDARIO GRÁFICO DE MAREAS, 1988

PUERTO MADERO, CHIS.

SALINA CRUZ, OAX.

CHAMPERICO, GUATEMALA

SAN JOSE, GUATEMALA

LA UNION, EL SALVADOR

PUNTARENAS, COSTA RICA

BALBOA, ZONA DEL CANAL, PANAMA.

REGIMEN DE MAREAS:

El régimen de mareas para el Golfo de Tehuantepec es mixto semidiurno, es decir, ocurren dos pleamares y dos bajamares en cada día de marea. Este Calendario Gráfico de Mareas, prácticamente puede ser utilizado en todos los lugares de la costa comprendidos desde Salina Cruz hasta Balboa, Panamá, mediante la aplicación de ciertas correcciones al tiempo y a la altura de las pleamares y bajamares (puntos máximos y mínimos de la gráfica de mareas). El movimiento total de la marea se dirige hacia el sur aumentando de amplitud rápidamente hasta alcanzar su valor máximo en el Golfo de Panamá, en cambio la fase varía muy lentamente, o sea que las horas de las pleamares y bajamares en toda esta zona casi ocurren simultáneamente.

DIFERENCIAS:

Las diferencias en tiempo y altura se aplicarán según su signo a las pleamares y bajamares de la gráfica de Salina Cruz, para obtener las del lugar deseado. Las horas encontradas estarán referidas al meridiano en uso del lugar.

ESTACIONES	DIFERENCIAS DE TIEMPO							
	Pleamar Sup. Hora	Pleamar Sup. Min.	Pleamar Inf. Hora	Pleamar Inf. Min.	Bajamar Inf. Hora	Bajamar Inf. Min.	Bajamar Sup. Hora	Bajamar Sup. Min.
Champerico, Guatemala	+00	00	+00	00	+00	00	+00	00
San José, Guatemala	+00	00	+00	00	+00	00	+00	00
La Unión, El Salvador	+00	20	+00	30	+00	00	+00	20
Puntarenas, Costa Rica	+00	20	+00	00	-00	10	+00	10
Balboa, Zona del Canal, Panamá	+01	20	+01	00	+01	00	+01	30

ESTACIONES	DIFERENCIAS DE ALTURA							
	Pleamar Sup. Pies	Pleamar Sup. m	Pleamar Inf. Pies	Pleamar Inf. m	Bajamar Inf. Pies	Bajamar Inf. m	Bajamar Sup. Pies	Bajamar Sup. m
Champerico, Guatemala	+1.1	+0.34	+1.1	+0.34	+0.0	+0.00	+0.0	+0.00
San José, Guatemala	+1.6	+0.49	+1.7	+0.52	+0.1	+0.03	+0.1	+0.03
La Unión, El Salvador	+5.0	+1.52	+5.1	+1.55	+0.0	+0.00	+0.4	+0.12
Puntarenas, Costa Rica	+4.4	+1.34	+4.5	+1.37	-0.1	-0.03	+0.3	+0.09
Balboa, Zona del Canal, Panamá	+10.5	+3.20	+10.4	+3.17	+0.4	+0.12	+1.2	+0.36

DEFINICIONES:

Pleamar Superior (P.S.): La más alta de las dos pleamares en cualquier día de marea.
 Pleamar Inferior (P.I.): La más baja de las dos pleamares en cualquier día de marea.
 Bajamar Inferior (B.I.): La más baja de las dos bajamares en cualquier día de marea.
 Bajamar Superior (B.S.): La más alta de las dos bajamares en cualquier día de marea.

NOTA: Cuando en determinado día del Calendario las dos mareas altas o las dos mareas bajas del mismo día fueren iguales en altura, puede escogerse cualquiera de ellas como la pleamar superior o la bajamar inferior.

Si la marea pasa a ser diurna y solamente ocurren una pleamar y una bajamar, ambas deberán considerarse como pleamar superior y bajamar inferior.

TIEMPO:

La hora usada para la predicción de mareas para Salina Cruz, Oax., es la del meridiano 90° W. Se cuentan desde las 00 horas que corresponden a la media noche.

PLANO DE REFERENCIA:

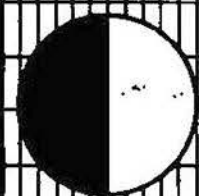
El plano de referencia que está bajo el nivel medio del mar, al cual están referidas las alturas, es el nivel de bajamar media inferior =

SALINA CRUZ, OAX. 1.9 pies (0.58 m).

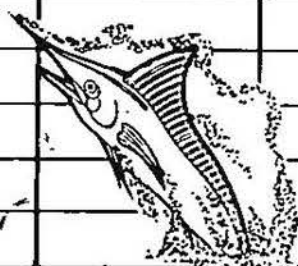
PUERTO MADERO, CHIS. 2.3 pies (0.70 m).

Ing. Fco. Grivel Piña
 Instituto de Geofísica,
 U.N.A.M.

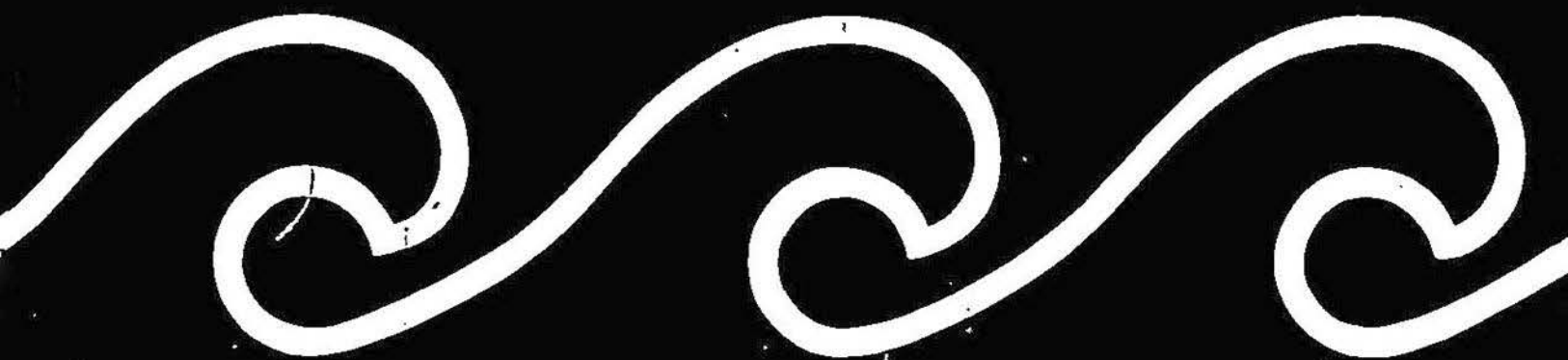
INSTITUTO DE GEOFISICA



Calendario Gráfico
de Mareas



1988



Salina Cruz, Oax.
Puerto Madero, Chis.