

Pacific Climate Change Science Program



**Ikenai me Nesor ren usun nonomun
fonu, sat, me fan lang non FSM**



- > Federated States of Micronesia National Weather Service Office
- > Australian Bureau of Meteorology
- > Commonwealth Scientific and Industrial Research Organisation (CSIRO)



Australian Government

Nonomun me fetanen enienin asapwan me pwichin fonu non Micronesia ikenai

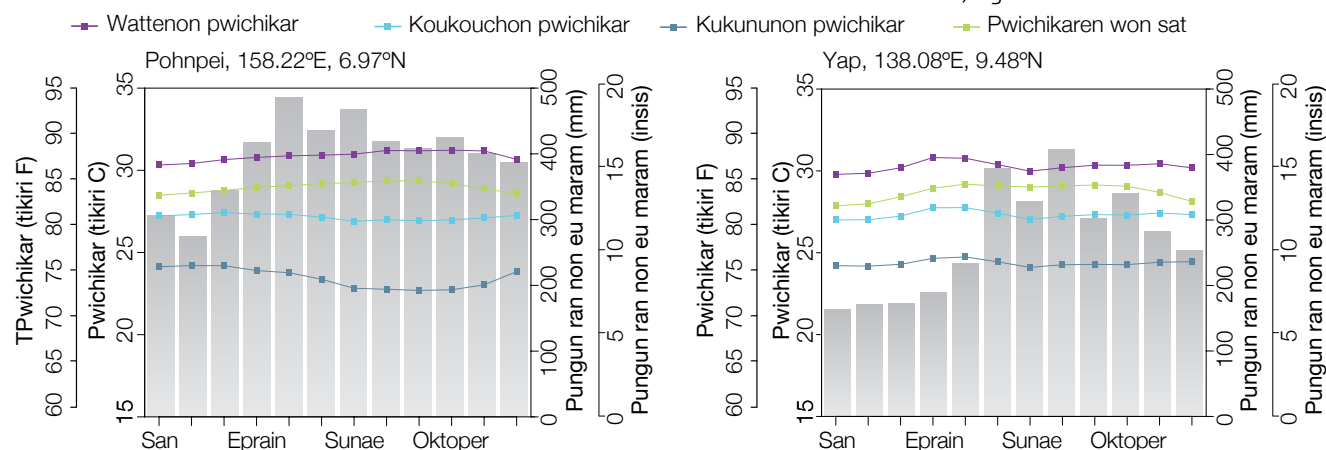
Non FSM, ese watte ekesiwin wattenon me kisinon pwichin me paten a chok kukun seni 3 tikiri (1.5 selsius) nefinen fansoun an epwe pwichikareno me fansoun an epwe pateno. A wor ruu sakun nonomun fonu me sat; eu a wor fansoun pwichikar a fis nefinen Nofemper ngeni Eprain, arruan fansoun nukuchochon a fis nefinen May ngeni Oktober (nengeni esisin. 1)

Pungun ran non FSM a chok anongonong won mokutukutun asapwan me noo unukun ewe ikiweitor (ITCZ). Ei muchochun raningaw a fis seni ioion pwichikaren won sat fengen me noongaw o a tongeni forata mannunun kuchu mi esinipato fifi me pach are chopunap. Ei mochuchun raningaw me watten kuchu a nom asan ika asetana ewe ikewitor (fig 2). Fansoun patapat ika raningaw a fis nupwen ewe (ITCZ) eu muchochun asapwan me noo ra pochokununo ika wattenno iwe ra mokut eta ika nom asan FSM. Ewe (West Pacific Monsoon) asapwanin notou non Pacific a tongeni awattenno

pungun ran are fansoun raningaw. Ei asapwanin notou, a fis seni watenon sakofesenin pwichikar fonu me sat, ei watten ekesiwin ren pwichikaren fonu me sat a fis a tongeni forata wattenon raningaw non ekkoch fansoun.

Fefetanin me nonomun fonu me sat non FSM ra sakofesen year me year seni ewe (ENSO) ekesiwinin wattenon me kukunon pwichikaran asapwanin ottiw me notou fiti fengen me pwichin me paten won sat. Ei napanapen ekesiwin ren pwichikaren me patan won sat non ottiwen me notoun non Pacific, eu napanap a chok fifis, o iei met a tongeni forata

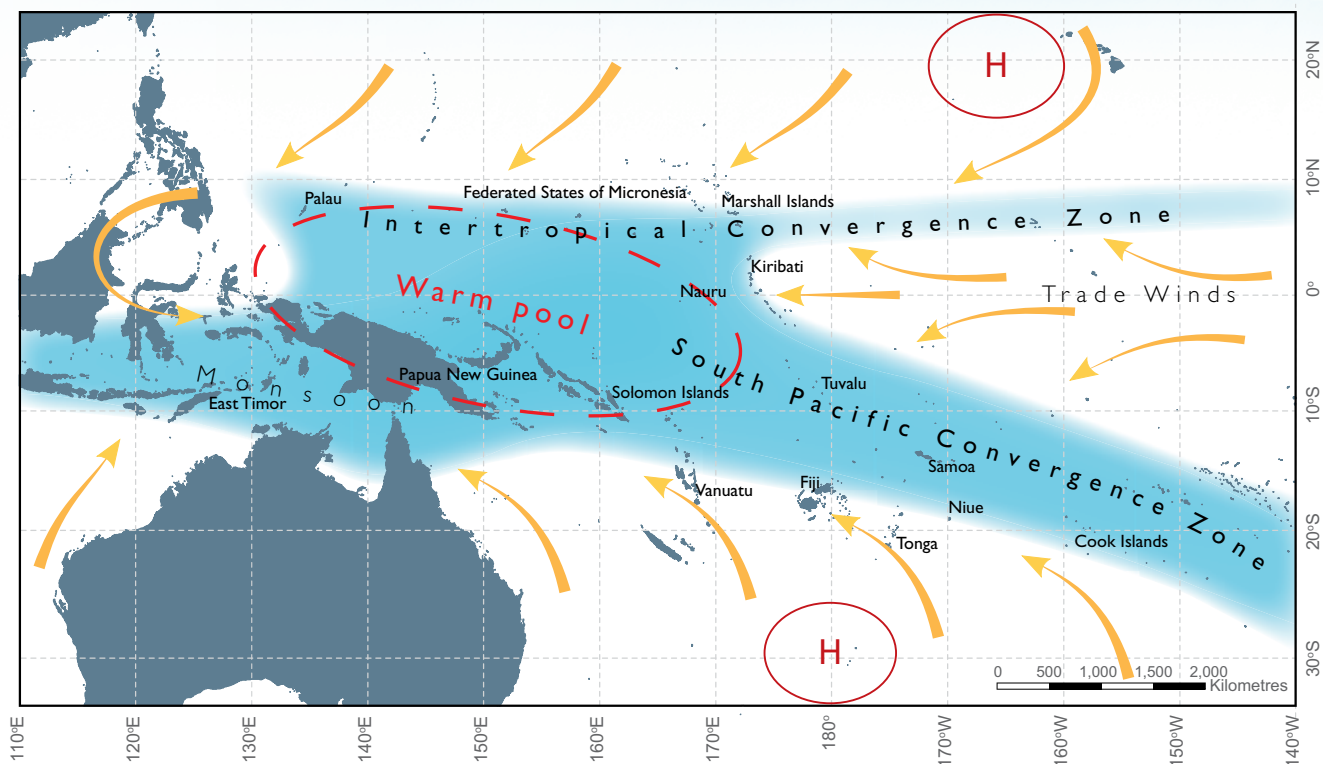
nonomun mokutukukun enienin asepanin fonu me sat non fonufan. Ekkei ruu napanap ren pwichikareno me pateno asapwanin ottiwen me notoun Pacific sia tongeni weweiti ika a pwichikareno a iteni (El Nino) me atun pateno a iteni (La Nina). Non Pohnpei, mei fis eu fansoun nge ese pwichikareno ika ese pateno. El Nino a tongeni forata pwichikar nap seni pwichikar, nge mi fen pual tongeni wattenno raningaw, nap seni raningaw. La Nina, a tongeni forata an epwe fen pual tongeni wattenno pungun ran nupwen fansoun pwichikar. Ewe asapwanin notou a tongeni epwe forata osukosuk ngeni fonuen Chuuk me Yap nap seni founen Pohnpei me Kosrae. Ei asapwanin notou a tongeni an epwe mokut ngeni otiw fansoun El Nino, o forata wattenon pungun ran, iwe nge epwe niwiniti notou nupwen La Nina fiti kukunon pungun ran. Ren ewe ITCZ epwe kukununo pungun ran fansoun El Nino, nge wattenno fansoun La Nina.



Esisin 1: Nonomun pungun ran me pwichikarenon non Pohnpei me Yap.



Nenien inen waa, Pohnpei.



Esisin 2: Koukun me nenien ekkewe mettoch ra forata ekesiwinin nonomun fonu me sat seni Nofemper ngeni Eprain. Ekkewe eerier ren asapwanin won fonu me sat, ewe mi arau eerier a esisinata muchochen raningaw, ewe mi chok erino a aiti ngeni kich usun eu muchochun pwichikaren ioien asapwanin notou, ewe H a aiti ngeni kich usun asapwanin asan.

Ekkewe mettoch mi afeingaw ngeni fonu me aramas

Pwaas, taifun, noo watte, nononon neni, me sonun pun ra fakkun afeingaw ngeni fonuen FSM. El Nino ra forata pwichikaren neni me pwaseno fonu. Ekkeei, osupwang konik me osupwangen mongo ra fis nupwen a watteno pwasen neni. Nupwen La Nina a esinapato chommongeno watten asepan non FSM..



Johannes Berdon, National Weather Service Office

Tanon neni seni watteno noo, Oneop, Chuuk.

Ekesiwinin nonomun enienin asepan, pungun ran me pwichikaren non FSM.

Pwichikar a watteno

Koukun pwichikar are napanon pwichikar me kukunon pwichikar a wate ekisiwinino non Pohnpei seni ewe year 1952 (fikur 3). Watteno pwichikar a watteno ren ukukun chok 0.19 tikiri F (0.10 tikiri C) non ukukun engon year. Ei watteno pwichikar a pungfengen me met fonufan a fen nenengeni.

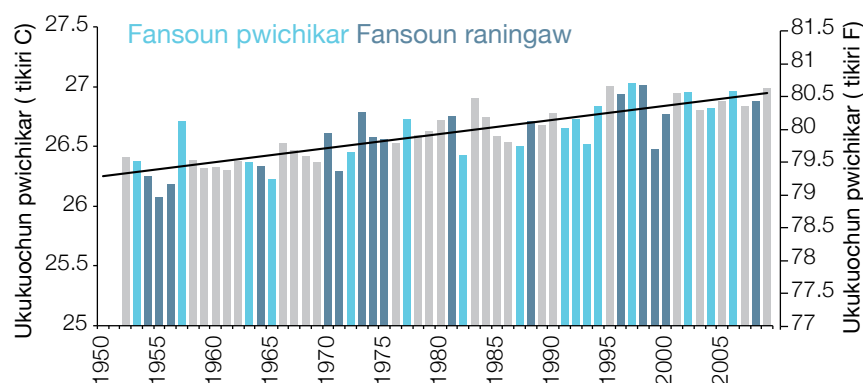
Koukun pungun ran no Pohnpei a kukununo.

Seni 1950 ren Pohnpei tori ikenai sia kuna pwe pungun ran a kukununo (esisin 4) nge renpwichikar ese kon nien fatafatoch. Ren Yap ese wor met epwe pwarata usun ekisiwinin pungun ran. Nge non ekkei fansoun sia kuna pwe pungun ran non ekkei ruu neni mei chok ekisiwin napanapan, watteno ika kukununo.

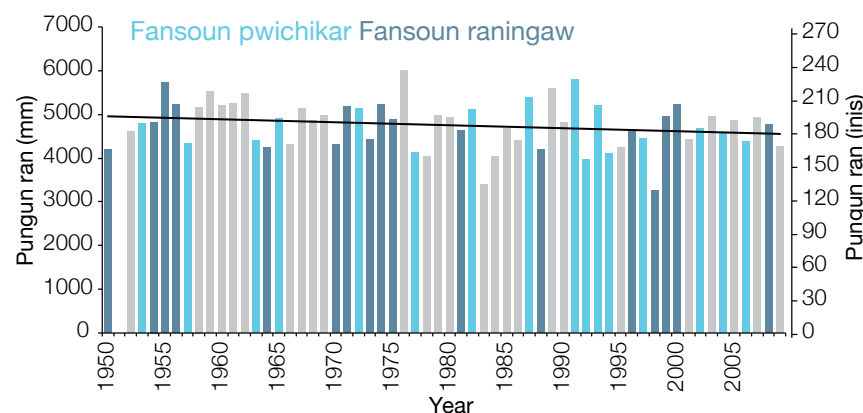
Sat a tekiano

Fan iten an sat a pwichikaren, iei met a forata an sat a poota are tekiano. Teninon ekkewe founmongun me choon ice ra pual forata an sat a tekiano.

Ekkewe satellites me ekkewe nenien nengeni mokutukutun sat (tide gauges) ra tongeni pual aiti ngeni kich usun mokutukutun me napanapan usun setich kewe. Ekkei mwesin are pekin nengeni ra aiti ngeni kich nge pwe a ukukun 0.39 inis (10 mm) ren eu year tekianon sat seni non ewe year 1993. Ei ukukun ai aiti ngeni kich nge ei kouk a nap seni ukukun koukun tekianon sat non fonufan (0.11- 0.14 inis (2.8- 3.6 mm) non eu year. Ei watteno tekianon sat non fonuach mei tongeni pwe a fis seni pwisin met a fis non neniach kei non ekkei year ika nefinen engon year seni nom tori ikenai ika esinapan El Nino- Southern Oscillation.



Esisin 3: Koukun pwichikar non Pohnpei. Ewe eerier mi araw a aiti ngeni kich usun El Nino, ewe eerier mi choon a aiti ngeni kich fansoun La Nina, iwe ewe mi anuotop a aiti ngeni kich fansoun nuua, ese wor met a fis



Esisin 4: Ukukun ran no Pohnpei eu year. Ewe eerier mi araw a aiti ngeni kich fansoun El Nino year, ewe eerier mi arawechon a aiti ngeni kich ekkewe yearin La Nina, pwe ewe eerier mi toputop a aiti ngeni kich fansoun nuua, ika ese met a fis.

Watteno chonungaweno sat (acidification)

Ina epwe ukukun eu neranu (1/4) carbon dioxide a tou seni aramas a mochuno non ewe sat iteiten year. Nupwen a watteno ei carbon dioxide ika ei och sakkun kas non ewe sat, a forata an ewe sat epwe ne chonungaweno. Iei met a tongeni forata an epwe angaweno manawen ekkewe ooch me monun non sat, iwe a tongeni forata kokotongawen manawen man me iran neset; o a tongeni angaweno ach kewe ooch. Taropwe a pwarata pwe seni ewe 18th century koukun ewe chonungaw a watteno non setin FSM.



Fansoun auku pwichikar, Pohnpei Weather Service Office.

Met epwe fis ren nonomun fonu me sat non Federated States of Micronesia

Nonomun fonu me sat non FSM ra tongeni ekesiwini usun nonomun aramas non FSM. lei popun ach weweiti usun met epwe fis nesor me pennon a tongeni anisi aramas me ach mu ar repwe sinei met repwe fori me akotat ren tumunun nonomun manauen aramas nesor me pennon.

Ifa usun an ekkewe mi sinenapei usun nonomun fonu me sat anapanapa

usun mokutukutun non neniach

Ekkewe pisekin nenengeni usun nonomun fonu me sat ra tongeni anisi kich ach sipwe weweiti usun nonomun me mokutun fonu me saat. Ekkei pisekin nengeni ra anongonong won pekin aritmetikiei met a tongeni forata ekkewe computer mi fakkun tipachem. Ekkei sakun mwesin ika computers ra anongonong won ekkewe tipachemen a fis seni weweiti usun napanapan me mokutukutun fan lang, won sat, won fonu tori ekkewe foun ice.

Mei chommong pekin nenengeni usun climate non fonufan nge mi wor ar sakofesen. Ekkewe scientists seni ewe Climate Change Science Program (PCCSP) ra aea ukukun 24 sakkun napanapan nenengeni usun climate, 18 me neir ra aea ne nenengeni non notoun Pacific. Ekkei 18 pisekin nenengeni ra aea ne nenengeni napanapan me mokutukutun climate non FSM.

Mokutun me nonomun nesor ren sia tongeni weweiti ren ach sipwe nengeni metekewe mi pusin fifis me pual metekewe kich aramas sia fofori ra tongeni pual anapano ika ekesiwini usun nonomun me mokutun fonu

me sat. Pokiten sise tongeni sinei met porausen nesor, sia tongeni chok anongonong won met a fen fifis ach sipwe tongeni anapanap epwe ifa usun porausen nesor me pennon. Ewe eu kinikinin non government a iteni (IPCC) a fori ekkoch anapanap anongonong won met epwe fis ngeni aramas mwach kan, nonomun tufichin fonu, me kanepenon tufichin ekkewe pisekin nenengeni. Awewe, ewe A1B (ika medium) ren usun pwichikar mi tou seni fonufan non fansoun ra chommongono aramas me met epwe fis murin nupwen aramas repwe chokukununo, ika pual fansoun watteno tufichin nonomun fonu, me pual ochunon me murinno non ekkoch pisekin angang. Ekkewe sakun kas a forata pwichikaren fonu, a wor ekkoch pisekin nengeni sia tongeni aea ach sipwe weweiti met epwe tongeni fis mwachkan.

A wor unungat napanapan ach nenengeni usun climate non FSM. kukunonon (B1), nefinan (A1B) me wattenon (A2) seni 2030, 2055, me 2090. (Esisin 5). Pokiten eu me eu ekkei pisekin nengeni mei sakofesen ren met ra pwarata, sia tongeni chok aea ach sipwe nengeni me weweiti met epwe fis nefinen ekkei fansoun.

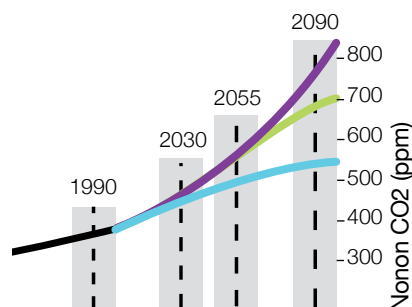


Figure 5: Nonon Carbon dioxide (CO₂) (kinikinin ren eu million, ppm) fiti fengen me unungat IPCC napanapen niwininuoun pwichikar, kukunon pwichikar tou (B1-arau), ukukuochun niwininuoun pwichikar (A1B- enuen fetin) me wattenon pwichikar mi tou seni



Fansoun kaeo ngeni pekin Climate non ewe offesin Weather Service, Pohnpei.



Tanon pisek seni watteno sat, Lekiniach, Chuuk.

Usun me nonomun fonu me sat non fonuen Federated States of Micronesia

lei mesenapen nonomun climate ren FSM. Ren napenon porausen kopwe nengeni Volume 2 ren ewe Climate Change non Pacific. Minafon pekin nenengeni me ewe web-based ren napanapen climate tori ewe Pacific Climate Futures ra nom won ewe www.pacificclimatefutures.net.

Pwichikar epwe
fetan ngeni an
epwe wattenno

Pekin nengin ra aiti ngeni kich nge
pwichikar enienin asapwan tori
pwichin won sat repwe wattenno non
ekan ran mwach non FSM (chepen
1). Non 2030, non eu anapanap
ika pwe e pwichikareno, iwe epwe
napeno ren ukukun 0.7 -1.9 tikiri F
(0.4 -1.0 tikiri C) napengeni epwe
fis otuen fonuen Federated States
of Micronesia, me pual 0.8 -1.8
tikiri F (0.4- 1.1 tikiri C) notoun
Federated States of Micronesia.

Ran nupwen epwe fakkun pwichikar

Watteno pwichikar epwe forata an
epwe chommongono ran repwe
pwichikareno, nepwin epwe pual
pwichikareno, patapat epwe pual
pwichikareno, patapat epwe pual
kukununo.
nengeni ra tongeni nengeni nefinen ewe year 1980 ngeni 1999.

Ekesiwinin napanapen
pungun ran

Meinisin ekkewe pisekin nengeni ren climate, ra aiti ngeni kich nge ukukun pungun raan me fansoun pungun ran epwe napeno non 21st century. Iwe nge esap wewen nge iei met epwe fis pokiten mi wor ekkoch ekkewe pisekin nengeni mi sakoseni pual ekkewe ekocho. Iwe ra nengeni nge pwas non ei century ika non ei fansoun epwe kukunungo.

Fansoun an epwe
watte pungun raan

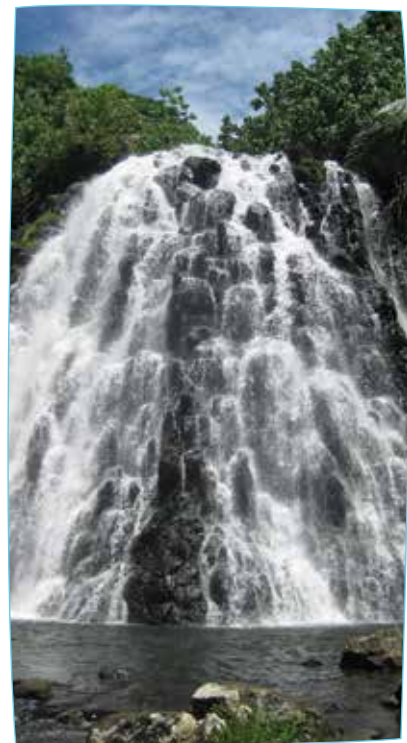
Pekin nenengeni ra aiti ngeni
kich nge epwe watteno
fansoun pungun raan.

Fansoun kukunnon
asepwan ika taifun

Anongonong won an fonufan
nenengeni, napanapan nge epwe
kukununo taifun tori muchunon ei
21st century. Mei tufich nge epwe
watteno pochokunen asepan non
taifun nge epwe nefinen 2% ngeni
11% me watteno pungun ran seni
20% seni non eu taifun tori 100km
seni nukanapan ewe taifun.

Federated States of Micronesia
e nom non ewe kinikin ikewe ie
epwe kukununo fansoun an epwe
wor asepan watte ika taifun.

	2030		2055		2090	
	(°F)	(°C)	(°F)	(°C)	(°F)	(°C)
Otiwen FSM						
Kukunun pwichikar tou	0.4–2.0	0.1–1.1	1.1–2.9	0.6–1.6	1.5–4.1	0.9–2.3
Ukukuochun pwichikar tou	0.5–2.3	0.3–1.3	1.6–3.8	0.9–2.1	2.7–5.9	1.5–3.3
Wattenon pwichikar tou	0.7–1.9	0.4–1.0	1.8–3.4	1.0–1.8	3.9–6.3	2.2–3.4
Notoun FSM						
Kukunun pwichikar tou	0.4–1.8	0.2–1.0	1.0–2.8	0.6–1.6	1.4–4.0	0.8–2.2
Ukukuochun pwichikar tou	0.6–2.2	0.4–1.2	1.7–3.7	0.9–2.1	2.6–5.8	1.4–3.2
Wattenon pwichikar tou	0.8–1.8	0.4–1.1	1.7–3.3	1.0–1.8	3.8–6.2	2.1–3.5



Ewe pupun konik Kepirohi, Pohnpei.

Tekian won sat epwe watteno

Tekianon sat mei tongeni pwe epwe napano mwach kan non FSM. (chepen 2 me esisin 6). Seni 2030, non eu sakkun anapanap, ena tekianon sat epwe nom nefinen 1.2-5.9 inis (3-15 cm). Ei tekianon sat fiti fengen me met epwe fis non ekkkan year, a tongeni forata wateno sat seni monumon me tanon unukun fonu. lei mo pwe mi chiwen wor met sipwe kaeo ngeni ach sipwe weweiti usun ekkewe choon ice seni non Antarctica me Greenland ren met repwe tongeni fori ngeni tekianon sat, ekkewe sou tipachem (scientists) ra esinesin nge mei tongeni pwe sat non ekkkan fansoun repwe tekiano.

Nenengaweno sat epwe napano

Anongonong won ekkewe unungat anapanap (kukunon, nefinan, me watteno) chonungawen ren ewe sat epwe napano non FSM tori nesoponon 21st century, anongonong won ewe kouk, an sat epwe tekiano. Wattenon chonungawenon sat epwe tongeni forata an epwe angawano manauen ekkewe me tanon ekkewe och. Nonon matau seni watten asepan me wattenon atawa ik, epwe tongeni puan forata osupwangeno ngeni ewe sat..



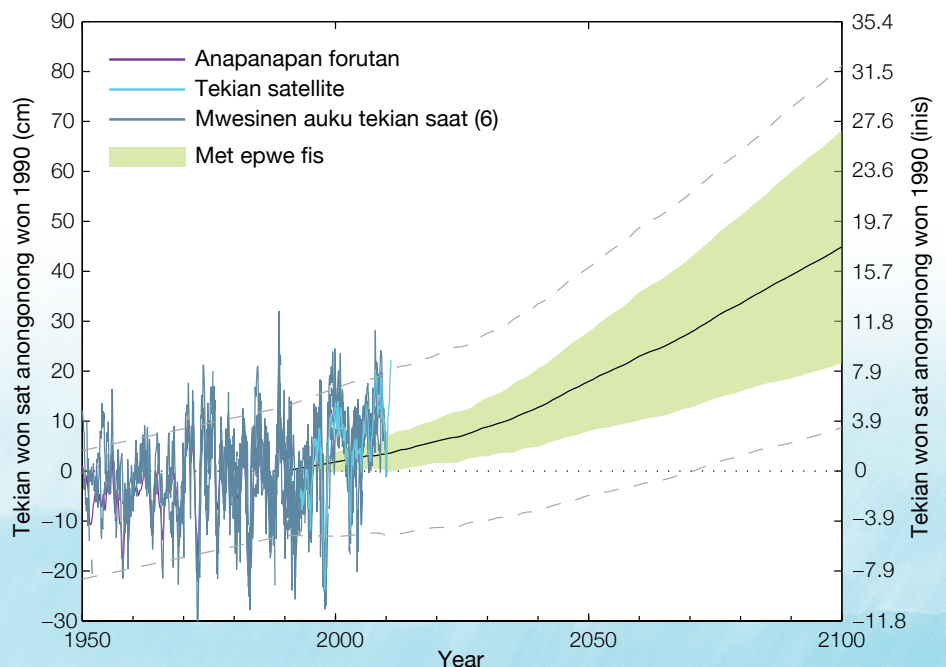
Johannes Berdon, National Weather Service Office

Tanon puna seni an sat a tonong non ewe fonu, Lekinioch, Chuuk.

Chepen 2: Sea-level rise projections for the Federated States of Micronesia for three emissions scenarios and three time periods. Values represent 90% of the range of the models and changes are relative to the average of the period 1980-1999.

	2030		2055		2090	
	(in)	(cm)	(in)	(cm)	(in)	(cm)
Kukunon pwichikar tou	1.2–5.5	3–14	3.5–10.2	9–26	6.3–18.1	16–46
Ukukuochun pwichikar tou	1.2–5.9	3–15	3.5–12.6	9–32	7.5–23.6	19–60
Wattenon pwichikar tou	1.2–5.9	3–15	3.9–11.8	10–30	8.3–24.4	21–62

Esisin 6: Koukun me napanapen mokutukutun sat unukun FSM. Koukun sat a eerier mi arauechoon (koukun sat seni ekkewe pisekin nengeni) a esisin mi arawfat (met satellite a auku seni ewe year 1993). Anapanapen mokutun sat unukun FSM seni ewe year 1950 mi enuen intiko. Ewe anapanap ren A1B (nefinan) ren pwichikar mi tou seni fonu (a ukukun 90% met a pwarata ren ekkewe anapanapen nengeni meinsin) eerier enuen fetin seni 1990 ngeni 2100. Ewe erino a kouk won 90% anongonong won met a fis seni year me year ren mokutun sat.



Ekesiwinin nonomun fonu me sat non FSM

- > Pwichikar a fen wattenno, o epwe napano o epwe fis pwe ekkoch ran mwach kan repwe fakkun pwichikareno.
- > Ukukun pungun ran seni 1952 a kukununo non Pohnpei, iwe nge non Yap ese wor ekesiwin. Napanapan nge pungun ran epwe wattenno mwach kan, mei tongeni fis pwe mwach kan pungun ran epwe fen wattenno nge epwe kukununo pwaasen fonu.
- > Nesopon ei century, napanapan nge epwe chokukuno asapwan mi pochokun (typhoons) o pochokuner repwe pual kukununo.
- > Tekian sat non FSM a napeno, iwe mei tongeni epwe wattenno non unusen ei century.
- > Ngawenon sat a fen wattenno non setin FSM. Iwe mei tongeni pwe epwe fen wattenno mwach kan o epwe tongeni forata ngaweno manauen non sat.

Masowen ei taropwe a fis seni tipeeun me angang fengen nefinen ekkewe ofesin Weather Service Offices non FSM fiti fengen me ewe Pacific Climate Change Science Program- eu kinikin an mun Australia aninis ren nenengeni tumunun fonu me aramas. Angangen ei taropwe a fis seni an ewe Pacific Climate Change Science Program anongonong won met ewe 2007 IPCC Aruanun Nenengeni Report. Ren auchean me tichikin porausen nonomun fonu me aramas non Federated States of Micronesia me ewe Pacific, ka tongeni pual kuna me non ewe *Climate Change non Pacific Scientific Assessment me New Research Ewin Kinikin 1: Regional Overview, Kinikin 2: ekkewe report seni eu me eu ekkewe fonu.*

www.pacificclimatechangescience.org

Ren om kopwe sineochu ekkei poraus, ka tongeni kokori ekkei napanan ofesin National Weather Service Office:

web: www.prh.noaa.gov/yap
phone: +691 350 2194

web: www.prh.noaa.gov/chuuk
phone: +691 330 2548

web: www.prh.noaa.gov/pohnpei
phone: +691 320 2248

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