

# Inanga

## Kimihia te urunga wai tai



He uaua te kimi i ngā wāhi toene inanga, engari ki te kitea e koe te **taha whakarunga o te taha wai tai** ka āwhina ki te whakawhāiti mai i tō rapu.

Ko te urunga wai tai te wāhi e tūtaki ai te wai tai o te moana ki te wai māori o te awa. He kiato ake/he taumaha ake te wai tai i te wai māori nā ngā ōpapa i roto, nō reira ka noho ki te kūkūpango, ā, ka rewa ake te wai māori ki runga ake. Ka noho mai ko tētahi wāhi mākahi te āhua o te wai tai i raro i te wai māori – e kīia ana tēnei he 'saltwater wedge'.

### He aha te totetote (salinity) o te wai?



Ka whakaatu tēnei i te papatipu o ngā tote kua memeha ki te wai – ka kīia ko ngā wāhanga i te mano (parts per thousand (ppt)) – he 35 ppt pea te totetote o te wai moana i Aotearoa.



Tata ki te 90% o ngā tote memeha he konutai pūhaumāota (tote tēpu), ko ētahi atu o ngā tote ka ahū mai i te hau māota, konutai, pūngāwhā, konupūmā me te konurehu.



He 0.5 ppt te totetote o te wai māori.

Hei kimi i te taha whakarunga o te urunga wai tai me whakamātau te totetote o te wai i raro o te awa (kūkūpango).

### Hei mahi i tēnei me whai koe:



**ine totetote** (he taura/pou mō te ine, he tikanga kohi rānei i te wai mai i ngā wai hōhonu ake)

Ka taea ngā ine totetote te tiki mai i NIWA Instrument Systems, Envco, ētahi atu kaiwhakarato taputapu ōrite rānei. Tērā rānei, me whakapā atu ki tō Kaunihera ā-Tāone, ā-Rohe rānei ka pātai atu mēnā ka āwhinahia koe.



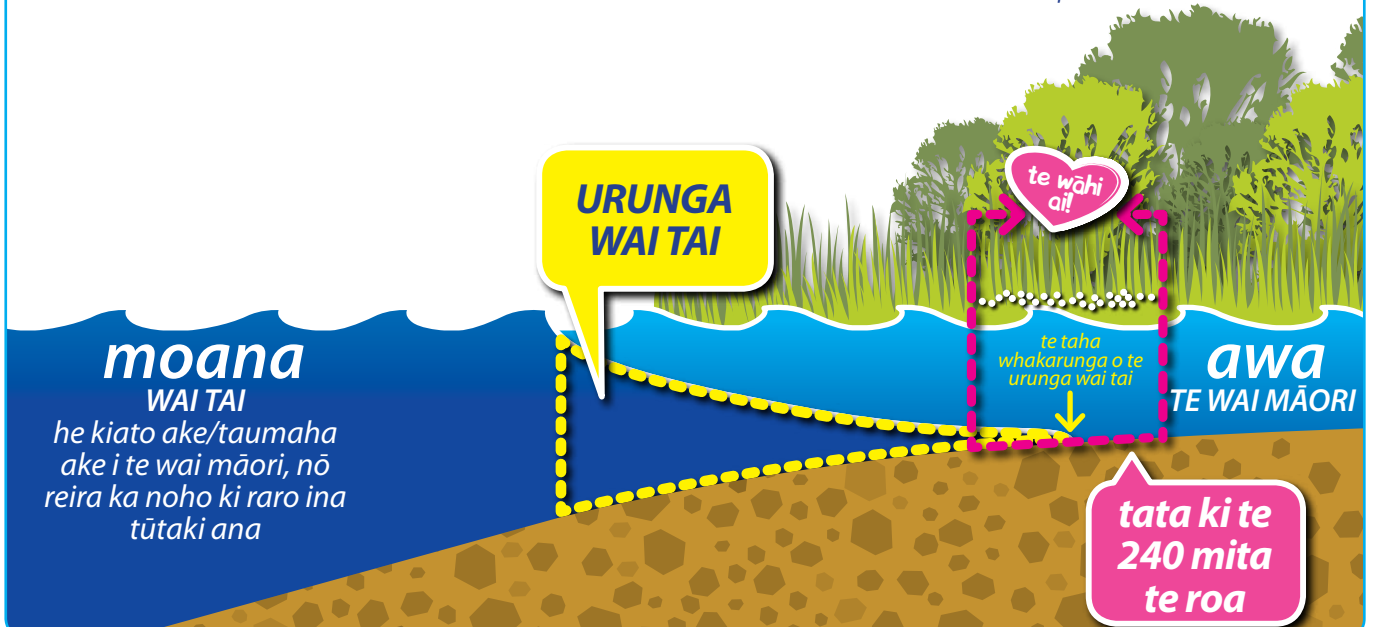
### pūrere GPS

**ngā utauta tuhipoka** (he pepa tuhi raraunga rānei, tirohia te whārangi whai ake mō tētahi tauria)



**waka** (he pai pea mō ngā awa hōhonu/whānui)

Me whakarite koe ka whai koe i ngā tikanga hauora me te haumaruru pai rawa ina whakamahi ana i ngā waka, hei tauria, te whakamahi i ngā kaiako waka rēhita, te whakarite kia rua kōrua i te iti rawa mō te tūpono tikoki.



## Tikanga mō te aromatawai i te totetote:

**Upane 1.** Kimi āhea te tai teka teitei whai ake mai i tō papatau tai ā-rohe. I konei ka aromatawai koe.

**Upane 2. RĀ 1**  
Haere ki te taha whakararo o te awa i mua noa atu i te wā i whakaritea mō te tai teka teitei.

**Upane 3.** Tukuna te haurapa ine totetote kia tau ki te papa o te wāhi hōhonu rawa o te awa, ka tatari kia taurite te pānui ka tuhi i te totetote/wā/tauwāhi GPS – me mātua tuhi ko te totetote 'ōraro'.

**Upane 4.** Hikina mai te haurapa ine totetote ki te mata o te wai i taua wāhi anō, ka tatari kia taurite te pānui ka tuhi i te totetote/wā/wāhi GPS – me mātua tuhi ko te totetote 'ōrunga'.

**Upane 5.** Me paku te neke whakarunga ka mahi anō i ngā upane 3 me te 4. Mēnā he ōrite ngā pānui ki tō wāhi tuatahi me huarua te tawhiti ki tō wāhi whai ake i runga ake ka mahi anō i ngā upane 3 me te 4.

**Upane 6.** Me mahi anō i te upane 5 kia heke haere ngā pānui toteote, kātahi ka whakaheke i te tawhiti i waenga i ngā wāhi.

**Upane 7.** Ina heke te totetote 'ōraro' i raro i te 0.5 ppt ka tohua te wāhi O MUA AKE i aromatawaihia i raro hei 'taha urunga whakarunga o te urunga wai tai' o tēnei rā.

**Upane 8. TE/NGĀ RĀ O MURI MAI**  
ME MAHI ANŌ ko ngā upane 1–7, engari me whakarite i tō taenga atu ki tō wāhi 'taha urunga whakarunga o te urunga wai tai' o nanahi ki te tai teitei.

## Ētahi atu awahina:



Me whakarite kei te tōkarikari te ine totetote - raua te haurapa ki te moana, ā, ko te tikanga ka tata ki te 35 ppt tana pānui, me rau ki tētahi karāhe wai, ko te tikanga ko tana pānui he iti ake i te 0.5 ppt.



Whakamahia ngā piriti hei tango pānui i waenga o te awa



Me mātua horoi te haurapa ki te kōrere wai i te mutunga o te rā.



Me tūpato i ngā hanganga i te awa (hei tauira, ngā kēti tai/ahuriri) e aukati ana i te rerenga whakarunga o te wai tai.



He wā roa ka tae atu te wai tai ki runga ake. Ka nekeneke whakarunga haere pea te urunga wai tai i muri rā anō i te wā i tohua ka teitei te tai i te wahapū o te awa, tauranga tūtata rānei.



Ko te tai e uru mai ana ki tētahi awa ka noho pēnei i te puni me te pei atu i te ia o te awa. Ka puritia pea te wai māori ki runga rawa atu mai i te taha o te urunga wai taha.



Ka pāngia te wāhi o te urunga wai tai e te nui o te tai i taua rā (tirohia te kōrero e whai ake) me te rere o te awa i taua rā - nō reira me whakatoharite koe i tana wāhi i roto i ngā rā maha.



Ka tohutohu ngā papatau i a koe mō te wā me te nui o te tai teitei mō taua rā, engari kei te āhua kē o ngā tohu huarere me te pēhanga hau te āhua ake o te tai teitei – ka taea e te pēhanga hau me ngā hau moana kia tino iti ake te tai ki tērā i matapaetia i ngā hōtaka tai.

### HEI PĀNUI ANŌ ME NGĀ RAUEMI ATU ANŌ:

- Find a moon phase calendar at [www.moonconnection.com](http://www.moonconnection.com)
- Find local tide tables at [www.linz.govt.nz/hydro](http://www.linz.govt.nz/hydro)

Kei te tautokona te Kaupapa Mātauranga Toene Inanga ā-Motu e...



AQUATIC SCIENCE & VISUAL COMMUNICATION



# Rangahau Tepe Wai Tai

RARAUNGAMETA	
Ingoa kōawa:	Ingoa riu awa:
Rā (RR/MM/TT):	Ingoa o ngā kaitirotiro:
Herenga kaupuke tūtata rawa:	Wā matapae o te tai pari (HH:MM):
Pēhanga kōhauhau o te rohe (hPa):	Wā o te tai pari i kitea (HH:MM):
He ārai anō i te rere o te tai (mēnā āe, homai ngā taipitopito) Tē mōhiotia / Kāo / Āe:	Āhua o te rere:  Pāpaku / Hāngai / Teitei / Tē Mōhiotia

RARAUNGA TIROTIRO		
I rapua e tēnei rangahau ngā taunakitanga mō te toene inanga:    Āe / Kāo		
He aha ngā mea i kitea?  Toene / Ngā Hua / Ngā Mea e Rua / Kore	He tuhinga toene anō mō tēnei wāhi?  Āe / Kāo / Tē Mōhiotia	Mō te taha ki te wāhi toene, ko te tepe wai tai  Kei Runga Ake / Kei Raro Ake / Kei Te Hāngai / Tē Mōhiotia

RARAUNGA TOTE WAI									
I tirotirohia te wāhi tepe wai tai:		Rāwhiti (NZTM):			Raki (NZTM):				
#	Wāhitū	Wā (HH:MM)	Rāwhiti (NZTM)	Raki (NZTM)	Hawai Maui Pono/ Waenga/Matau Pono	Hōhonu (m)	Tote wai (ppt)		
							Takere	Waenga o te wai	Mata o te wai
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

Ngā tuhinga tautoko
Ngā ingoakōnae whakaahua:

## Tātuhinga o te wāhi

Me uru ki te tātuhinga te whānui o te rangahau, ngā wāhi toene, ngā tauārai i te rerenga/ara, tepe wai tote, ngā momo māheuheu, whakamahinga whenua, ngā tūwāhi whakaahua, ngā taunga GPS

## NGĀ WHAKAMĀRAMA MĀ NGĀ KAITIROTIRO

### RARAUNGAMETA

**Ingoa kōawa:** ingoa o te kōawa i rangahautia

**Ingoa awa:** i roto i te Catchments of New Zealand (1956)

**Rā:** rā i tutuki te wāhanga mahi takiwā o te rangahau

**Ngā ingoa kaitirotiro:** hei whakamana i ngā otinga rangahau

**Tauranga Tūtata Whai Matapaenga Tai (Tuarua rānei):** tirohia [www.linz.govt.nz](http://www.linz.govt.nz) mō ngā rārangi o ngā tauranga Whai Matapaenga Tai, ngā mea pāhono Tuarua hoki

**Te wā matapae o ngā tai pari i te tauranga tūtata:** tirohia [www.linz.govt.nz](http://www.linz.govt.nz) mō ngā matapae i te tauranga tūtata rawa

**Ngā pēhanga kōhauhau tūtata o nāiane:** ka taea e te pēhanga hau kōhauhau te tino whakarerekē i te teitei o ngā tai o te rohe

**Te wā o te wai teitei i kitea i te wāhi rangahau:** te wā i kite koe e tino teitei ana te wai i te wāhi rangahau

**Ngā tauārai i te rerenga tai:** he karawata, kēti tai, pae kirikiri, aha atu, aha atu, ka taea te ārai i te rerenga tai?

**Ngā āhuatanga rerenga:** kei runga ake, kei raro iho rānei te kōawa i ngā āhuatanga rerenga noa?

### RARAUNGA TIROTIRO

**I rapua e tēnei rangahau ngā taunakitanga mō te toene inanga?**

I āta kimi koe i ngā hua, i kite rānei koe i te toene?

**He aha ngā mea i kitea?**

I kitea ngā hua, i kitea te toene, ngā mea e rua, kore rānei

**Kua tuhia ngā kōrero mō ngā mahi toene i tēnei wai i mua?**

He tuhinga kōrero anō mō ngā mahi toene i mua i tēnei kōawa?

### RARAUNGA TOTE WAI

**Tepe wai tote i tirotirohia i te wāhi:**

Mai i ngā raraunga i kohia, kei te tepe whakarunga o te wai tote?

**Mō ia wāhi e inea ai te wai tote, tāurua ngā raraunga e whai ake:**

Wā: te wā i inea

Rāwhiti: te ahopou o te wāhi ine mai i te GPS e whakamahi ana i te pūnaha taunga NZTM

Raki: te ahopae o te wāhi ine mai i te GPS e whakamahi ana i te pūnaha taunga NZTM

Hawai: tohua i te hawai te wāhi i tangohia ai te ine wai tote - mauī, waenga, matau rānei

Hōhonu: e hia te hōhonu o te wai i te wāhi i tangohia ai te ine tote wai?

Waitote: e hia te tote wai i raro, i waenga o te wai, i te mata o te wai anō hoki?