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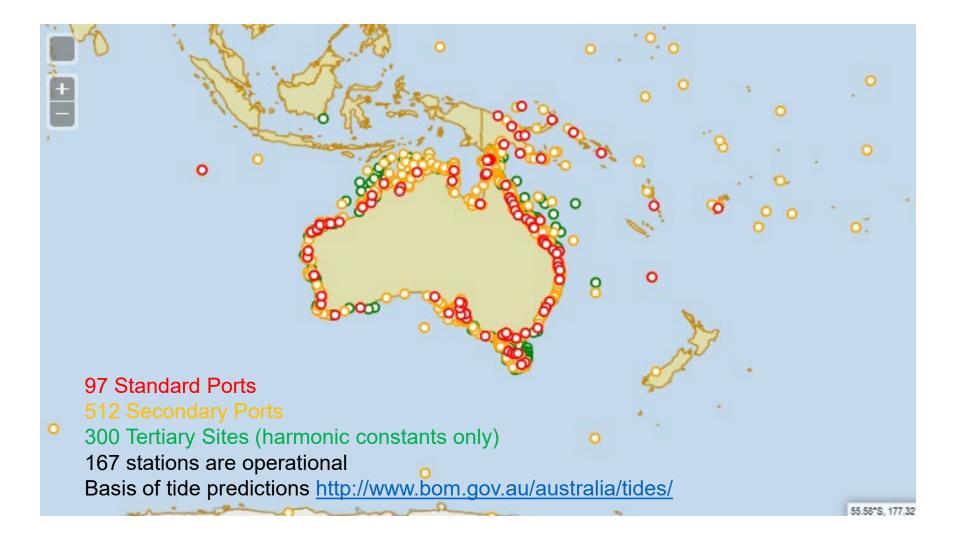
# Australia National Report GLOSS GE XVII

17th Session of the Group of Experts on the Global Sea Level Observing System (GLOSS) 7-11Nov2022

James Chittleborough, Technical Lead - Sea Level

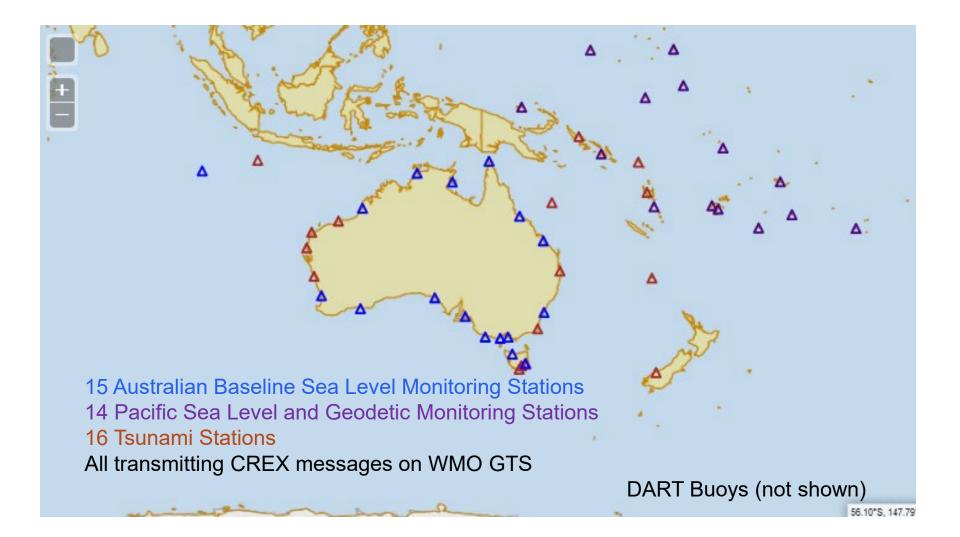
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## **Sea Level Data Holdings – Various Operators**



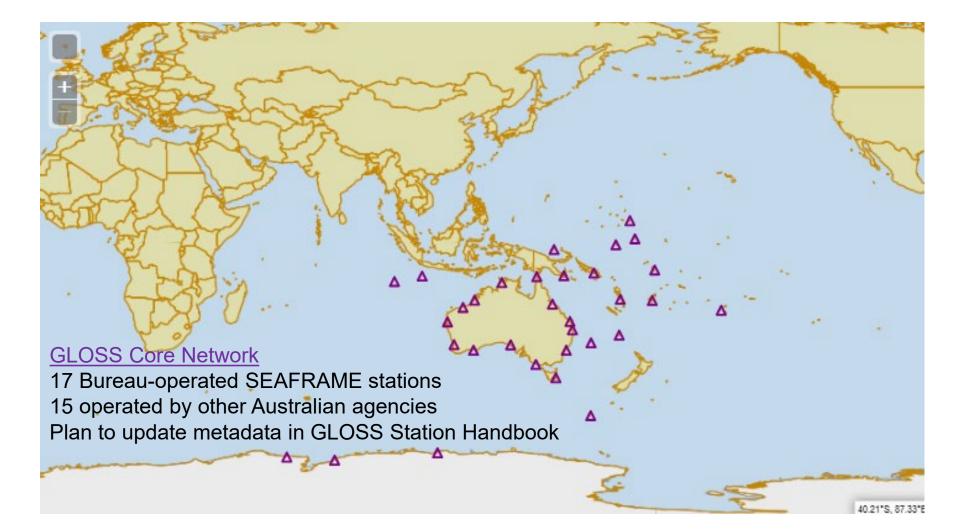


### **Sea Level Monitoring – Bureau Operated Stations**





## **Sea Level Data – GLOSS Contributions**





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# Sea Level Data

#### Contributions to GLOSS sea level data centers

- PSMSL (monthlies, updated once a year)
- UHSLC (hourlies, updated once a month)
- GESLA-3 (hourlies, courtesy of Ben Hague, Bureau of Meteorology)
- IOC Sea Level Monitoring Facility (1 minute, updated every 3 minutes)

### **Research Activities**

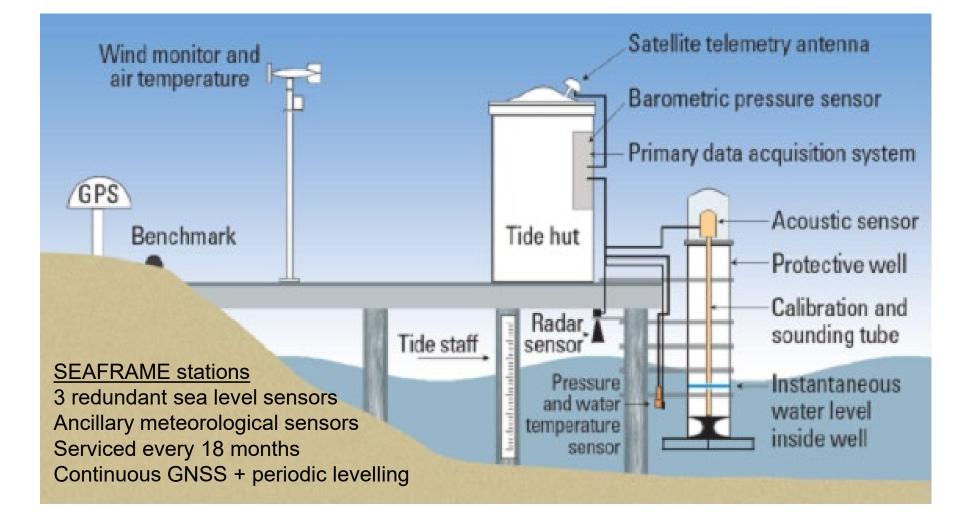
• ANCHORS: A multi-decadal tide gauge dataset to monitor Australian relative sea level changes (Hague et al 2021)

### Other

Numerous other operational activities, applications and research involving sea level data across the Bureau (tsunami, storm surge, flood, hydrology, coastal and ocean modelling, climate, sea level extremes, sea level rise, etc)



## **Sea Level Monitoring – Bureau Operated Stations**



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## **Future Plans**

#### Sea level data management

- Update station metadata
- Produce absolute sea level datasets (initiative under Pacific Sea Level and Geodetic Monitoring)
- Transition primary sea level sensor to radar
- Upgrade data management systems and customer access
- Investigate recommendations in IOC Manuals and Guides No. 83: Volume I – Automated QC
- Upgrade tidal analysis and prediction software



# **Tides and Sea Level Information Systems**

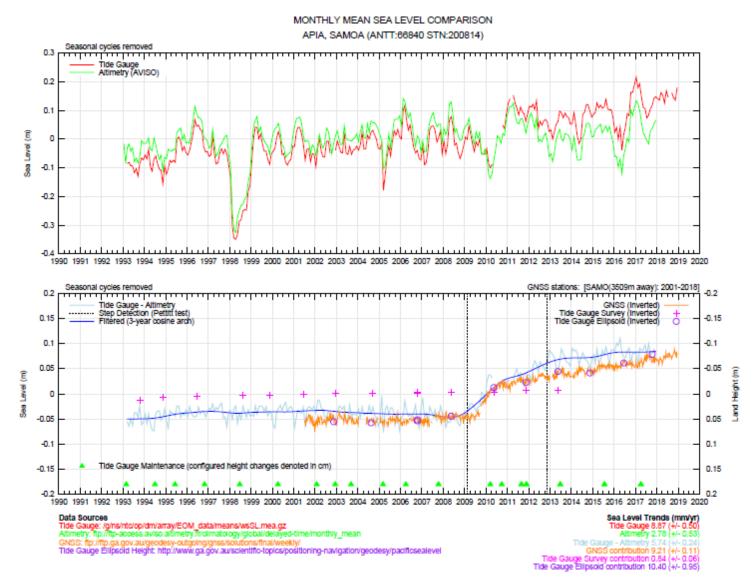
	9 67050 Suva				dal Information
Development	Station Information     Tide Predictions  Station Information for Suva	🔺 Extreme Tides 🛛 🗮 Tidal Levels 🔛 Sea Level	l Data 🔋 Model Guidance 🧧 Documents	C Graph Display	🛈 Map Display 🖨 🖪
Development	SITE	STATE	COUNTRY	ANTT	<b>e</b> •0
<ul> <li>Support products and services</li> </ul>	name Suva alt name Fiji ISLANDS, VITI LEVU - SUVA	name code	name Fiji code FJI	code 67050 alt ref 67050.0	
		STN	ID	alt code	
<ul> <li>Automation and efficiency</li> </ul>	AAC code INT_TP004	number 200863 array 200863	abbr sv alt abbr	type Primary networks PSLM GLOSS	
Customer focus			bank suva	oper flag Y gnss array SUVA	
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	tide gauge Bureau of Meteorology stn ref data supplier	codes IDO59001 hourty_csv IDO50000 monthly_stats tide_calendar rtdd	latitude -18.1342 longitude 178.4236 reference system	utc offset UTC+12:00 name Pacific/Fiji	
	data channel CMSS data licence		positional uncertainty		
	ANALYSIS	PREDICTION DATUM	TIDE GAUGE ZERO	HYDROGRAPHIC BENCHMARK	
🖗 67050 Suva	epoch start 1997-01-01T00:00:00Z	reduced level 0	reduced level 0	reduced level 3.206	ormation
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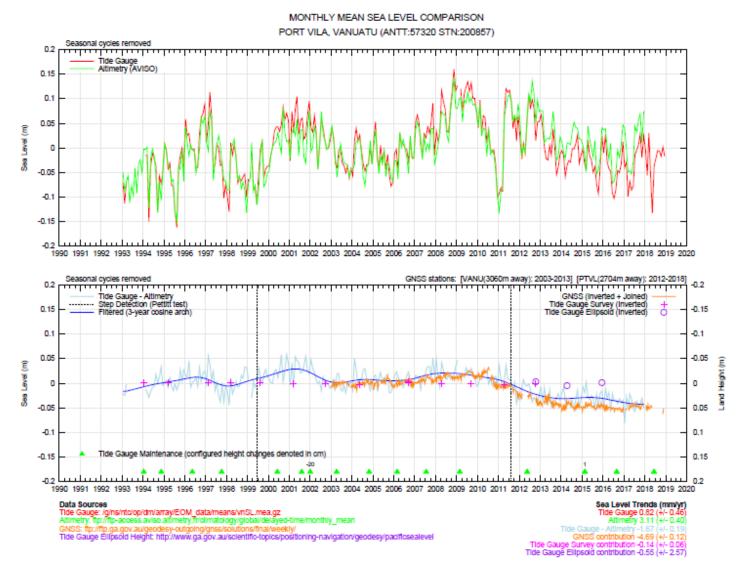
# **Sea Level Monitoring - Examples**



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# **Sea Level Monitoring - Examples**





# **Sea Level Monitoring - Examples**

MONTHLY MEAN SEA LEVEL COMPARISON HOME ISLAND, COCOS ISLANDS (ANTT:46280 STN:200865) Seasonal cycles removed 0.3 Tide Gauge Altimetry (AVISO) 0.2 0.1 Sea Level (m) 0 -0.1 -0.2 -0.3 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 GNSS stations: [COCO(10156m away): 2001-2018] Seasonal cycles removed 0.2 -0.2 \*\*\*\* ······ Tide Gauge - Altimetry GNSS (Inverted) ----- Step Detection (Pettitf test) Tide Gauge Survey (Inverted) 0.15 -0.15 Filtered (3-year cosine arch) 0.1 -0.1 0.05 -0.05 Ê Sea Level (m) Height 0 0 72 -0.05 0.05 -0.1 0.1 Tide Gauge Maintenance (configured height changes denoted in cm) -0.15 0.15 -0.2 0.2 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 Sea Level Trends (mm/yr) Data Sources Tide Gauge: /gins/ntclop/dm/array/EOM\_data/means/coSL.mea.gz Attimetry: ftp://ftp-access.aviso.attimetry.friclimatology/global/delayed-time/monthly\_mean GNSS: ftp://ftp-ga.gov.au/geodesy-outgoing/gnss/solutions/final/weekly/ Tide Gauge 7.24 (+/- 0.56 Altimetry 3.28 (+/- 0.60 Tide Gauge - Altimetry 4.03 GNSS contribution 1.14 (+/- 0.04)

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Tide Gauge Survey contribution 4.41 (+/- 0.40

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# Thank you

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