Funafuti, Tuvalu OR19-3 Site – Atmospheric Corrosivity

Site OR19-3

Funafuti, Tuvalu Site (Image by Geosun).

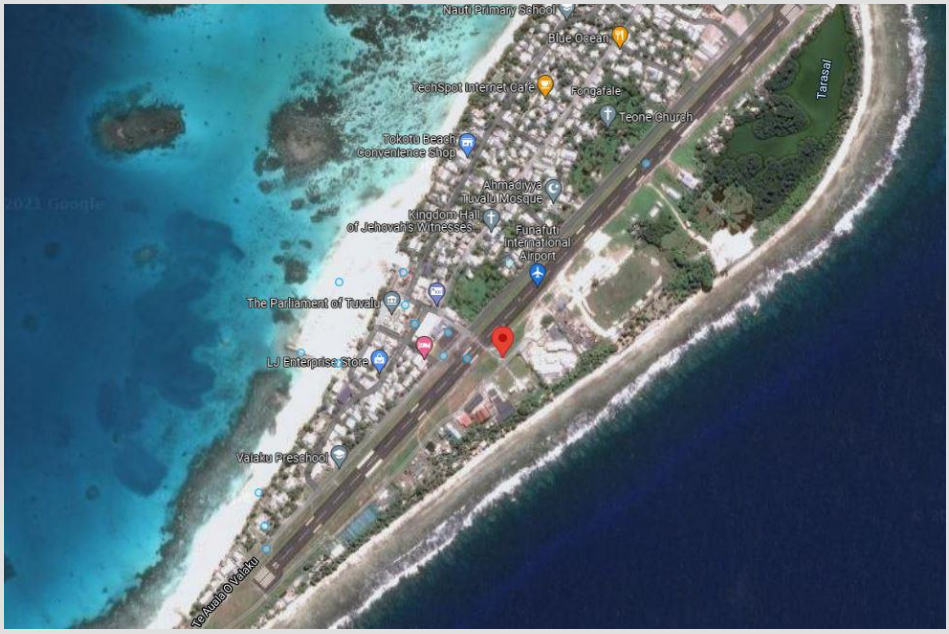
Background:

The site is positioned approximately 210 m west of the shores of the west-central Pacific Ocean, at an elevation of 3 m above sea level [1] on the island of Fongafale [1], the largest narrow land islet of the atoll Funafuti [2] [3]. It is also located near Funafuti International Airport [1]. To the site's left (~250-260 m away) lies Te Namo Lagoon, with a surface area of approximately 275 km^2 [3]. The population of Funafuti is given near 6 300 people [3], with its economy mainly depending on services, tourism, subsistence farming and fishing [4].

The site is classified per the Köppen-Geiger system as a hot tropical environment (Köppen Af), with high humidity year-round and a mean temperature of 28.6 ± 0.9 ºC, varying between 23.7ºC and 30.6ºC. The average annual precipitation at the site is near 3 100 mm, and the mean annual humidity level, 75.1 ± 18.8%. Apart from salt deposition from the nearby ocean and lagoon, other airborne pollutants likely originate from the neighbouring airport and several human settlements. The average wind speed at the site is 7.9 ± 2.4 m/s, with gusts of 19.0 m/s, in a predominant southerly direction [5].

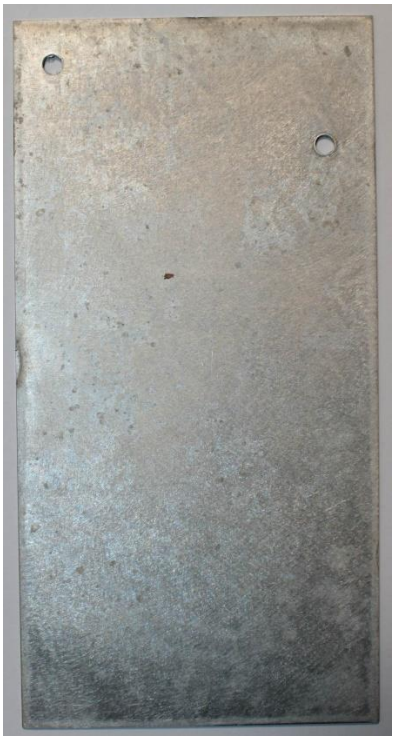
Per the atmospheric corrosion data below, this tropical marine site is classified as Moderately to Highly corrosive with significant deposition of chlorides (ISO 9223) [6].

Position of the Funafuti, Tuvalu Site [1].



Satellite view of the Funafuti, Tuvalu Site [7].

Funafuti, Tuvalu OR19-3 Site – Atmospheric Corrosivity					
GPS Coordinates of Site:	8°31'30.3"S 179°11'46.8"E	**Elevation above Sea Level (m):**	~3 m	**Distance from Ocean:**	~210 m
ISO 9226 Corrosion Rates and ISO 9223 Corrosivity Classification					
12-month R_{CORR} Mild steel (µm/yr)			39.9 ± 3.0 µm/yr		
12-month R_{CORR} Aluminium (µm/yr)			<0.1 µm/yr (Negligible)		
12-month R_{CORR} Hot Dip Galvanised Steel (µm/yr)			3.0 ± 0.4 µm/yr		
12-month R_{CORR} Copper (µm/yr)			1.9 ± 0.2 µm/yr		
ISO 9223 Corrosivity Classification			Medium-High (C3-C4)		
Typical surface contaminants			Low-Medium salt mix deposition Specific contaminants include: Water-soluble salts – 6-14 mg/m^2 Nitrites – 0.5 ppm Chlorides – 12 ppm pH – Slightly alkaline		

 **Mild steel – 12 months**	 **Mild steel – 12 months**
 **Aluminium – 12 months**	 **Aluminium – 12 months**

 **HDG – 12 months**	 **HDG – 12 months**
 **Copper – 12 months**	 **Copper – 12 months**

Works Cited

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