UNEP CISPAC5 & ROK-PI CLIPS3 JOINT REGIONAL TRAINING ON PICASO AND ANTICIPATORY ACTION
20-22 Apr. 2026, Nadi, Fiji

APCC
APEC CLIMATE CENTER

Consensus Climate Outlook

- Introduction
- Hands-On

Jong-Hwa Lee
Seoul National University

Many Good Forecasts in the World, but…One Forecast must be issued

CoCO prediction, CoCO function

CoCO prediction was made on the basis of the existing PICASO prediction.
CoCO function is implemented on the foundation of existing PICASO software.

PICASO
Climate Outlook

CoCO
Overview

CoCO
Algorithm

CoCO
Hands-On

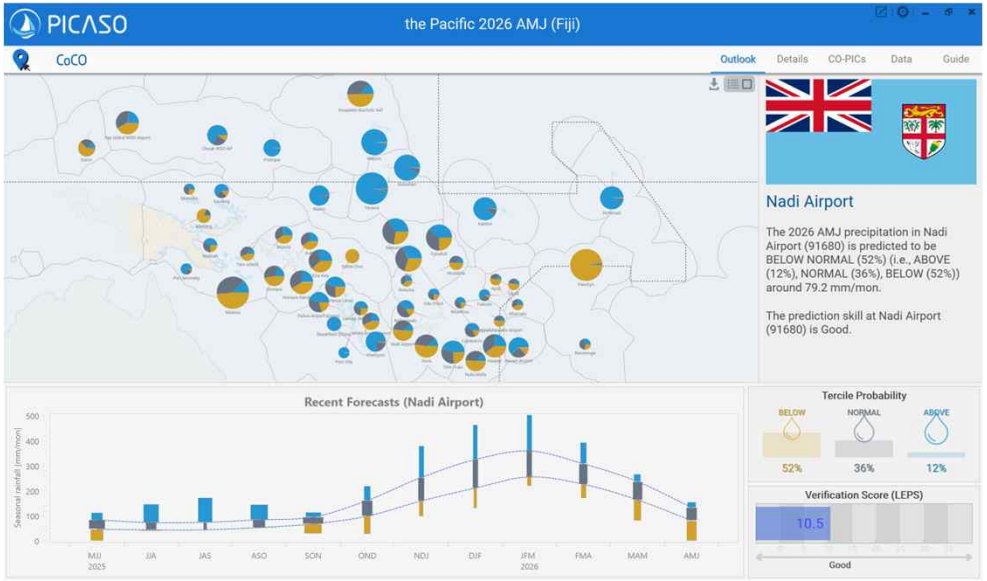
ROK-PI1

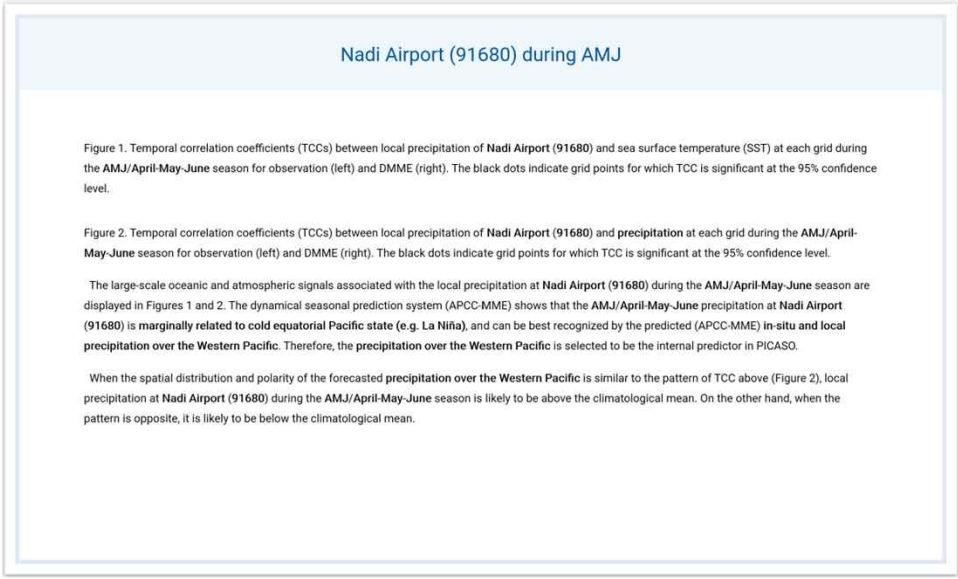
PICASO

: National Tailored Seasonal Climate Outlook using APCC official seasonal climate prediction
(=Nation-wide Downscaling)

* Official Seasonal Prediction : APCC dynamical seasonal prediction with multi-model ensemble

Predictand	Type	Interval	Target
Seasonal (3mon) Precipitation [mm/mon]	Tercile Probability BN, NN, AN	1 month	53 stations of 14 Pacific Island Countries





Nadi Airport (91680) during AMJ

Figure 1. Temporal correlation coefficients (TCCs) between local precipitation of **Nadi Airport (91680)** and sea surface temperature (SST) at each grid during the **AMJ/April-May-June** season for observation (left) and DMME (right). The black dots indicate grid points for which TCC is significant at the 95% confidence level.

Figure 2. Temporal correlation coefficients (TCCs) between local precipitation of **Nadi Airport (91680)** and **precipitation** at each grid during the **AMJ/April-May-June** season for observation (left) and DMME (right). The black dots indicate grid points for which TCC is significant at the 95% confidence level.

The large-scale oceanic and atmospheric signals associated with the local precipitation at **Nadi Airport (91680)** during the **AMJ/April-May-June** season are displayed in Figures 1 and 2. The dynamical seasonal prediction system (APCC-MME) shows that the **AMJ/April-May-June** precipitation at **Nadi Airport (91680)** is **marginally related to cold equatorial Pacific state (e.g. La Niña)**, and can be best recognized by the predicted (APCC-MME) **in-situ and local precipitation over the Western Pacific**. Therefore, the **precipitation over the Western Pacific** is selected to be the internal predictor in PICASO.

When the spatial distribution and polarity of the forecasted **precipitation over the Western Pacific** is similar to the pattern of TCC above (Figure 2), local precipitation at **Nadi Airport (91680)** during the **AMJ/April-May-June** season is likely to be above the climatological mean. On the other hand, when the pattern is opposite, it is likely to be below the climatological mean.

The various climate centers around the world produce and share predictions competitively and try to provide customized predictions for requesting regions.

That's why you'll find more and more seasonal probability predictions that you can access from many climate centers.

We wanted to make it easy for met officers like you to mix different predictions

Single Model Ensemble Prediction

$$y = f(x) + \varepsilon_m + \varepsilon_r + \varepsilon_{in}$$

Future rainfall; Predictable part; Model error (Bias); random error (noise); internal variability

Multi Model Ensemble (MME) Prediction

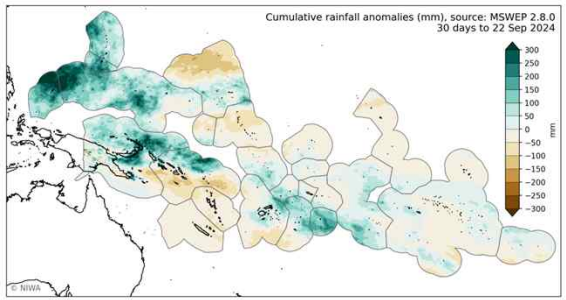
$$y = f(x) + \varepsilon_m + \varepsilon_r + \varepsilon_{in}$$

Future rainfall; Predictable part; Model error (Bias); random error (noise); internal variability

Multi-model ensemble approach minimizes the uncertainty of the model prediction by reducing systematic bias and random noise

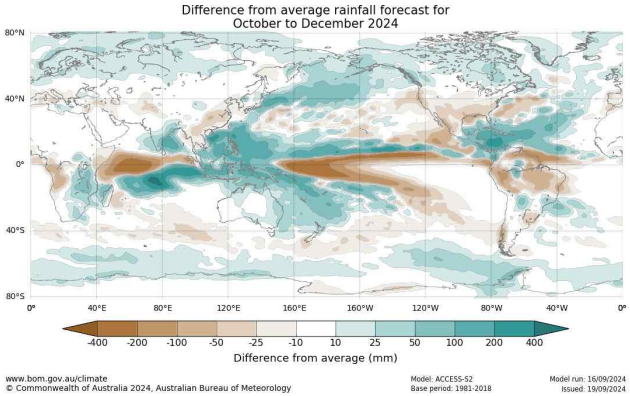
Seasonal Climate Prediction

ICU New Zealand

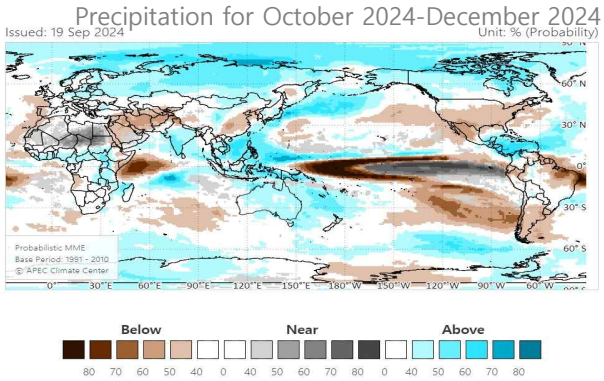


METEO FRANCE · cmcc · Met Office · Canadä · DWD · 気象庁 · ECMWF

ACCESS-S Australia



APCC Korea



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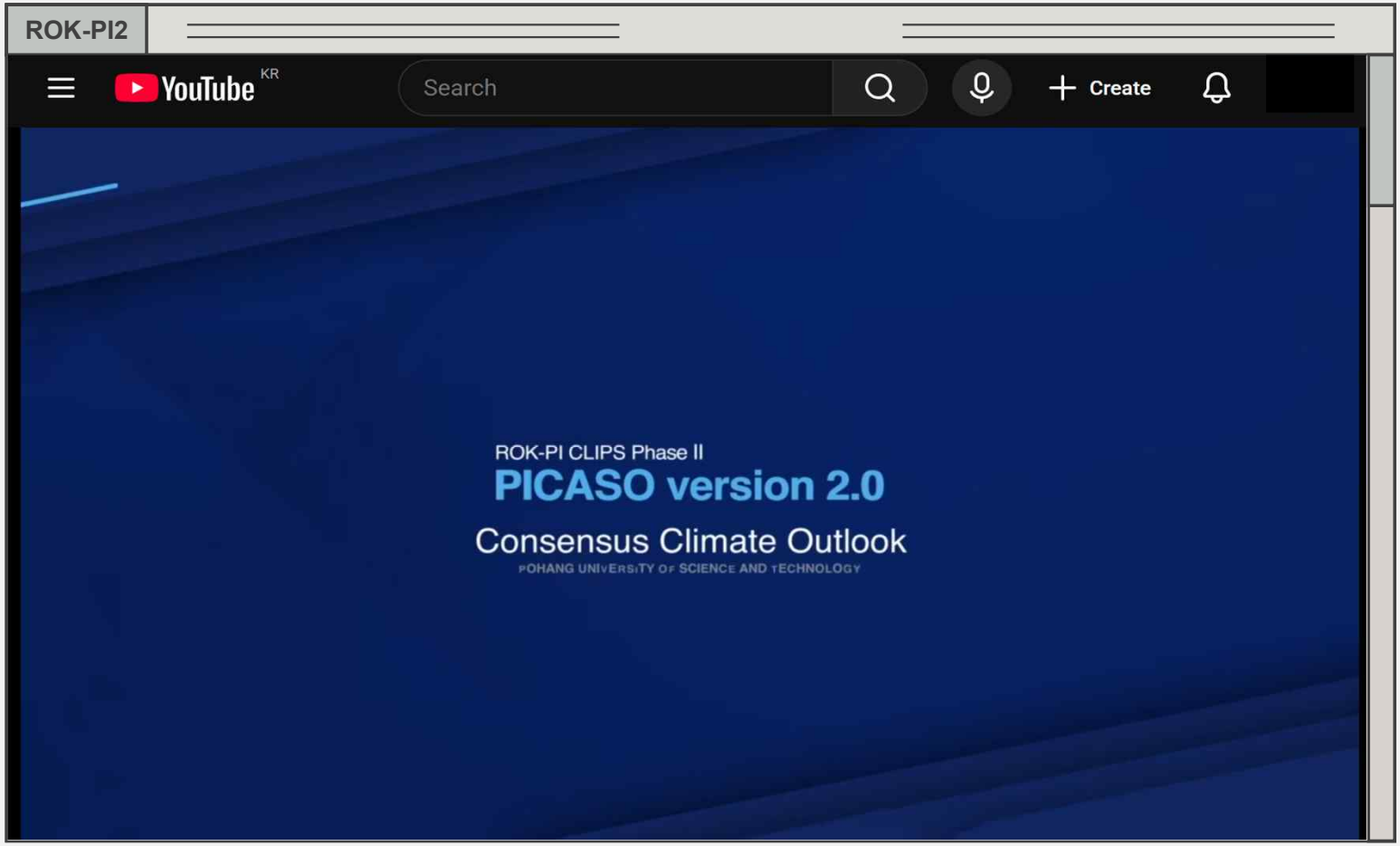
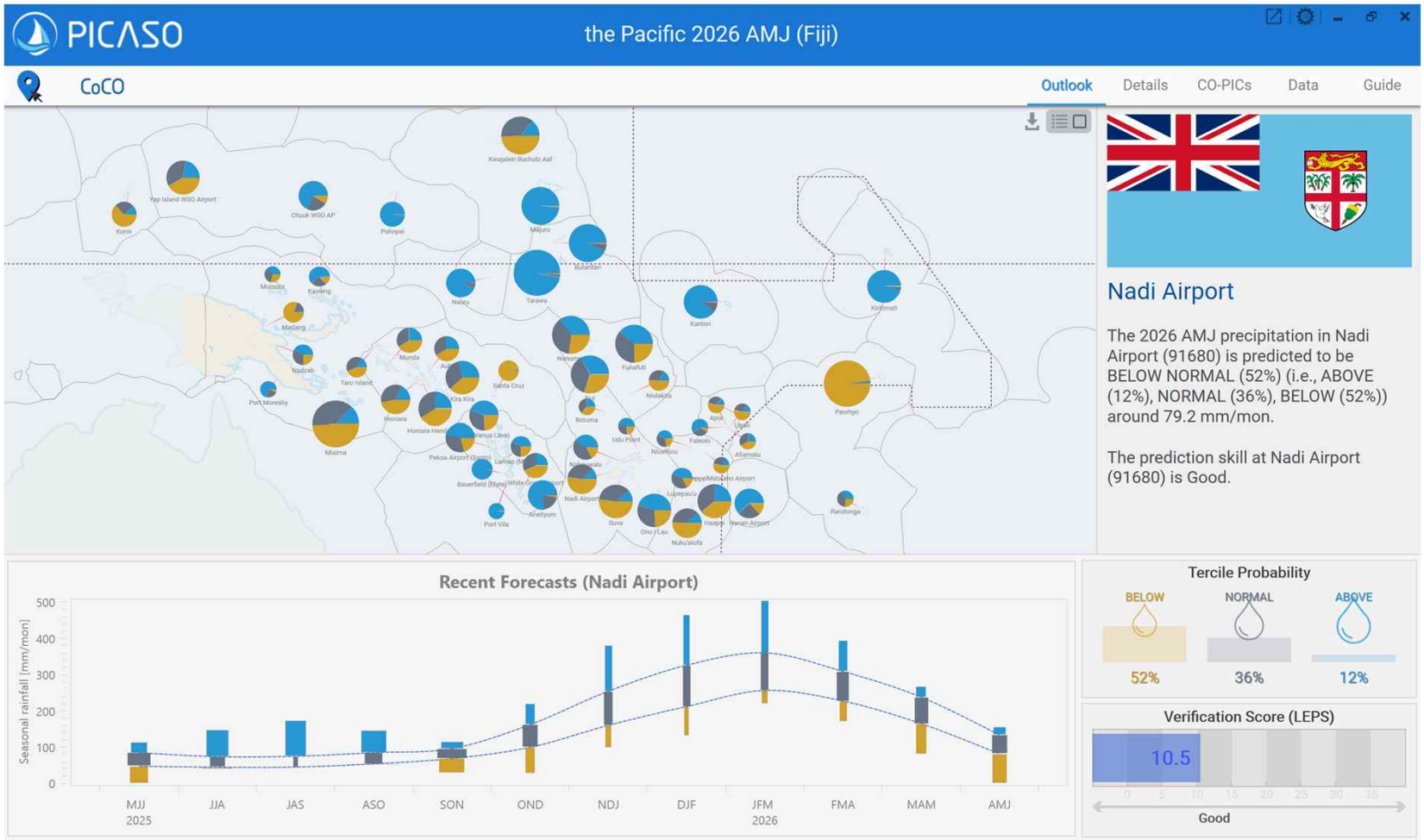


https://youtu.be/ekrLXtI9Jcw?si=iHzC0CXFynfjLqqf


PICASO
the Pacific 2026 AMJ (Fiji)
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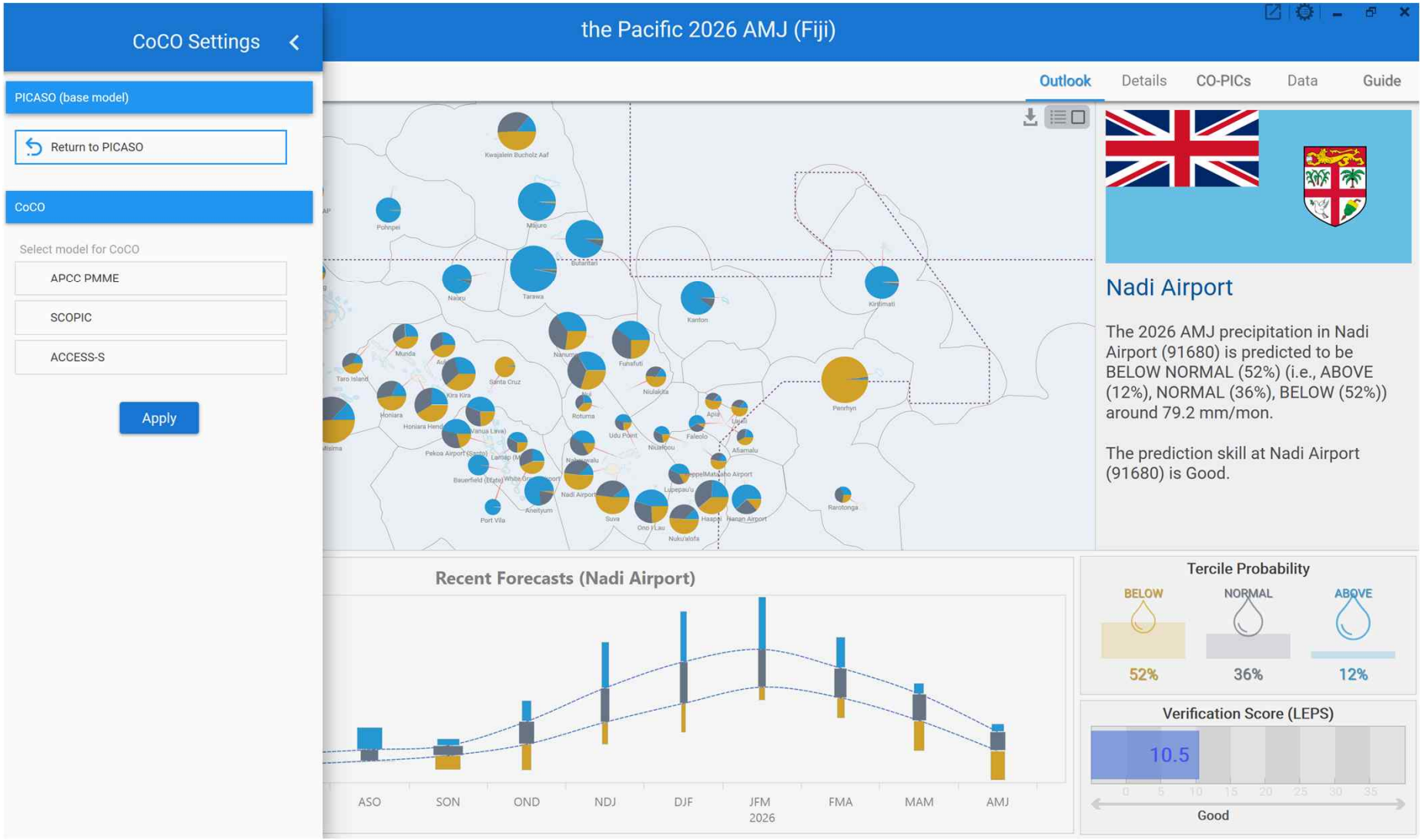
Nadi Airport
The 2026 AMJ precipitation in Nadi Airport (91680) is predicted to be BELOW NORMAL (52%) (i.e., ABOVE (12%), NORMAL (36%), BELOW (52%)) around 79.2 mm/mon.
The prediction skill at Nadi Airport (91680) is Good.
Recent Forecasts (Nadi Airport)
Seasonal rainfall (mm/mon)
500
400
300
200
100
0
MJJ
2025
JJA
JAS
ASO
SON
OND
NDJ
DJF
JFM
2026
FMA
MAM
AMJ
Tercile Probability
BELOW
NORMAL
ABOVE
52%
36%
12%
Verification Score (LEPS)
10.5
0
5
10
15
20
25
30
35
Good


CoCO Settings
PICASO (base model)
Return to PICASO
CoCO
Select model for CoCO
APCC PMME
SCOPIC
ACCESS-S
Apply
the Pacific 2026 AMJ (Fiji)
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SON
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2026
FMA
MAM
AMJ
Tercile Probability
BELOW
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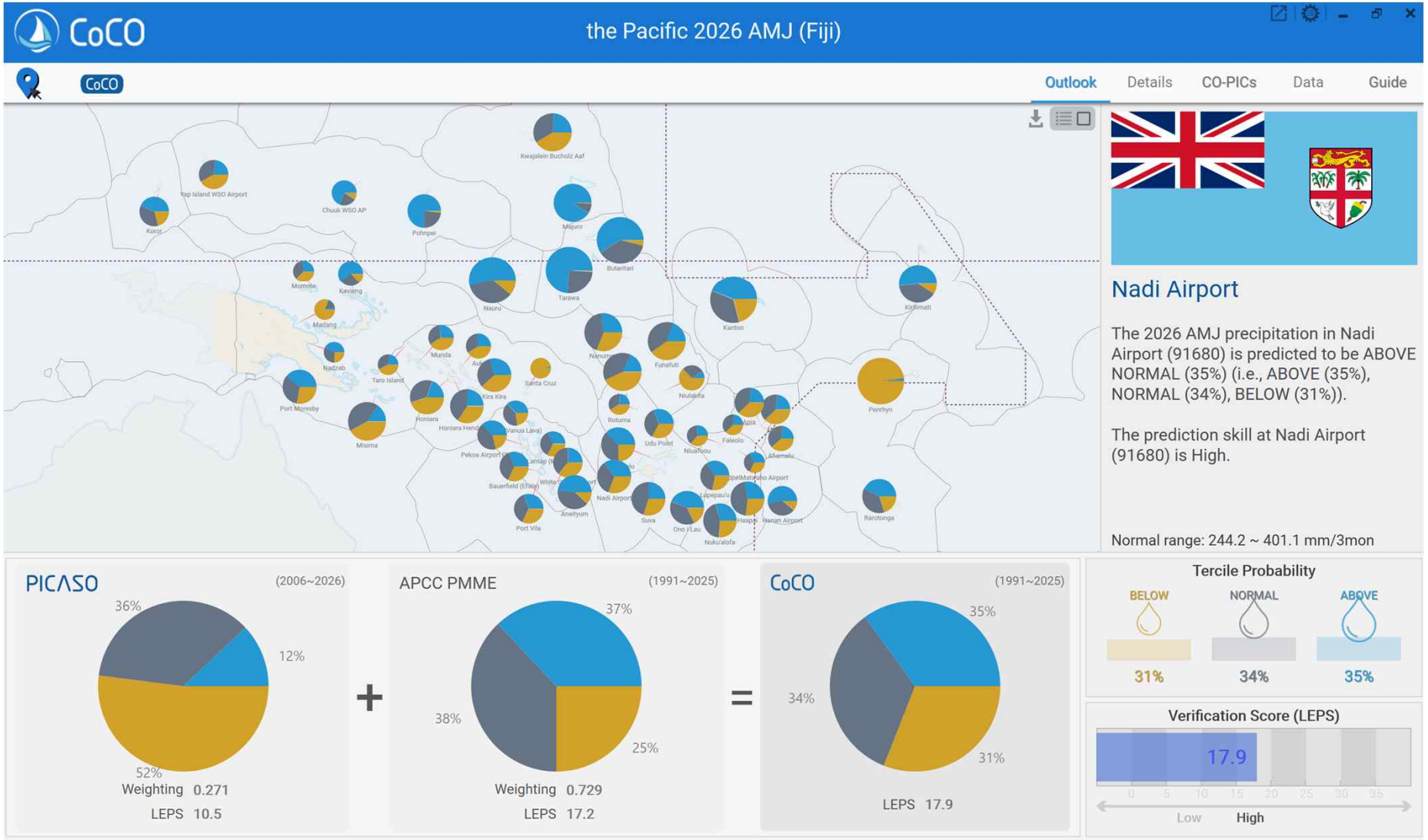
ABOVE
52%
36%
12%
Verification Score (LEPS)
10.5
Good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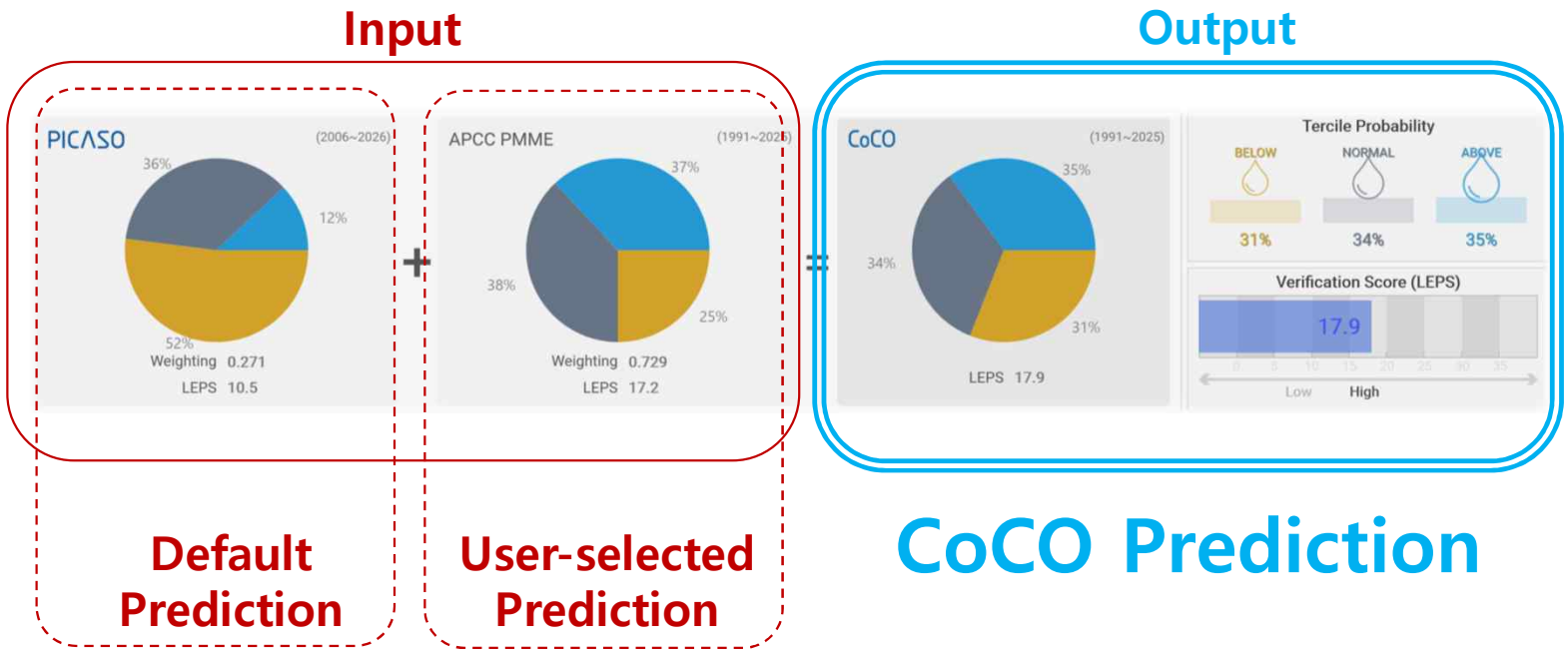
The prediction skill at Nadi Airport (91680) is High.
Normal range: 244.2 ~ 401.1 mm/3mon
PICASO
(2006~2026)
36%
12%
52%
Weighting 0.271
LEPS 10.5
+
APCC PMME
(1991~2025)
37%
38%
25%
Weighting 0.729
LEPS 17.2
=
CoCO
(1991~2025)
35%
34%
31%
LEPS 17.9
Tercile Probability
BELOW
NORMAL
ABOVE
31%
34%
35%
Verification Score (LEPS)
17.9
0 5 10 15 20 25 30 35
Low
High



Under the pie chart of each prediction are LEPS skill score and weight (%).

In the upper right of each pie chart is the data period of LEPS. These bar gauge are shown LEPS of the CoCO prediction.

LEPS skill score is a representative value of the verification score used in most Pacific Island Countries.

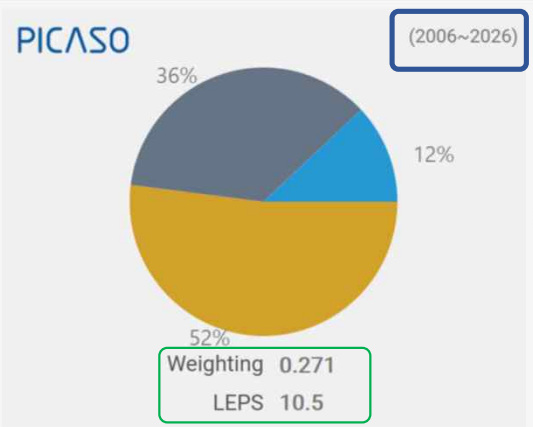
verification should be performed from the year after the end of the training period to 1 year before the year selected by the user

In most cases, we only obtain the forecast values for the current season. the training period is usually unknown.

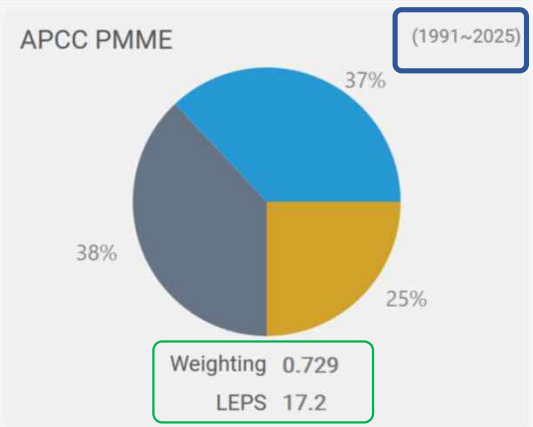
LEPS calculation constraint. : because setting an absolute standard for the data period is difficult

- PICASO predictions and its LEPS must be the same before and after the CoCO function is applied.
- the user-selected prediction uses the entire period of input data due to lack of data.
- As a result, the CoCO uses the common period of the two data periods.

Default Prediction



User-selected Prediction



● Weighting

$$C_{ij} = w_x X_i + w_y Y_j$$

$$w_x = \frac{LEPS_x{}^2}{LEPS_x{}^2 + LEPS_y{}^2}, w_y = \frac{LEPS_y{}^2}{LEPS_x{}^2 + LEPS_y{}^2}$$

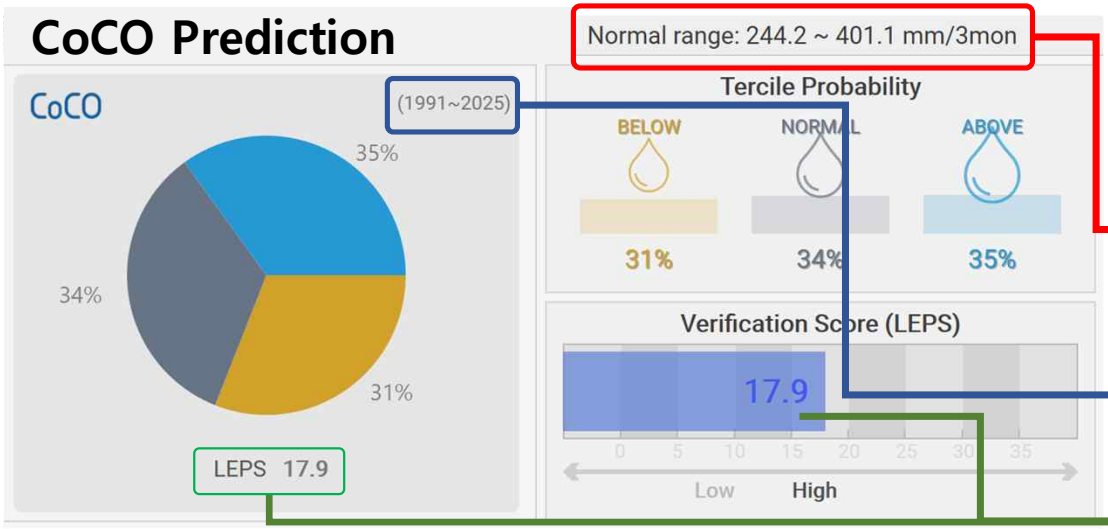
To avoid misunderstanding, the LEPS period is set to be displayed on the screen.

CoCO prediction only give you a probability information.

Since there is no model climatology for CoCO prediction, the probability value cannot be converted into physical quantity.

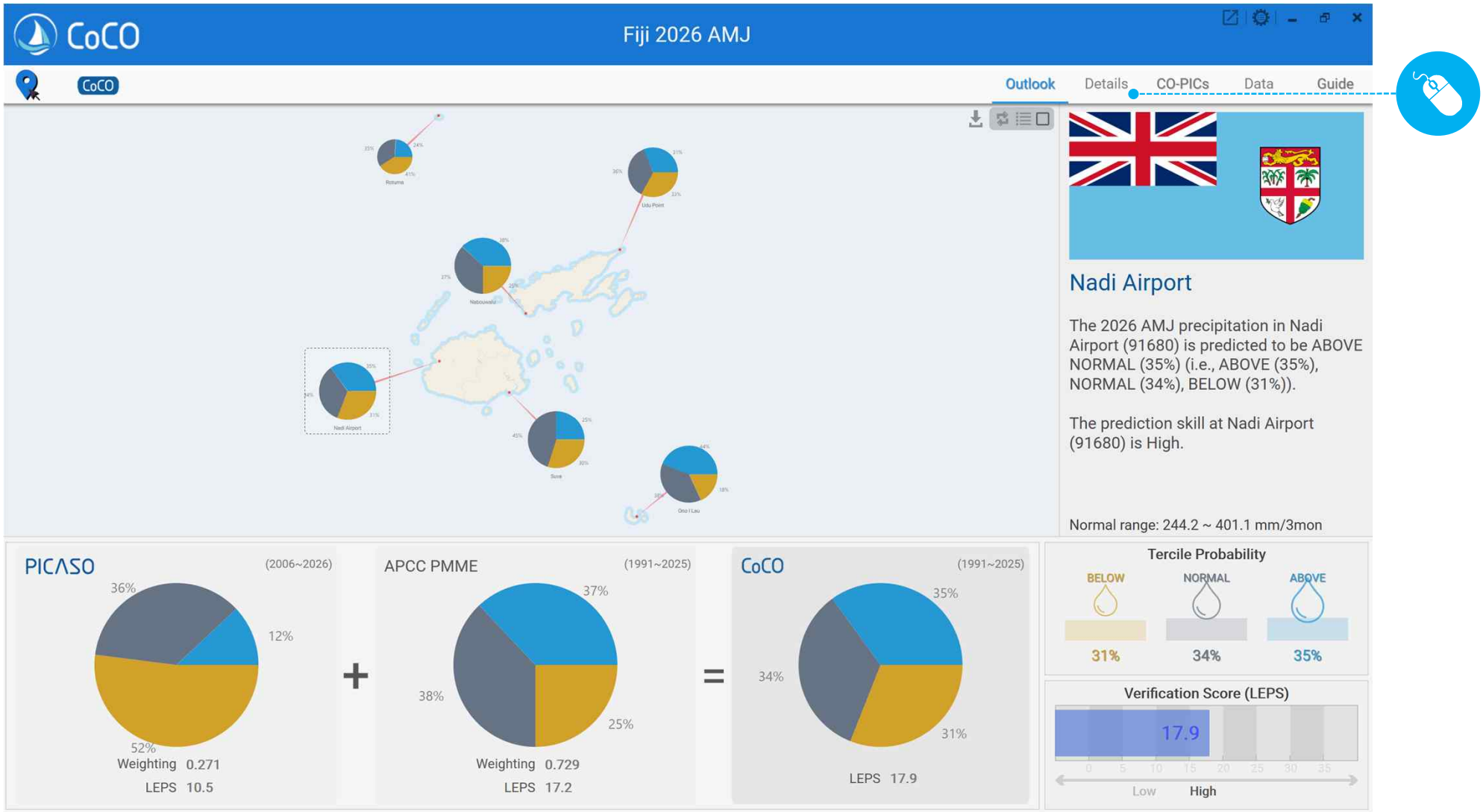
So we decided to provide a normal range of the OBS data for the training period of PICASO prediction

Careful!, The values of the Normal range does not refer to the CoCO prediction's normal range. It is just for your information



- **Range of Near Normal**
  - 33% ≤ Near Normal (NN) ≤ 67%
- **The period used for LEPS calculations of**
  - CoCO is the common period of the two input predictions.
- **LEPS score**
  - Number and a bar gauge format

Please use Normal range only as a rough estimate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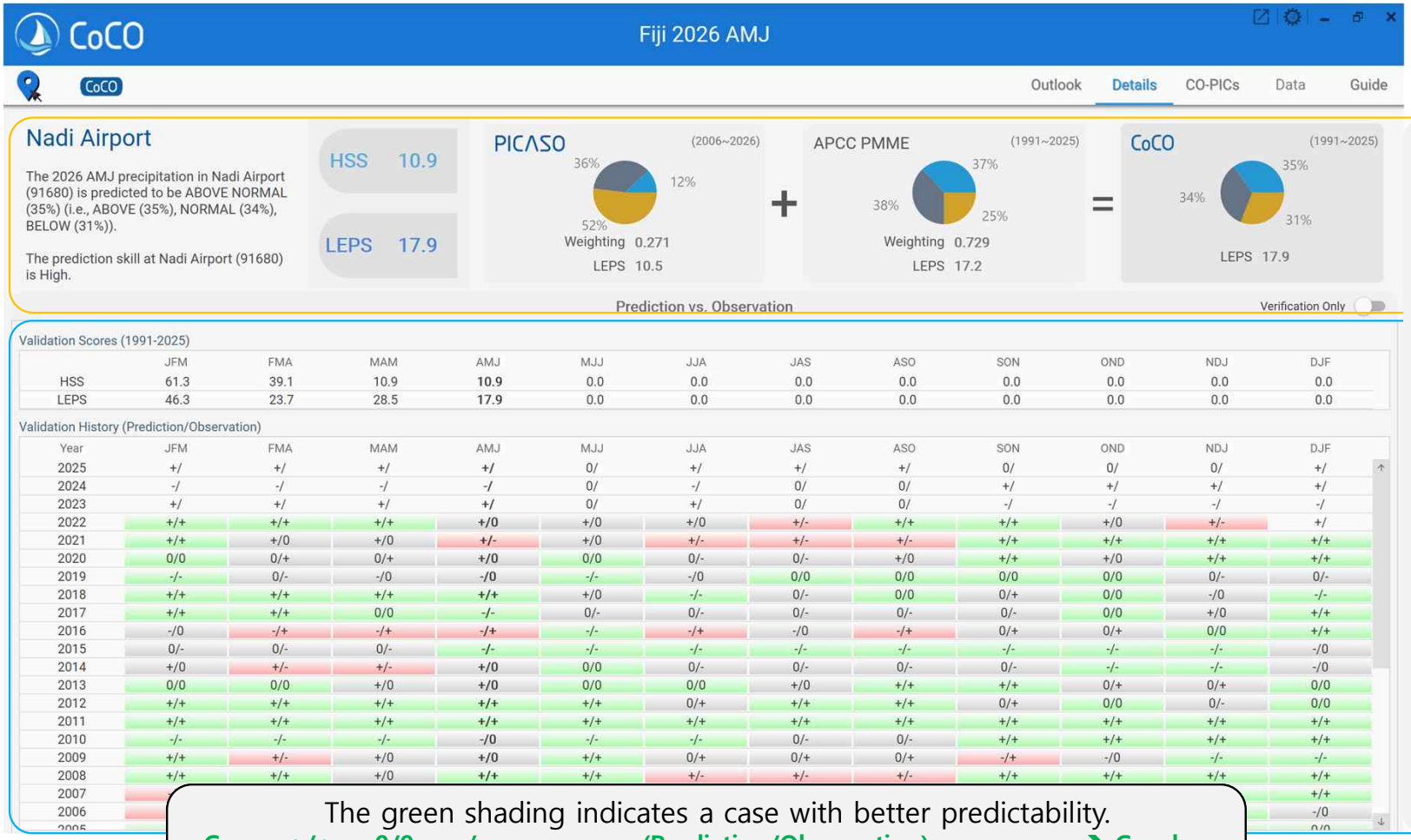


The green shading indicates a case with better predictability.

Green: +/+ or 0/0 or -/-	(Prediction/Observation)	➔ Good
Gray : +/0, -/0 , 0/+, 0/-	(Prediction/Observation)	➔ Wrong
Red : +/- or -/+	(Prediction/Observation)	➔ Bad

To validate the CoCO prediction (2026 AMJ season)

You need 2 things

1. CoCO prediction data
 : AMJ 2026 tercile probability

2. Observation
 : more than 10 years AMJ OBS before 2026.

If you have less than 10 years of OBS ➔ LEPS cannot be provided

If you have no prediction data ➔ the existing prediction would be the CoCO prediction

The basic form is the same as the PICASO mode. but training period and validation period were not divided for maximum use of data.

The Case of Prediction Data is missing

The period used for LEPS

Use all available data before the target year (selected year) to validate.

In this case
Selected year : 2023 MAM
Validation period : 2010 to 2022

	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ	DJF
HSS	55.9	29.4	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LEPS	41.8	15.3	23.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Year	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ	DJF
2022	+/+	+/+	+/+									
2021	+/+	+/0	+/0	+/-	+/0	+/-	0/-	0/-	+/+	+/+	+/+	+/+
2020	0/0	0/+	0/+	+/0	0/0	-/-	-/-	0/0	+/+	+/0	+/+	+/+
2019	-/-	-/-	-/0	-/0	-/-	-/0	-/0	0/0	-/0	0/0	-/-	+/-
2018	+/+	+/+	+/+	+/+	+/0	+/-	+/-	+/0	-/+	0/0	-/0	-/-
2017	+/+	+/+	0/0	0/-	0/-	-/-	0/-	0/-	+/-	0/0	+/0	+/+
2016	-/0	-/+	-/+	-/+	-/-	-/+	-/0	-/+	+/+	0/+	+/0	+/+
2015	0/-	0/-	0/-	0/-	-/-	-/-	-/-	0/-	-/-	-/-	-/-	-/0
2014	0/0	0/-	0/-	+/0	0/0	-/-	+/-	0/-	-/-	0/-	-/-	-/0
2013	0/0	0/0	+/0	+/0	0/0	+/0	+/0	0/+	+/+	0/+	0/+	0/0
2012	+/+	+/+	+/+	+/+	+/+	+/+	+/+	+/+	-/+	0/0	0/-	-/0
2011	+/+	+/+	+/+	+/+	+/+	+/+	+/+	+/+	+/+	+/+	+/+	+/+
2010	-/-	-/-	-/-	-/0	-/-	-/-	-/-	0/-	+/+	+/+	+/+	+/+

For example, there is no SCOPIC prediction to combine.
So the PICASO prediction becomes the CoCO prediction.

Even if the system can provide the LEPS score, it's because there is enough OBS data.
It used all available data before the target year (selected year) to validate.

However, SCOPIC prediction doesn't exist, means nothing to combine so the weight is set to 0.

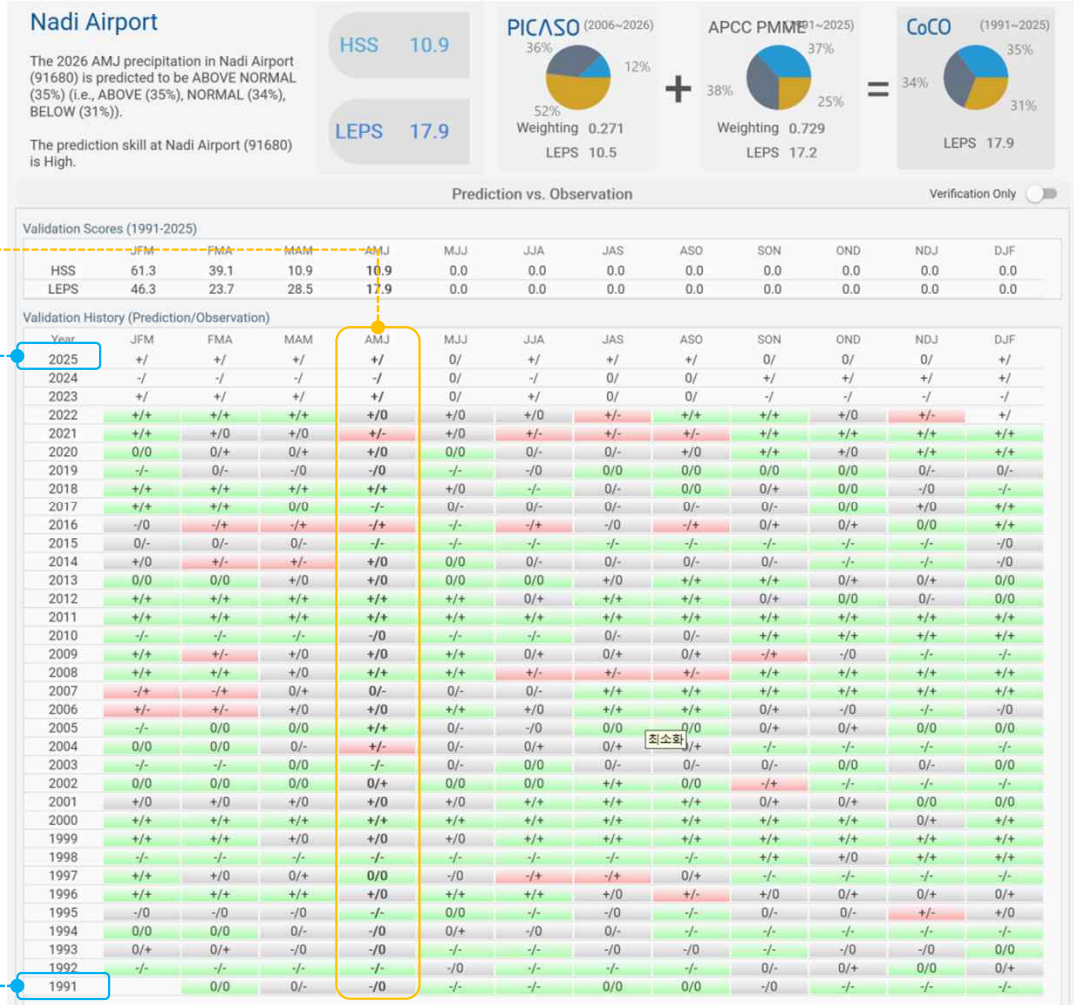
The Case of
All data is prepared

The period used for LEPS

The period used in the LEPS calculation of CoCO prediction is the common period of the two input prediction.

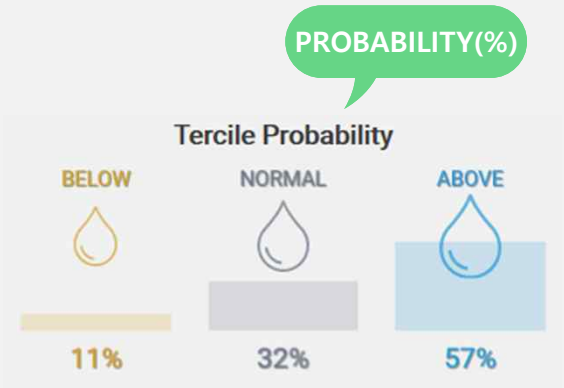
The last year of the period

The first year of the period



Validation period is from the beginning year to ‘the selected year -1’
If you selected 2026 in the year setting window, the last year will be 2025.
In this case, Selected year is 2026 AMJ and Validation period is AMJ 1991 to 2025

ROK-PI2



DISCRETE VALUES

TERCILE PROBABILITY

Average means making a representative value of a population.

Probability is not representative of the population itself, it's the likelihood of the events (representative value) occurring.

1

Step 1

Need to convert the discrete number (probability) to the continuous distribution (Probability Density Function)

Transforming

Deterministic values to continuous values or vice versa.

Transform while maintaining its properties using KDE

Kernel Density Estimation (KDE)

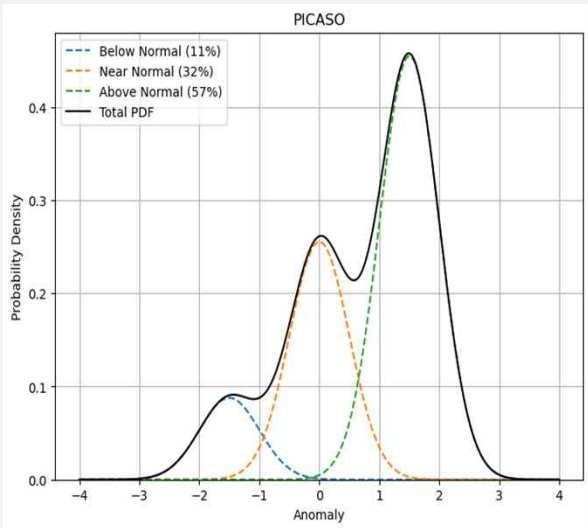
The Kernel density estimation is a fundamental data smoothing method where inferences about the population are made, based on a finite data sample. KDE is known to be more flexible

$$f_h(x) = \frac{1}{n}\sum_{i=1}^{n} K_h(x - x_i) = \frac{1}{nh}\sum_{i=1}^{n} K(\frac{x - x_i}{h})$$

$$\int_{-\infty}^{+\infty} K(x)dx = 1$$

$K(-x) = K(x)$ *for all values of x*

h is bandwidth



CONTINUOUS VALUES

PROBABILTIY DENSITY FUNCTION

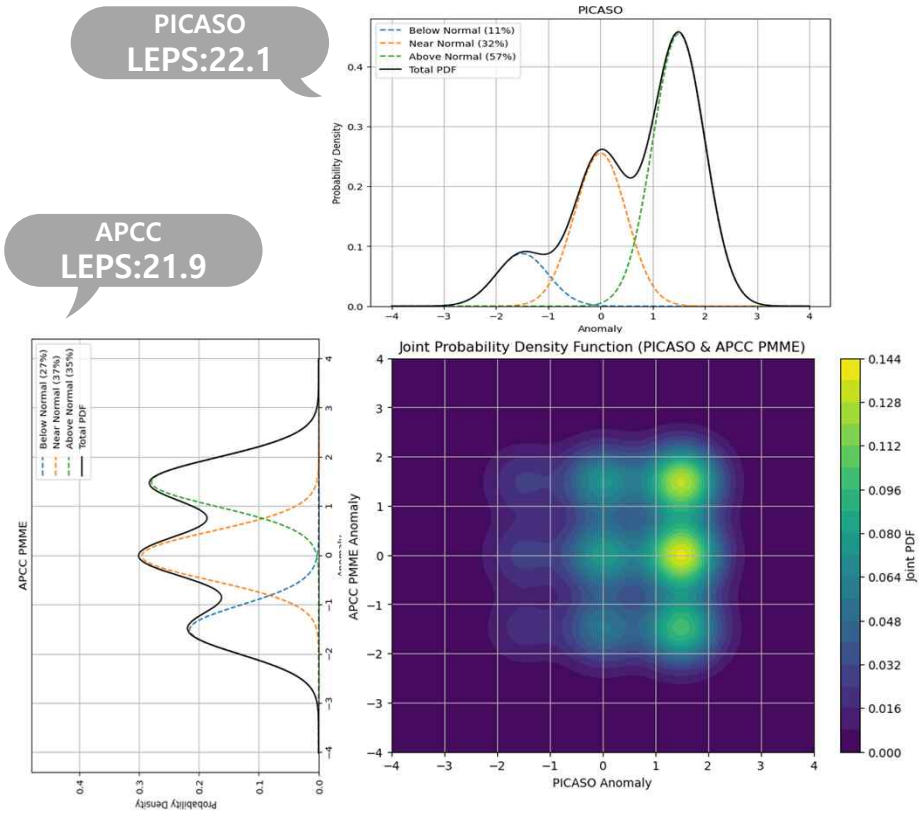
For probability, if we assume some statistics, including the type of distribution, we can estimate its original distribution.

The PDF contains information we need.

the probabilities are obtained by integrating over a certain domain of this PDF

2

Step 2



JOINT PROBABILITIES

To combine 2 PDFs, we need to use Joint Probability.

To fine the probability of both tercile predictions happening at the same time.

Multiply each value by itself, which means the weights are 1 to 1

The weighting of X and Y prediction is calculated based on the LEPS

$$C_{ij} = w_x X_i + w_y Y_j$$

$$w_x = \frac{LEPS_x{}^2}{LEPS_x{}^2 + LEPS_y{}^2} \quad , \quad w_y = \frac{LEPS_y{}^2}{LEPS_x{}^2 + LEPS_y{}^2}$$

$$※ \; w_x + w_y = 1$$

As the sum of two must equal 1. the two must be balanced.

$$w_{PICASO} = \frac{0.221^2}{0.221^2 + 0.219^2} = 0.504$$

PICASO : 50.4%

$$w_{APCC\_MME} = \frac{0.219^2}{0.221^2 + 0.219^2} = 0.496$$

APCC : 49.6%

The better prediction is mixed more.

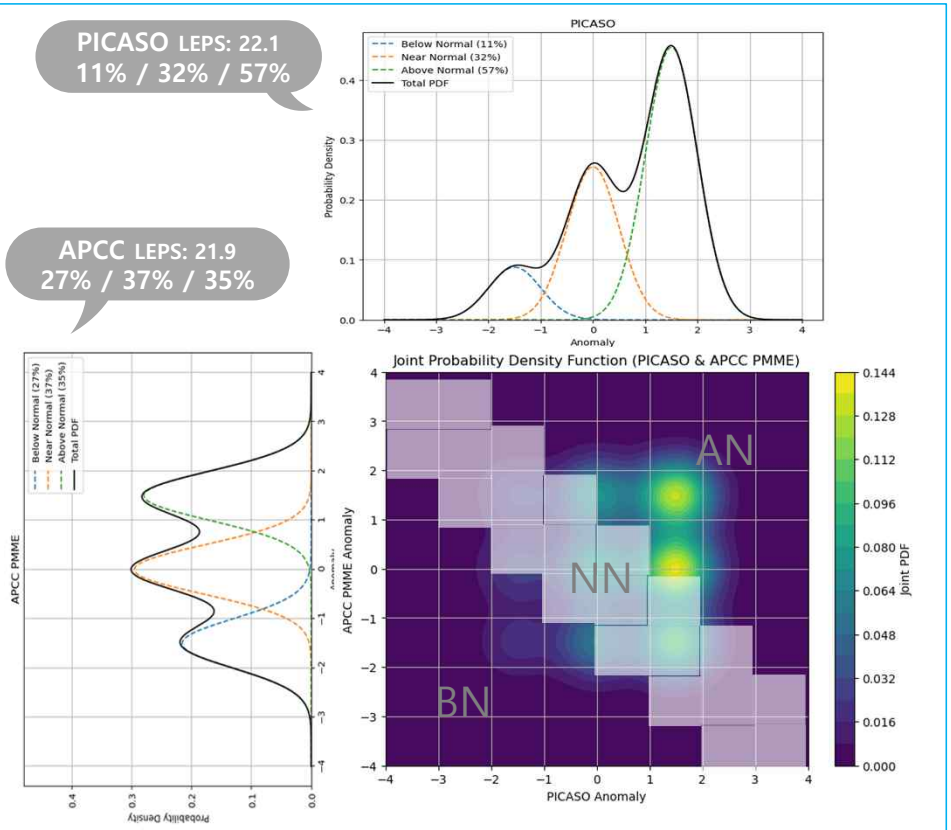
The better prediction is assessed by the predictability skill

WEIGHTING

Weighting is a Mixing Ratio

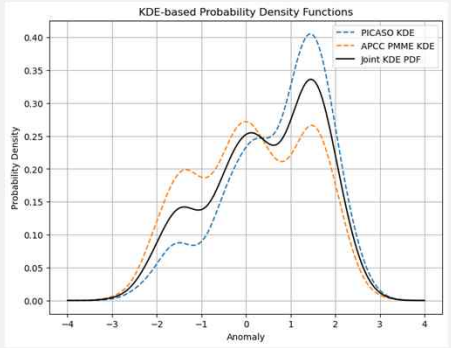
More of the better predictions will be more in the joint matrix than another.

Step 3

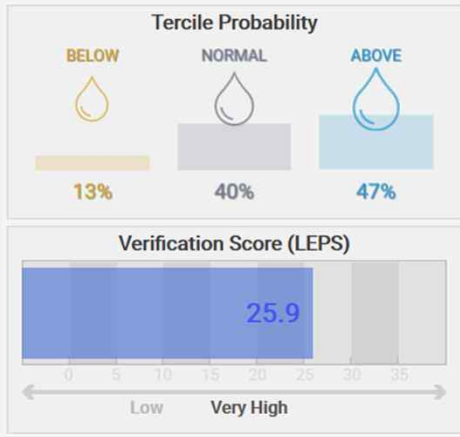


MAKING TERCILE PROBABILITY

Integrate over the domain corresponding to BN, NN, and AN to get the probability in this 2-D plane

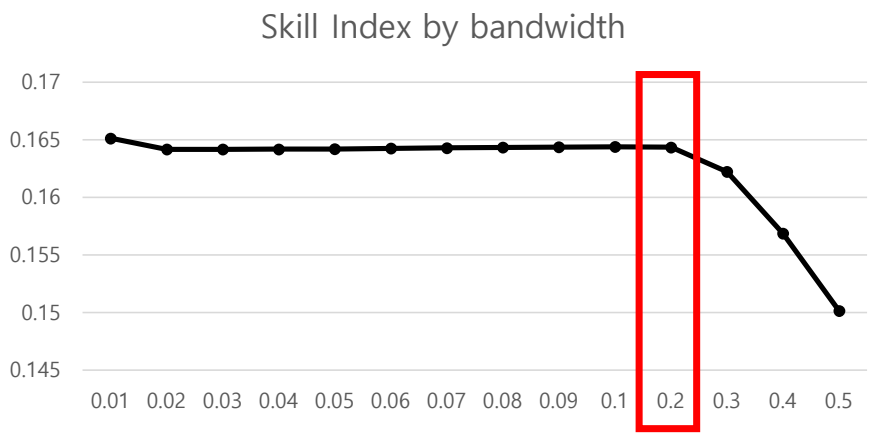


FYI; This graphs are not included in actual CoCO calculations.



CoCO PREDICTION

If LEPS was much lower than the input predictions, you wouldn't need to mix the predictions, but if the final LEPS score is as good as or better than the initial, you have a good reason to apply CoCO.



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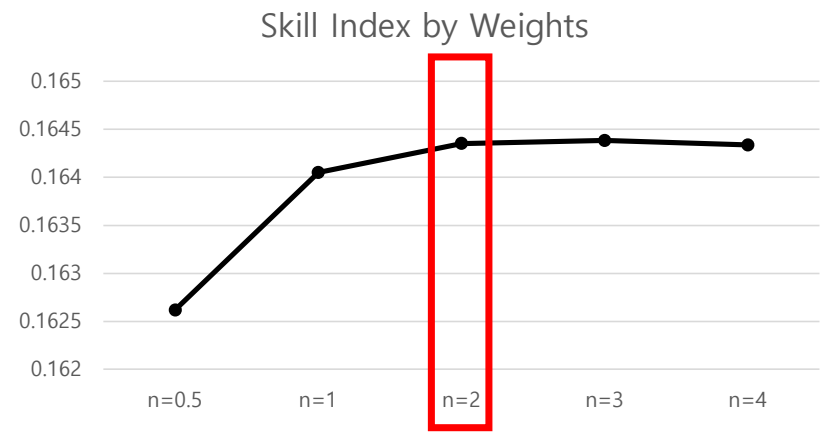
$$\int_{-\infty}^{+\infty} K(x)dx = 1$$

$K(-x) = K(x)$ *for all values of x*

h is bandwidth = 0.2



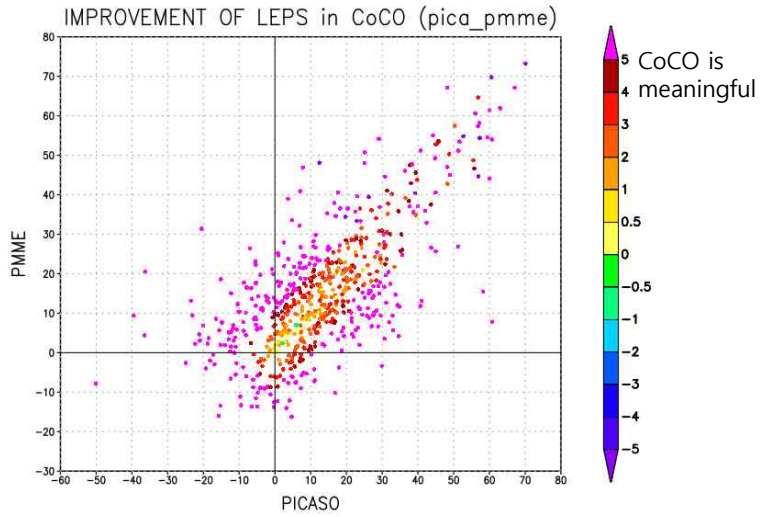
Weighting

The weighting of *X* and *Y* prediction is calculated based on the LEPS

$$C_{ij} = w_x X_i + w_y Y_j$$

$$w_x = \frac{{LEPS_x}^2}{{LEPS_x}^2 + {LEPS_y}^2} \quad , \quad w_y = \frac{{LEPS_y}^2}{{LEPS_x}^2 + {LEPS_y}^2}$$

※ $w_x + w_y = 1$

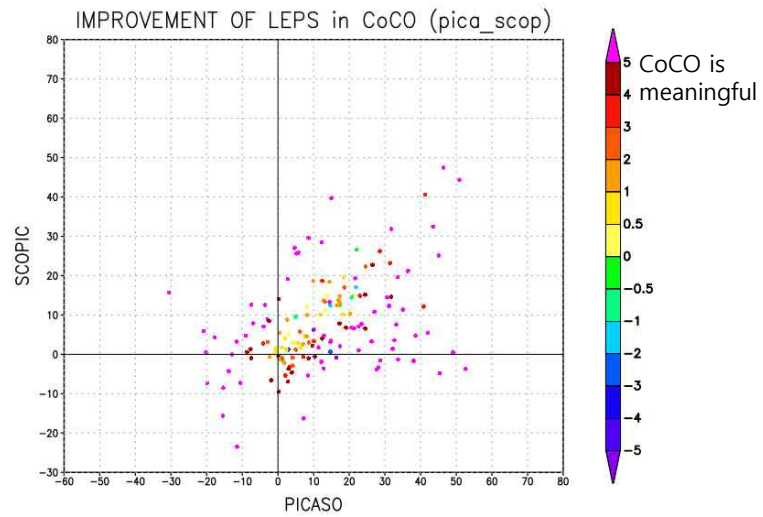


IMPROVEMENT of CoCO : PICASO+PMME

Weighting is a mixing ratio

53 Stations x 30 years x 12 seasons

9



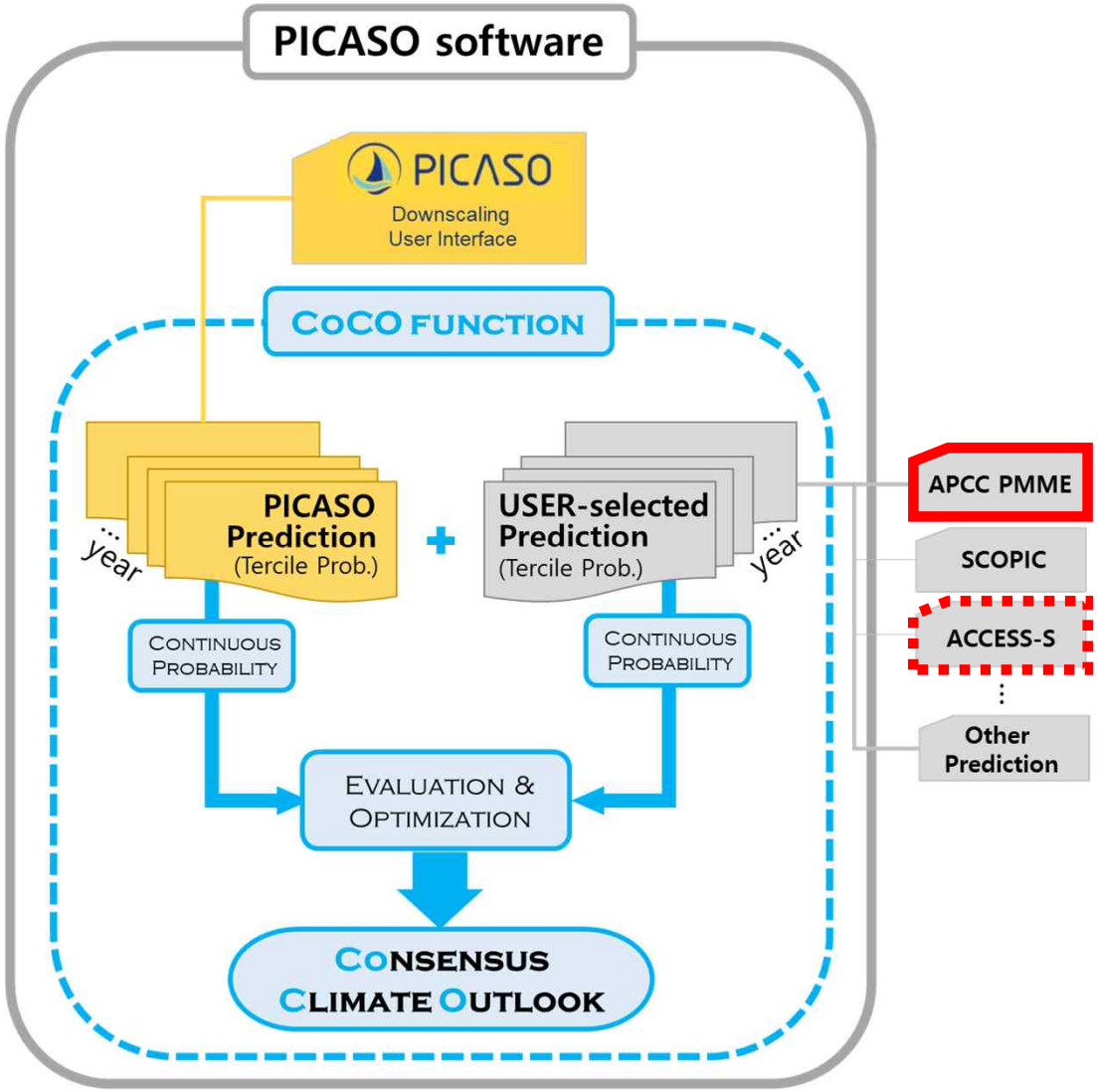
IMPROVEMENT of CoCO : PICASO+SCOPIC

Weighting is a mixing ratio

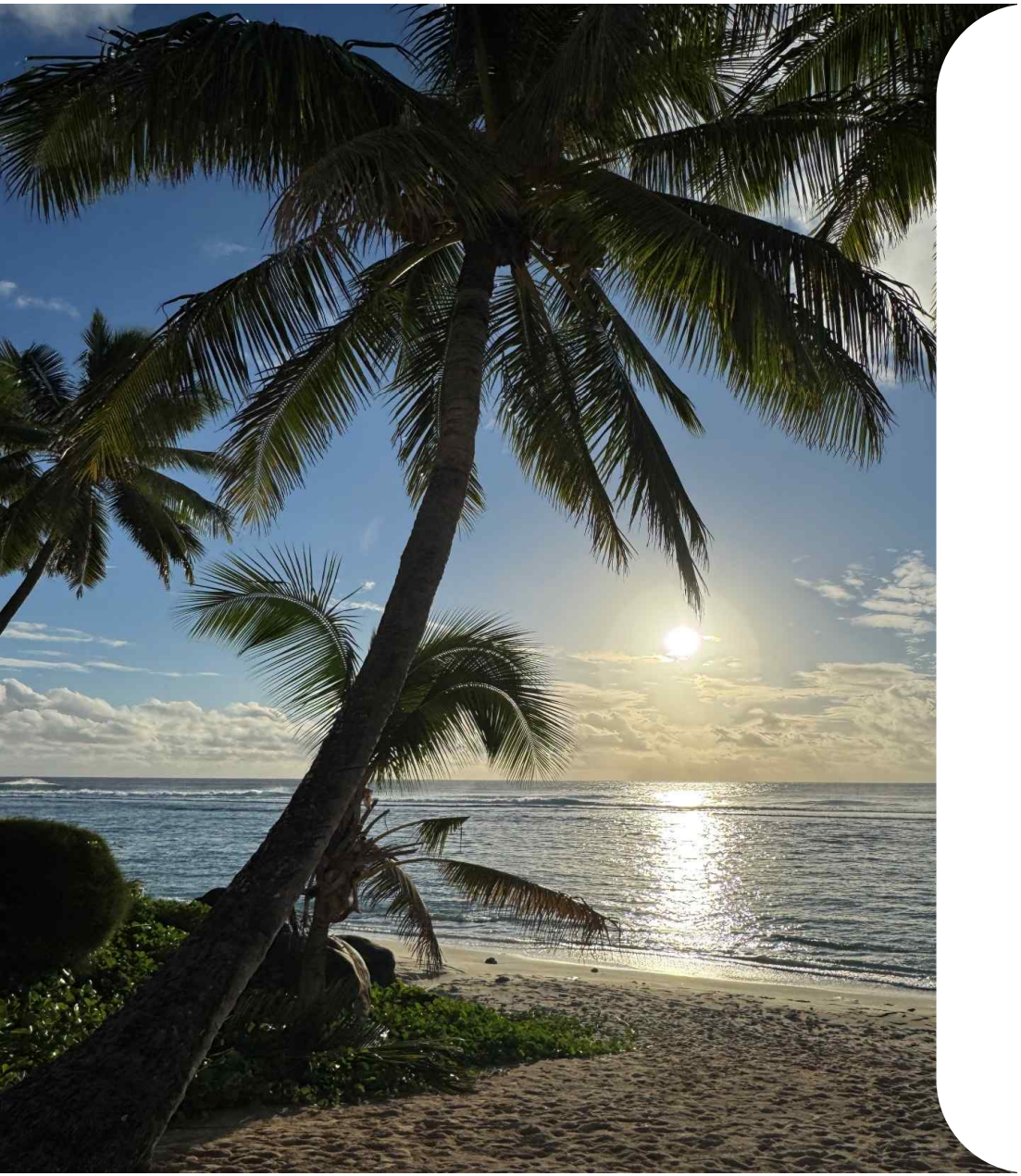
13 Stations x 11 years x 12 seasons

10

ROK-PI2


PICASO software
PICASO
Downscaling
User Interface
CoCO FUNCTION
PICASO
Prediction
(Tercile Prob.)
year
+
USER-selected
Prediction
(Tercile Prob.)
year
CONTINUOUS
PROBABILITY
CONTINUOUS
PROBABILITY
EVALUATION &
OPTIMIZATION
CONSENSUS
CLIMATE OUTLOOK
APCC PMME
SCOPIC
ACCESS-S
Other
Prediction

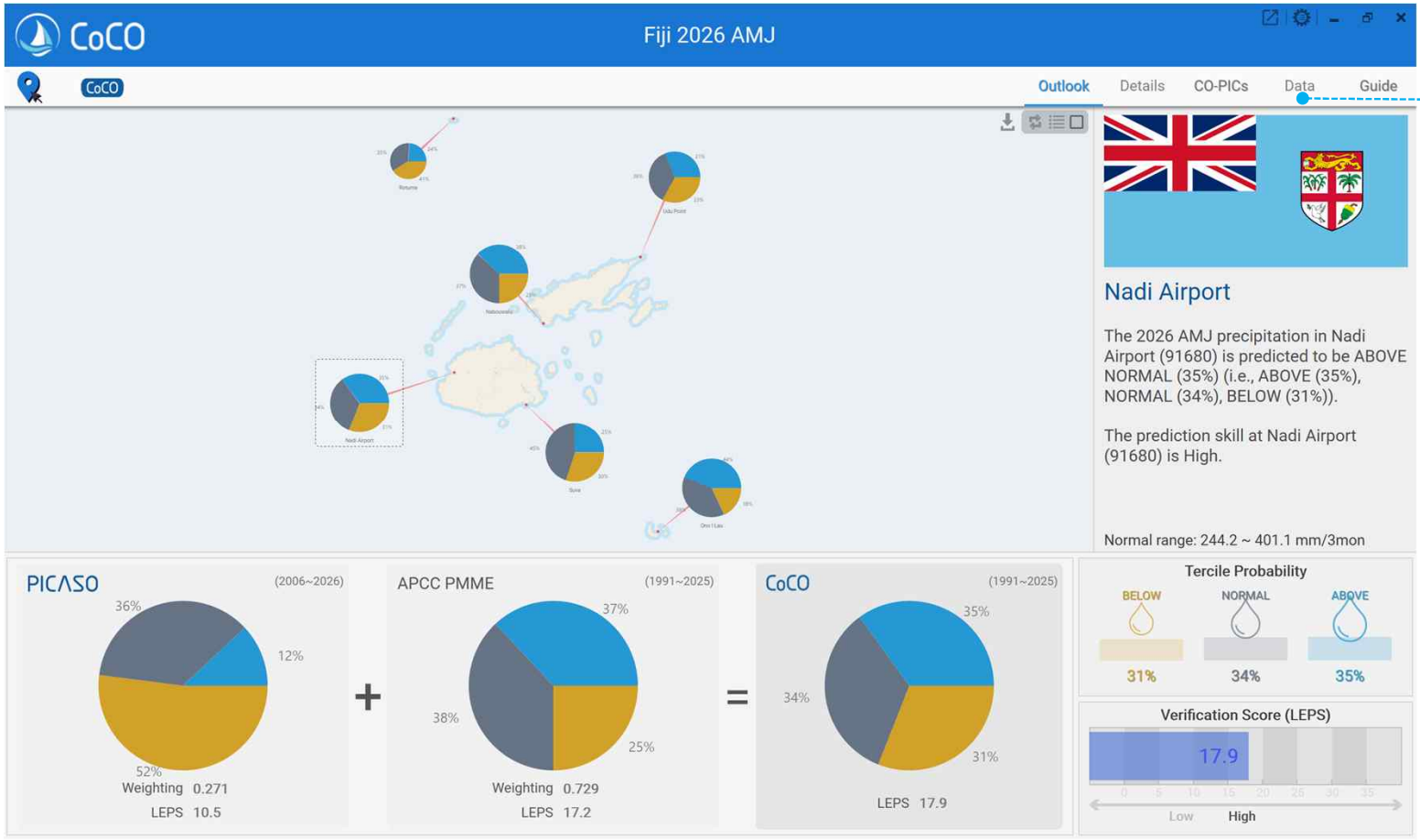
CoCO



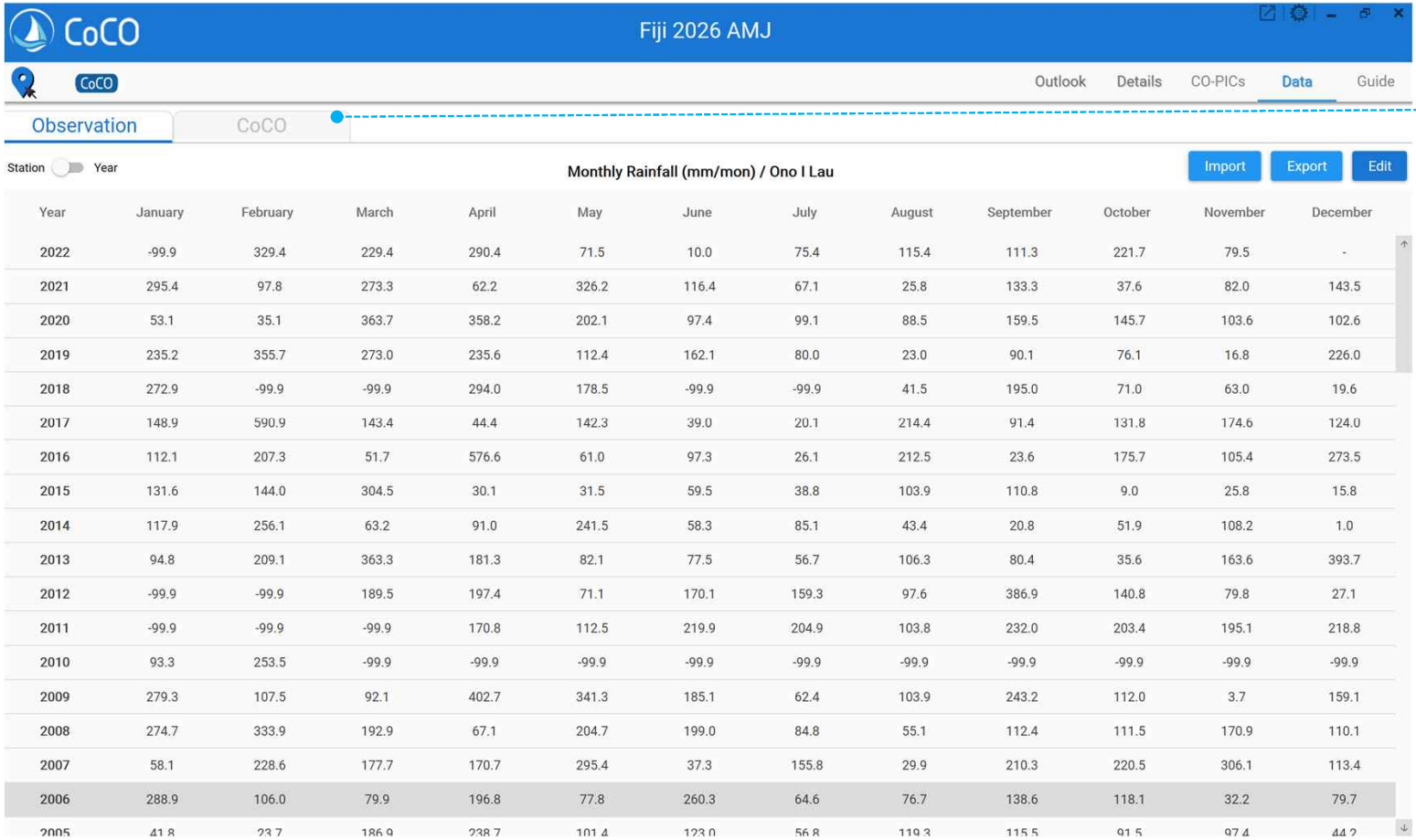
PICASO

It’s time for the ‘Hands-on Session’

- How to apply new prediction into CoCO prediction



The Data page is accessible whether in the CoCO mode or PICASO mode.



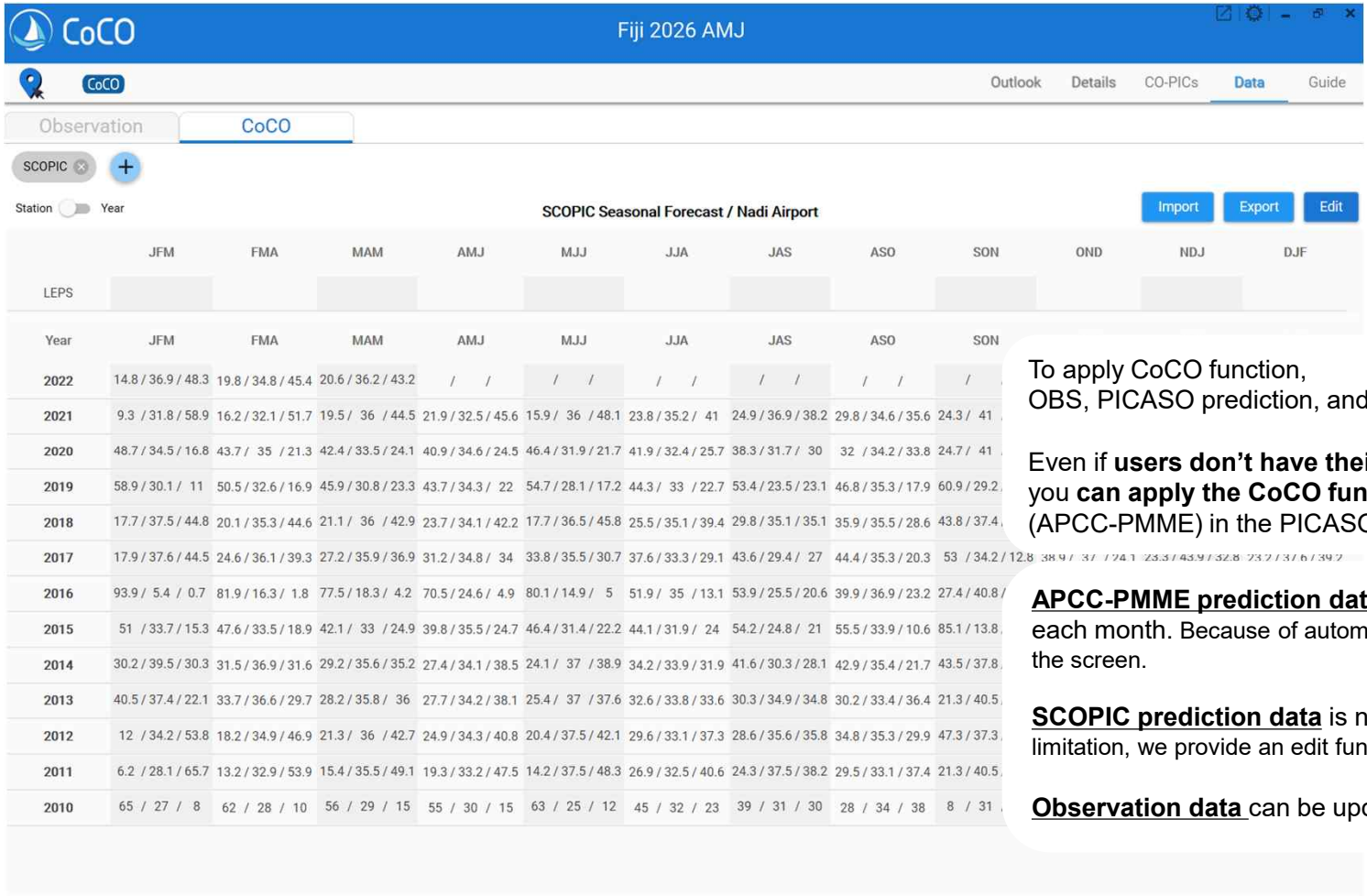
Year	January	February	March	April	May	June	July	August	September	October	November	December
2022	-99.9	329.4	229.4	290.4	71.5	10.0	75.4	115.4	111.3	221.7	79.5	-
2021	295.4	97.8	273.3	62.2	326.2	116.4	67.1	25.8	133.3	37.6	82.0	143.5
2020	53.1	35.1	363.7	358.2	202.1	97.4	99.1	88.5	159.5	145.7	103.6	102.6
2019	235.2	355.7	273.0	235.6	112.4	162.1	80.0	23.0	90.1	76.1	16.8	226.0
2018	272.9	-99.9	-99.9	294.0	178.5	-99.9	-99.9	41.5	195.0	71.0	63.0	19.6
2017	148.9	590.9	143.4	44.4	142.3	39.0	20.1	214.4	91.4	131.8	174.6	124.0
2016	112.1	207.3	51.7	576.6	61.0	97.3	26.1	212.5	23.6	175.7	105.4	273.5
2015	131.6	144.0	304.5	30.1	31.5	59.5	38.8	103.9	110.8	9.0	25.8	15.8
2014	117.9	256.1	63.2	91.0	241.5	58.3	85.1	43.4	20.8	51.9	108.2	1.0
2013	94.8	209.1	363.3	181.3	82.1	77.5	56.7	106.3	80.4	35.6	163.6	393.7
2012	-99.9	-99.9	189.5	197.4	71.1	170.1	159.3	97.6	386.9	140.8	79.8	27.1
2011	-99.9	-99.9	-99.9	170.8	112.5	219.9	204.9	103.8	232.0	203.4	195.1	218.8
2010	93.3	253.5	-99.9	-99.9	-99.9	-99.9	-99.9	-99.9	-99.9	-99.9	-99.9	-99.9
2009	279.3	107.5	92.1	402.7	341.3	185.1	62.4	103.9	243.2	112.0	3.7	159.1
2008	274.7	333.9	192.9	67.1	204.7	199.0	84.8	55.1	112.4	111.5	170.9	110.1
2007	58.1	228.6	177.7	170.7	295.4	37.3	155.8	29.9	210.3	220.5	306.1	113.4
2006	288.9	106.0	79.9	196.8	77.8	260.3	64.6	76.7	138.6	118.1	32.2	79.7
2005	41.8	23.7	186.9	238.7	101.4	123.0	56.8	119.3	115.5	91.5	97.4	44.2

Data can be edited in any mode is activated.

* Observation data is owned by PICs, so you'll need to input your own OBS.

Data input is the most important part of applying the CoCO function.

CoCO



	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ	DJF
LEPS												

Year	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON
2022	14.8 / 36.9 / 48.3	19.8 / 34.8 / 45.4	20.6 / 36.2 / 43.2	/ /	/ /	/ /	/ /	/ /	/
2021	9.3 / 31.8 / 58.9	16.2 / 32.1 / 51.7	19.5 / 36 / 44.5	21.9 / 32.5 / 45.6	15.9 / 36 / 48.1	23.8 / 35.2 / 41	24.9 / 36.9 / 38.2	29.8 / 34.6 / 35.6	24.3 / 41
2020	48.7 / 34.5 / 16.8	43.7 / 35 / 21.3	42.4 / 33.5 / 24.1	40.9 / 34.6 / 24.5	46.4 / 31.9 / 21.7	41.9 / 32.4 / 25.7	38.3 / 31.7 / 30	32 / 34.2 / 33.8	24.7 / 41
2019	58.9 / 30.1 / 11	50.5 / 32.6 / 16.9	45.9 / 30.8 / 23.3	43.7 / 34.3 / 22	54.7 / 28.1 / 17.2	44.3 / 33 / 22.7	53.4 / 23.5 / 23.1	46.8 / 35.3 / 17.9	60.9 / 29.2
2018	17.7 / 37.5 / 44.8	20.1 / 35.3 / 44.6	21.1 / 36 / 42.9	23.7 / 34.1 / 42.2	17.7 / 36.5 / 45.8	25.5 / 35.1 / 39.4	29.8 / 35.1 / 35.1	35.9 / 35.5 / 28.6	43.8 / 37.4
2017	17.9 / 37.6 / 44.5	24.6 / 36.1 / 39.3	27.2 / 35.9 / 36.9	31.2 / 34.8 / 34	33.8 / 35.5 / 30.7	37.6 / 33.3 / 29.1	43.6 / 29.4 / 27	44.4 / 35.3 / 20.3	53 / 34.2 / 12.8
2016	93.9 / 5.4 / 0.7	81.9 / 16.3 / 1.8	77.5 / 18.3 / 4.2	70.5 / 24.6 / 4.9	80.1 / 14.9 / 5	51.9 / 35 / 13.1	53.9 / 25.5 / 20.6	39.9 / 36.9 / 23.2	27.4 / 40.8 /
2015	51 / 33.7 / 15.3	47.6 / 33.5 / 18.9	42.1 / 33 / 24.9	39.8 / 35.5 / 24.7	46.4 / 31.4 / 22.2	44.1 / 31.9 / 24	54.2 / 24.8 / 21	55.5 / 33.9 / 10.6	85.1 / 13.8
2014	30.2 / 39.5 / 30.3	31.5 / 36.9 / 31.6	29.2 / 35.6 / 35.2	27.4 / 34.1 / 38.5	24.1 / 37 / 38.9	34.2 / 33.9 / 31.9	41.6 / 30.3 / 28.1	42.9 / 35.4 / 21.7	43.5 / 37.8
2013	40.5 / 37.4 / 22.1	33.7 / 36.6 / 29.7	28.2 / 35.8 / 36	27.7 / 34.2 / 38.1	25.4 / 37 / 37.6	32.6 / 33.8 / 33.6	30.3 / 34.9 / 34.8	30.2 / 33.4 / 36.4	21.3 / 40.5
2012	12 / 34.2 / 53.8	18.2 / 34.9 / 46.9	21.3 / 36 / 42.7	24.9 / 34.3 / 40.8	20.4 / 37.5 / 42.1	29.6 / 33.1 / 37.3	28.6 / 35.6 / 35.8	34.8 / 35.3 / 29.9	47.3 / 37.3
2011	6.2 / 28.1 / 65.7	13.2 / 32.9 / 53.9	15.4 / 35.5 / 49.1	19.3 / 33.2 / 47.5	14.2 / 37.5 / 48.3	26.9 / 32.5 / 40.6	24.3 / 37.5 / 38.2	29.5 / 33.1 / 37.4	21.3 / 40.5
2010	65 / 27 / 8	62 / 28 / 10	56 / 29 / 15	55 / 30 / 15	63 / 25 / 12	45 / 32 / 23	39 / 31 / 30	28 / 34 / 38	8 / 31

To apply CoCO function,
OBS, PICASO prediction, and other prediction data are needed.

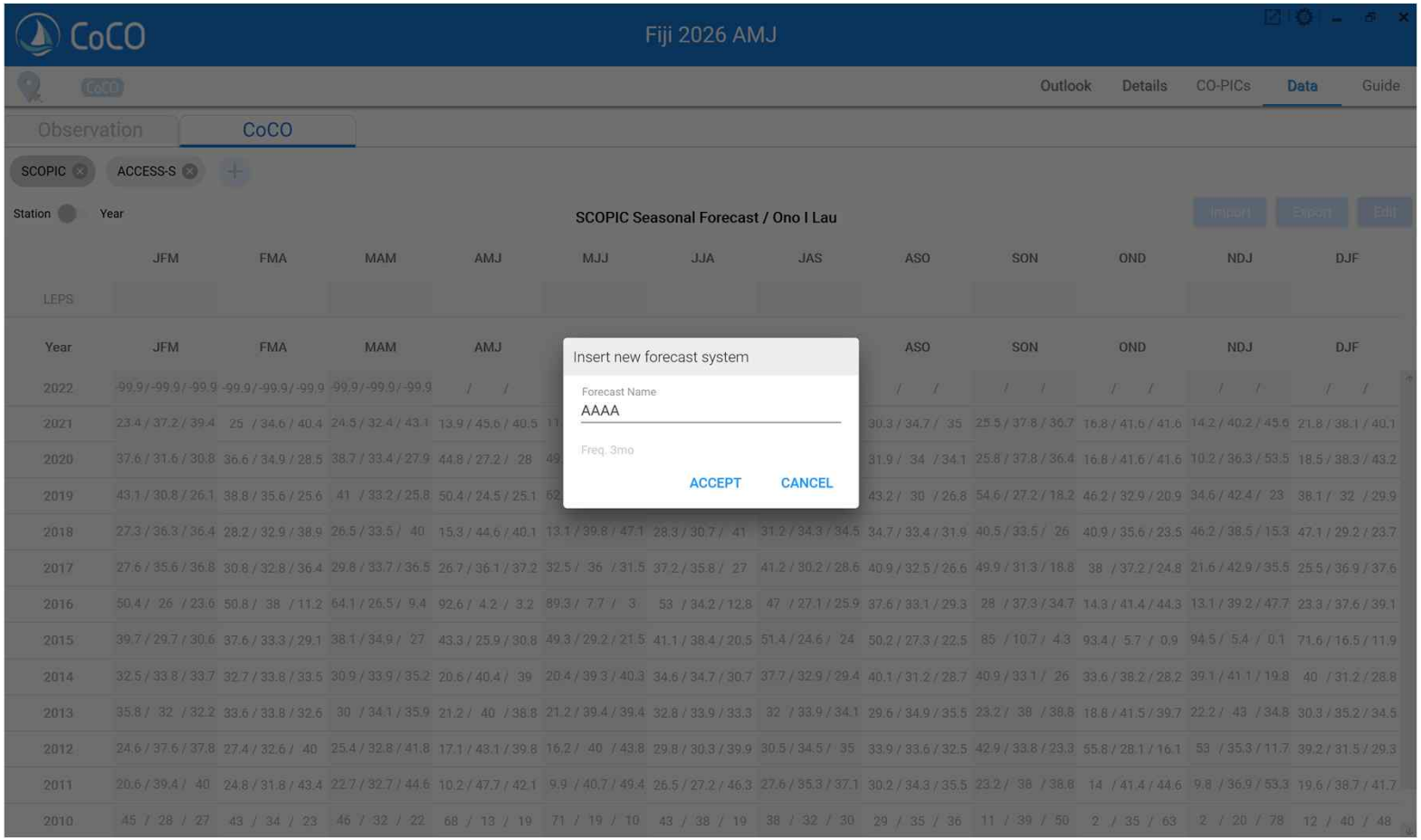
Even if **users don't have their own prediction data** to add,
you **can apply the CoCO function with the built-in data**
(APCC-PMME) in the PICASO v2 software.

APCC-PMME prediction data is automatically updated in the middle of each month. Because of automation, you cannot access APCC-PMME data on the screen.

SCOPIC prediction data is no longer available. Because of this kind of limitation, we provide an edit function to add more data.

Observation data can be updated by the user's

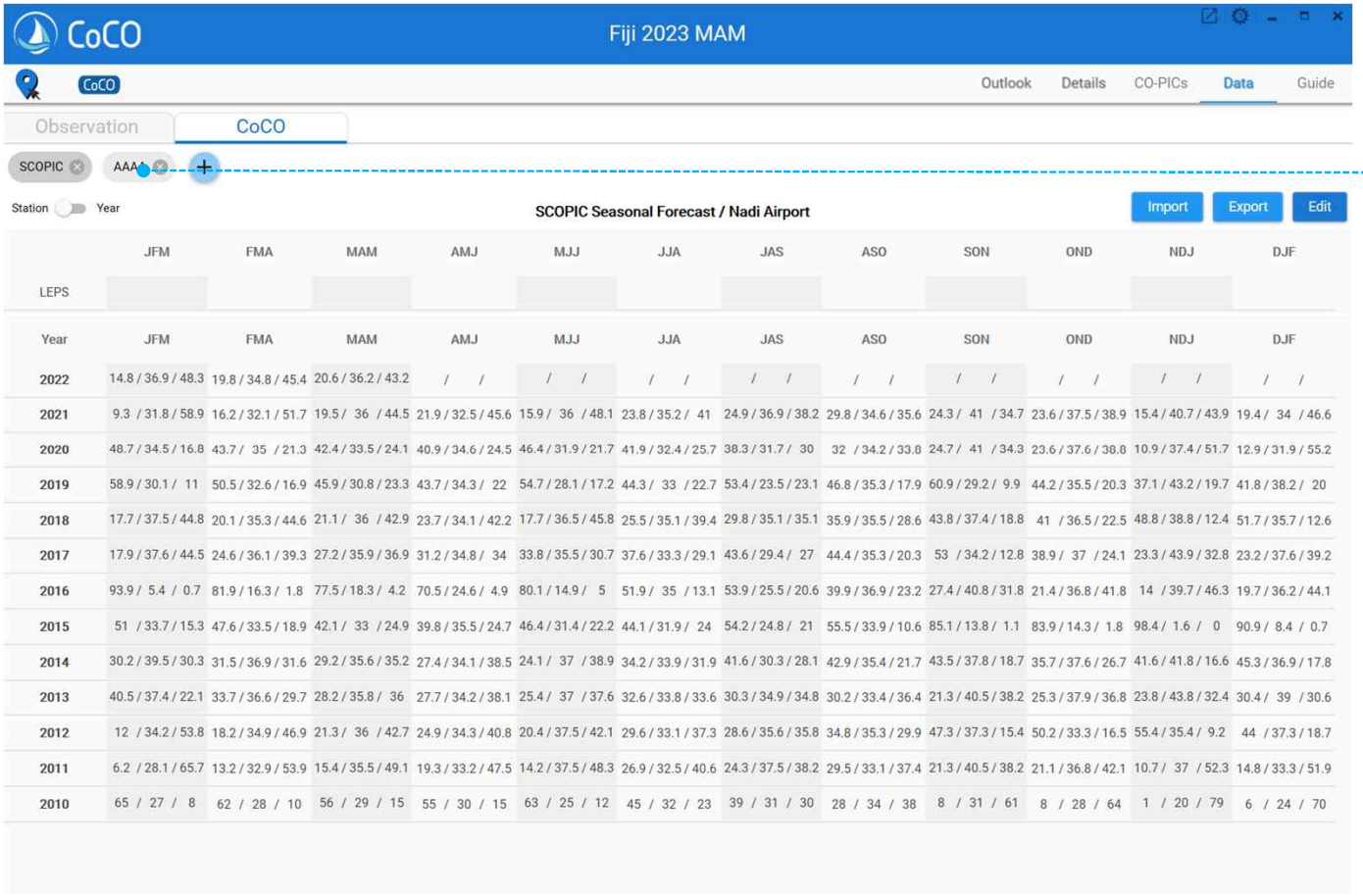
You can use + button to manually add your prediction data.



You can use the "+" button to add a new prediction model.

1. Type the name of the prediction system “AAAA” in the title pop-up.

2. After typing in the prediction name, and click ‘ACCEPT’ button.



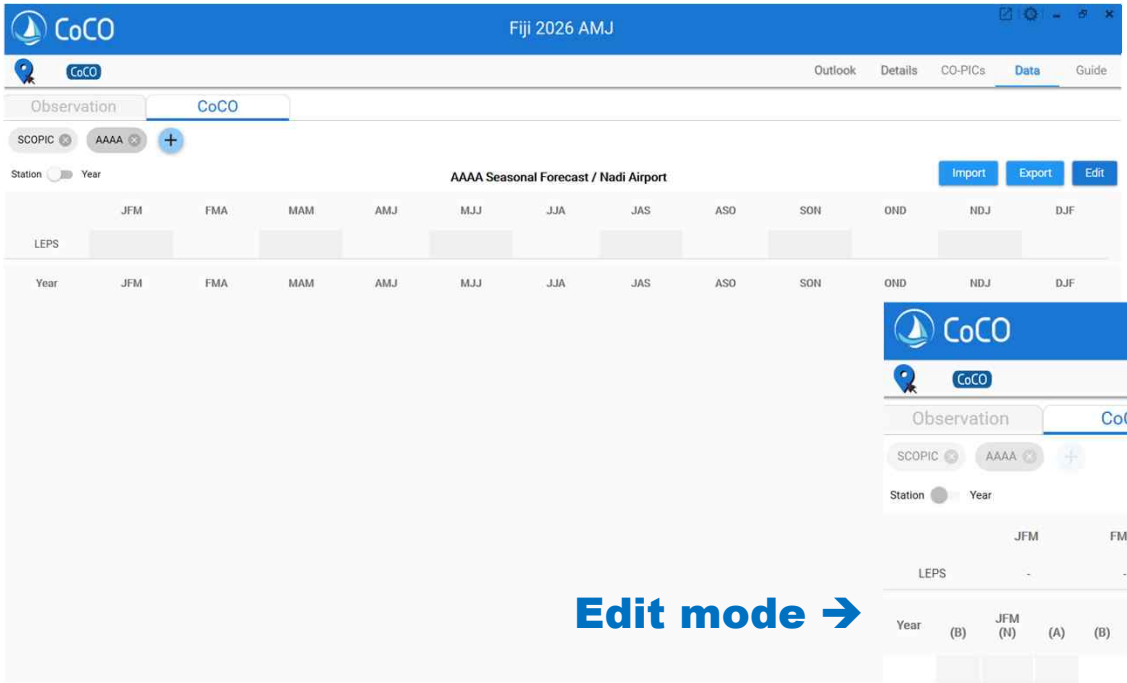
	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ	DJF
LEPS												

Year	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ	DJF
2022	14.8 / 36.9 / 48.3	19.8 / 34.8 / 45.4	20.6 / 36.2 / 43.2	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
2021	9.3 / 31.8 / 58.9	16.2 / 32.1 / 51.7	19.5 / 36 / 44.5	21.9 / 32.5 / 45.6	15.9 / 36 / 48.1	23.8 / 35.2 / 41	24.9 / 36.9 / 38.2	29.8 / 34.6 / 35.6	24.3 / 41 / 34.7	23.6 / 37.5 / 38.9	15.4 / 40.7 / 43.9	19.4 / 34 / 46.6
2020	48.7 / 34.5 / 16.8	43.7 / 35 / 21.3	42.4 / 33.5 / 24.1	40.9 / 34.6 / 24.5	46.4 / 31.9 / 21.7	41.9 / 32.4 / 25.7	38.3 / 31.7 / 30	32 / 34.2 / 33.8	24.7 / 41 / 34.3	23.6 / 37.6 / 38.8	10.9 / 37.4 / 51.7	12.9 / 31.9 / 55.2
2019	58.9 / 30.1 / 11	50.5 / 32.6 / 16.9	45.9 / 30.8 / 23.3	43.7 / 34.3 / 22	54.7 / 28.1 / 17.2	44.3 / 33 / 22.7	53.4 / 23.5 / 23.1	46.8 / 35.3 / 17.9	60.9 / 29.2 / 9.9	44.2 / 35.5 / 20.3	37.1 / 43.2 / 19.7	41.8 / 38.2 / 20
2018	17.7 / 37.5 / 44.8	20.1 / 35.3 / 44.6	21.1 / 36 / 42.9	23.7 / 34.1 / 42.2	17.7 / 36.5 / 45.8	25.5 / 35.1 / 39.4	29.8 / 35.1 / 35.1	35.9 / 35.5 / 28.6	43.8 / 37.4 / 18.8	41 / 36.5 / 22.5	48.8 / 38.8 / 12.4	51.7 / 35.7 / 12.6
2017	17.9 / 37.6 / 44.5	24.6 / 36.1 / 39.3	27.2 / 35.9 / 36.9	31.2 / 34.8 / 34	33.8 / 35.5 / 30.7	37.6 / 33.3 / 29.1	43.6 / 29.4 / 27	44.4 / 35.3 / 20.3	53 / 34.2 / 12.8	38.9 / 37 / 24.1	23.3 / 43.9 / 32.8	23.2 / 37.6 / 39.2
2016	93.9 / 5.4 / 0.7	81.9 / 16.3 / 1.8	77.5 / 18.3 / 4.2	70.5 / 24.6 / 4.9	80.1 / 14.9 / 5	51.9 / 35 / 13.1	53.9 / 25.5 / 20.6	39.9 / 36.9 / 23.2	27.4 / 40.8 / 31.8	21.4 / 36.8 / 41.8	14 / 39.7 / 46.3	19.7 / 36.2 / 44.1
2015	51 / 33.7 / 15.3	47.6 / 33.5 / 18.9	42.1 / 33 / 24.9	39.8 / 35.5 / 24.7	46.4 / 31.4 / 22.2	44.1 / 31.9 / 24	54.2 / 24.8 / 21	55.5 / 33.9 / 10.6	85.1 / 13.8 / 1.1	83.9 / 14.3 / 1.8	98.4 / 1.6 / 0	90.9 / 8.4 / 0.7
2014	30.2 / 39.5 / 30.3	31.5 / 36.9 / 31.6	29.2 / 35.6 / 35.2	27.4 / 34.1 / 38.5	24.1 / 37 / 38.9	34.2 / 33.9 / 31.9	41.6 / 30.3 / 28.1	42.9 / 35.4 / 21.7	43.5 / 37.8 / 18.7	35.7 / 37.6 / 26.7	41.6 / 41.8 / 16.6	45.3 / 36.9 / 17.8
2013	40.5 / 37.4 / 22.1	33.7 / 36.6 / 29.7	28.2 / 35.8 / 36	27.7 / 34.2 / 38.1	25.4 / 37 / 37.6	32.6 / 33.8 / 33.6	30.3 / 34.9 / 34.8	30.2 / 33.4 / 36.4	21.3 / 40.5 / 38.2	25.3 / 37.9 / 36.8	23.8 / 43.8 / 32.4	30.4 / 39 / 30.6
2012	12 / 34.2 / 53.8	18.2 / 34.9 / 46.9	21.3 / 36 / 42.7	24.9 / 34.3 / 40.8	20.4 / 37.5 / 42.1	29.6 / 33.1 / 37.3	28.6 / 35.6 / 35.8	34.8 / 35.3 / 29.9	47.3 / 37.3 / 15.4	50.2 / 33.3 / 16.5	55.4 / 35.4 / 9.2	44 / 37.3 / 18.7
2011	6.2 / 28.1 / 65.7	13.2 / 32.9 / 53.9	15.4 / 35.5 / 49.1	19.3 / 33.2 / 47.5	14.2 / 37.5 / 48.3	26.9 / 32.5 / 40.6	24.3 / 37.5 / 38.2	29.5 / 33.1 / 37.4	21.3 / 40.5 / 38.2	21.1 / 36.8 / 42.1	10.7 / 37 / 52.3	14.8 / 33.3 / 51.9
2010	65 / 27 / 8	62 / 28 / 10	56 / 29 / 15	55 / 30 / 15	63 / 25 / 12	45 / 32 / 23	39 / 31 / 30	28 / 34 / 38	8 / 31 / 61	8 / 28 / 64	1 / 20 / 79	6 / 24 / 70

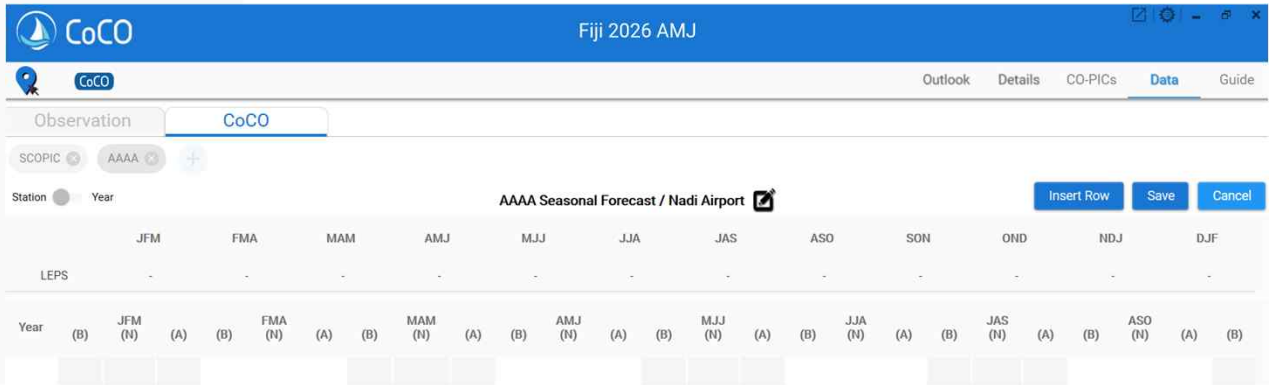
the AAAA icon will appear next to SCOPIC icon.

If you click this “AAAA” icon, AAAA data page will turn up.

CoCO



Edit mode →



In the AAAA data page,

you can type the prediction data manually or import a data file.

For manual input, press "**edit**" button,

then the page turn to **edit mode** so you can type numbers.

Make sure that the **sum of BN, NN, and AN** amounts to **100**.

Data will be saved only when the total of three probabilities is exactly 100.

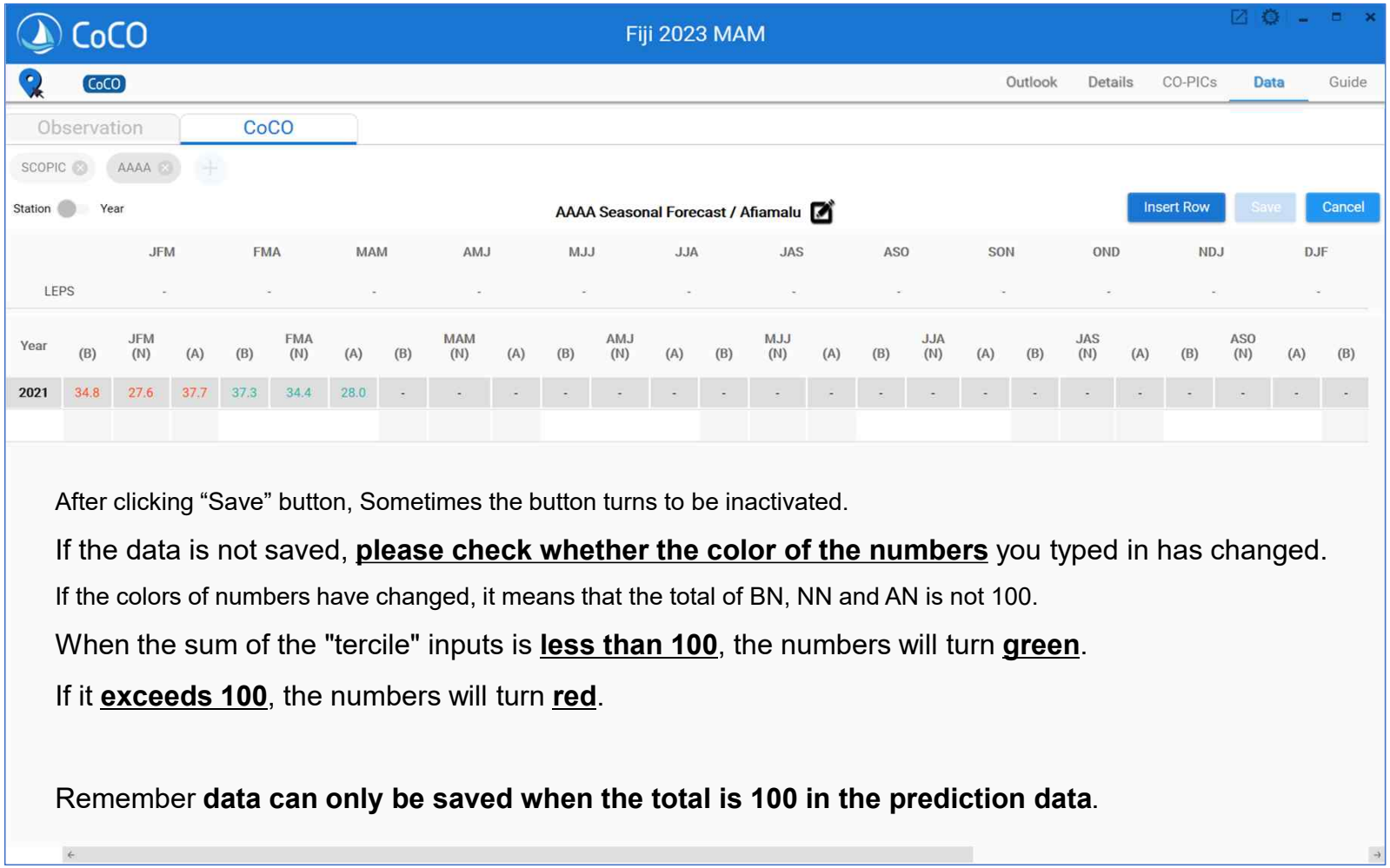
Caution!

If there are **missing values, type -999.9** so that missing values are not included in the calculation.

Missing values should not be recorded as 0 although it will be displayed as 0 for technical reason.

When you finish editing, press the save button.

CoCO



After clicking “Save” button, Sometimes the button turns to be inactivated.

If the data is not saved, **please check whether the color of the numbers** you typed in has changed.

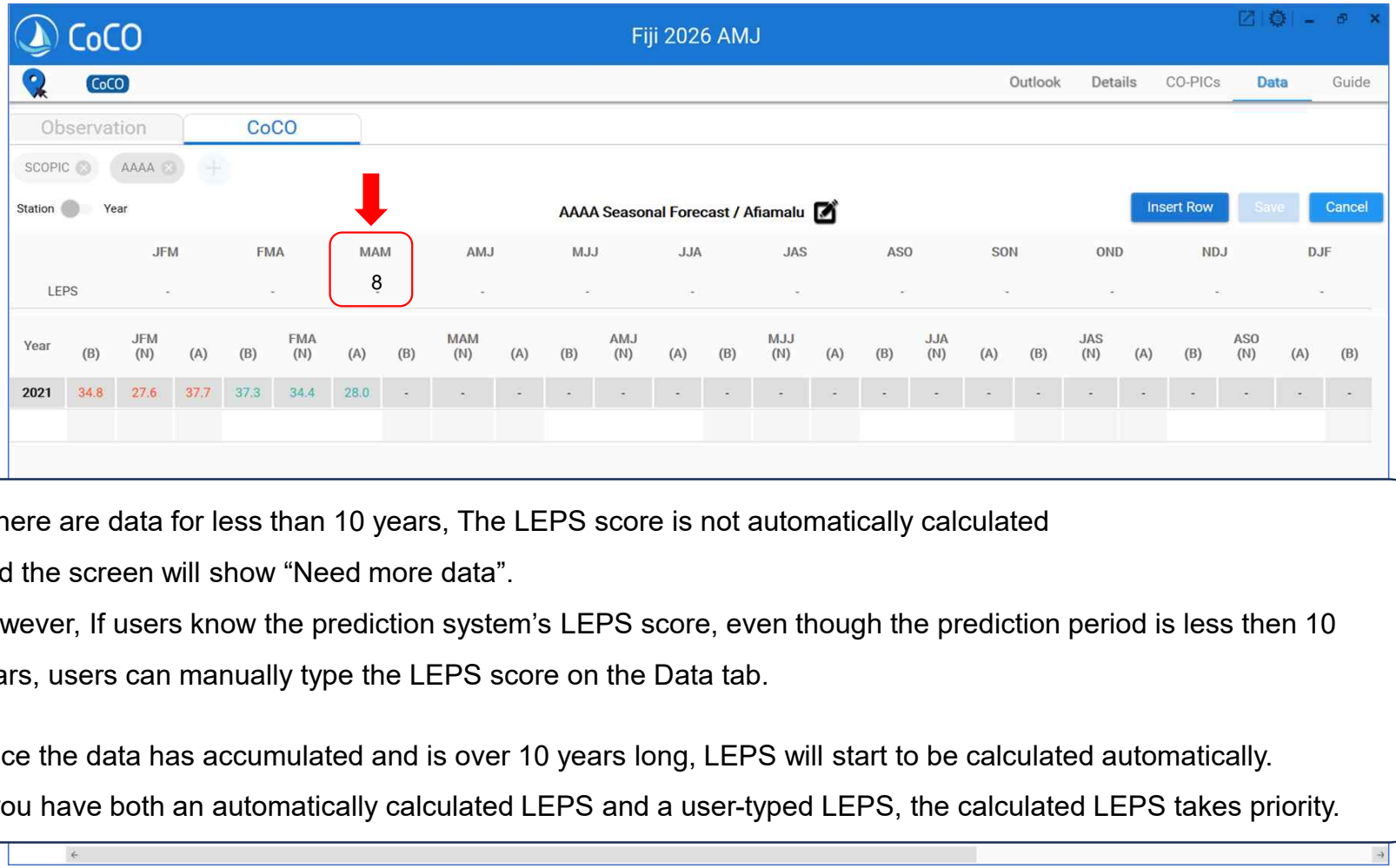
If the colors of numbers have changed, it means that the total of BN, NN and AN is not 100.

When the sum of the "tercile" inputs is **less than 100**, the numbers will turn **green**.

If it **exceeds 100**, the numbers will turn **red**.

Remember **data can only be saved when the total is 100 in the prediction data**.

CoCO



If there are data for less than 10 years, The LEPS score is not automatically calculated

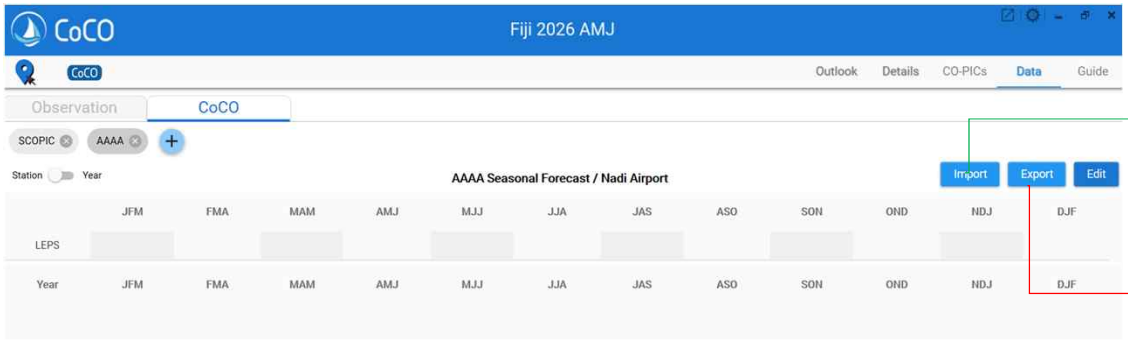
And the screen will show “Need more data”.

However, If users know the prediction system’s LEPS score, even though the prediction period is less then 10 years, users can manually type the LEPS score on the Data tab.

Once the data has accumulated and is over 10 years long, LEPS will start to be calculated automatically.

If you have both an automatically calculated LEPS and a user-typed LEPS, the calculated LEPS takes priority.

CoCO



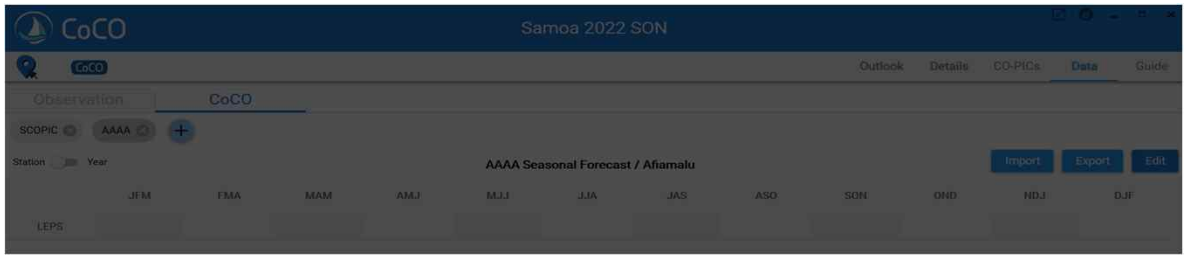
Import function

If users have the data as a file in the form of **csv**, Users can use the import function for data input.

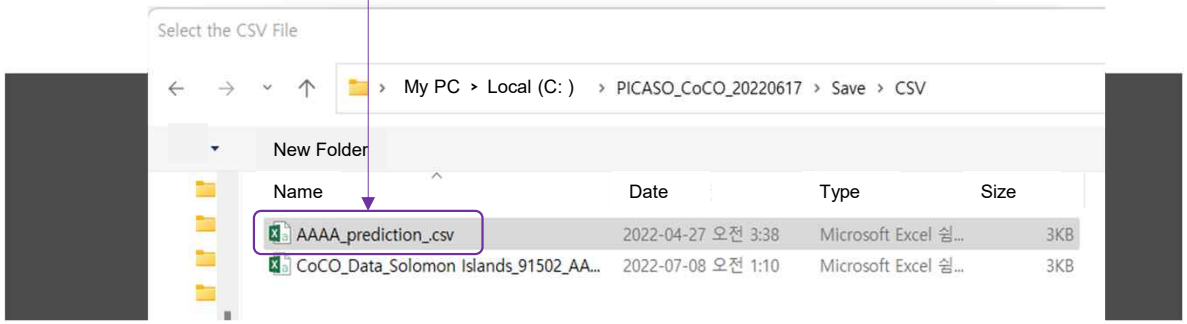
Export function

Users can download the inserted data as a file using the export function.

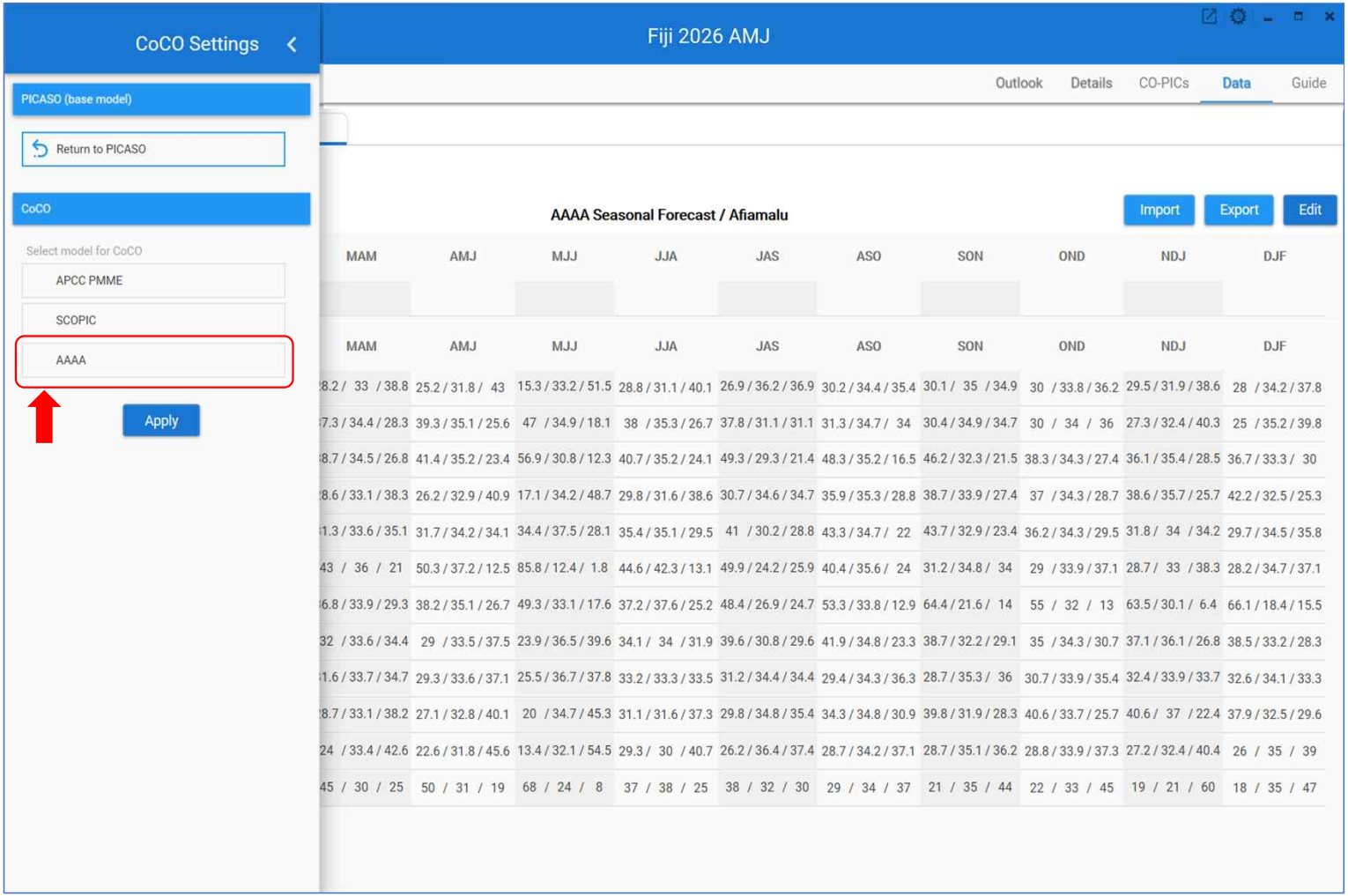
Data file will be saved as a [csv file format].



DATA IMPORT
WORK IN PROGRESS

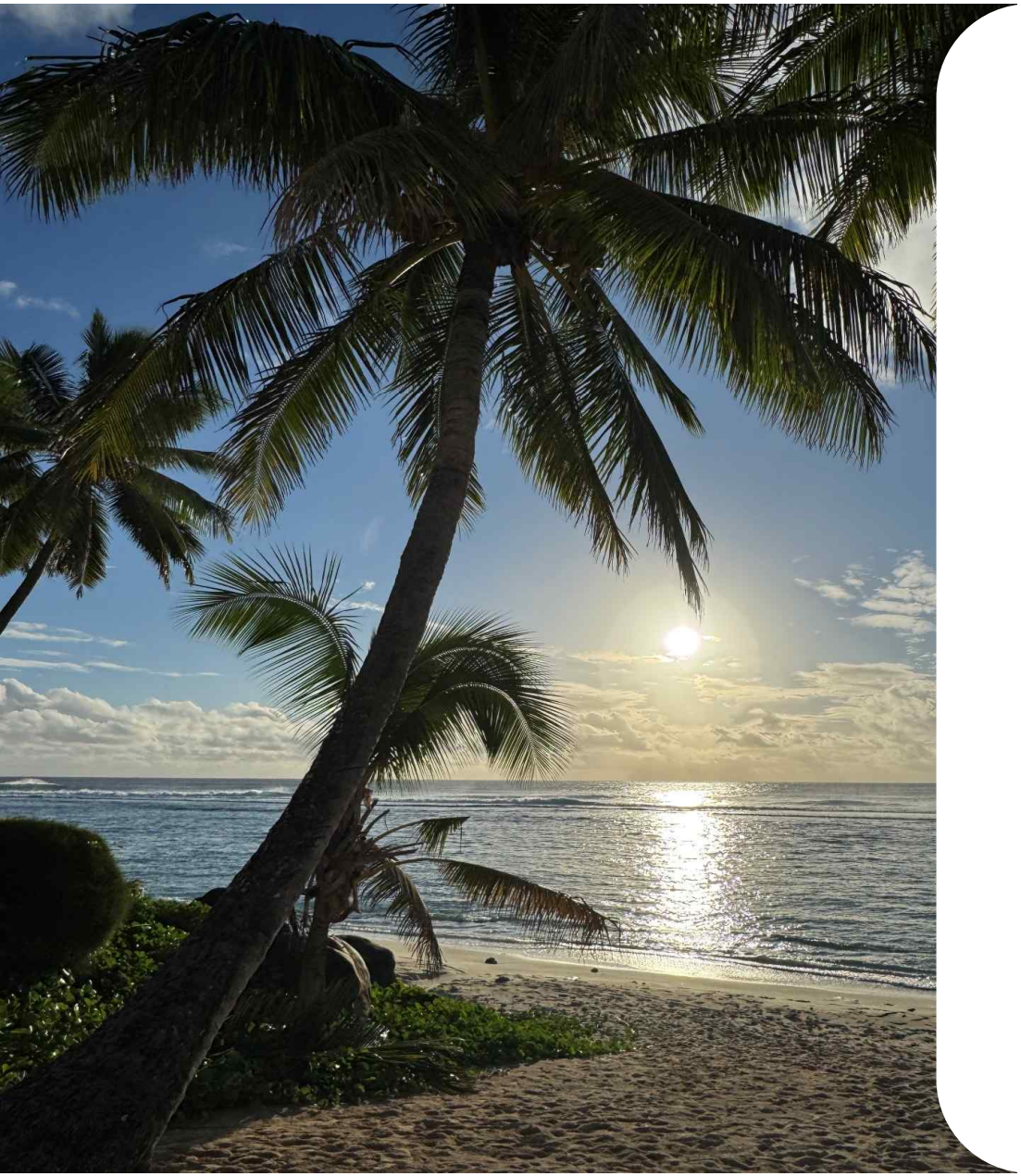


CoCO



After adding prediction data on the Data tab and Open the '**CoCO setting**' window, the prediction title you typed will be added to the 'Selected model for CoCO' menu.

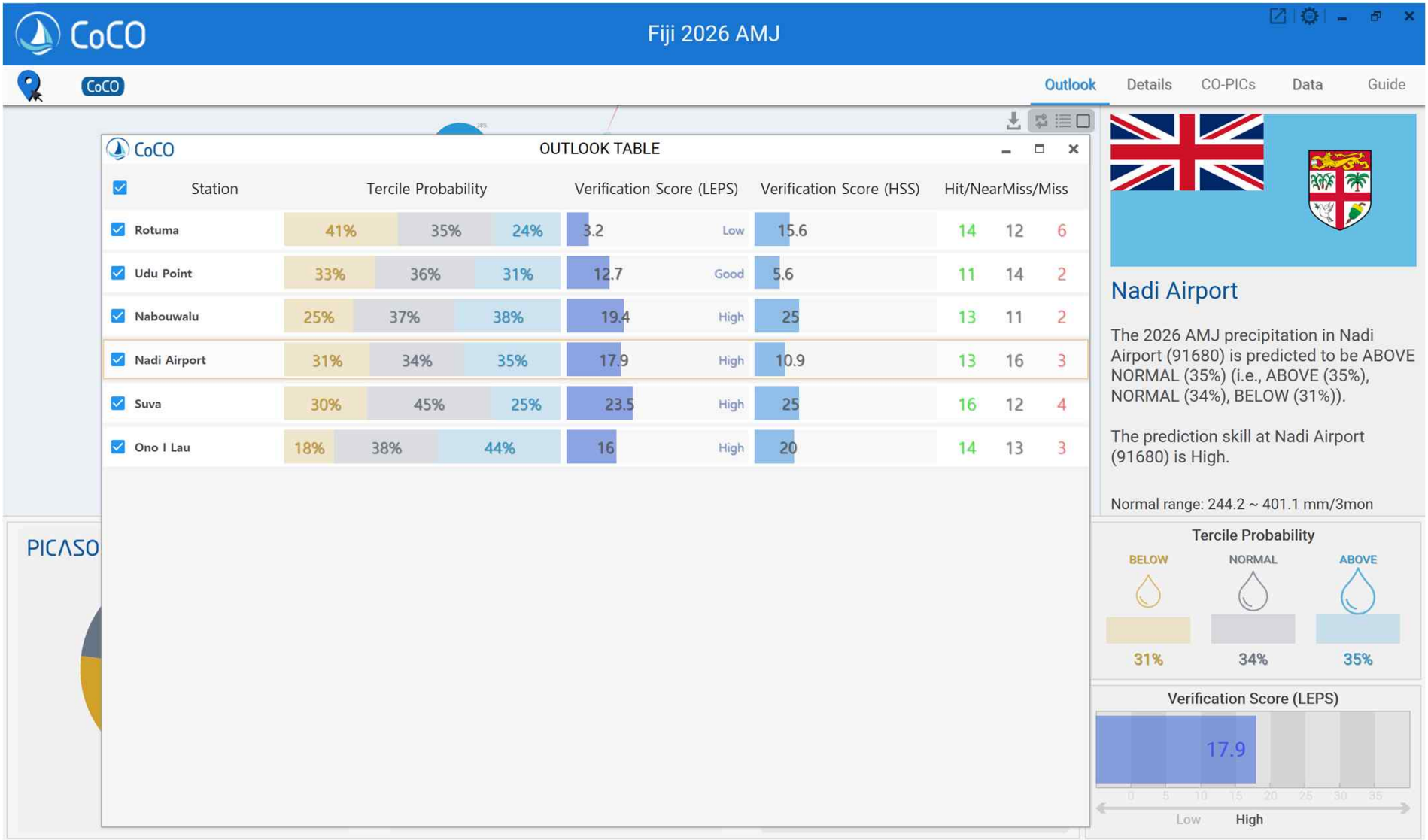
By selecting the added prediction title, Users can produce a new CoCO prediction which combines PICASO prediction and newly added prediction.



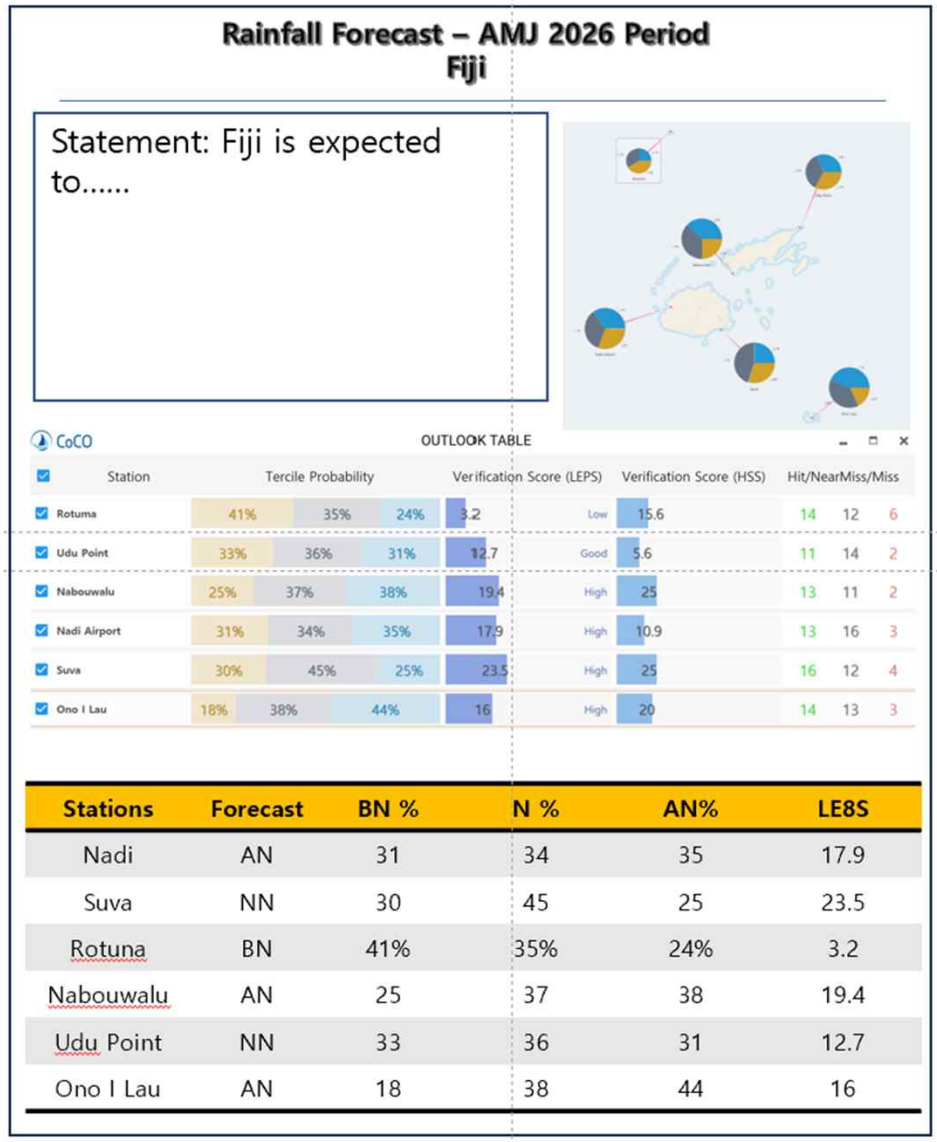
PICASO

Hands-on by Mr. Choi

- To add Prediction data and its LEPS


CoCO
Fiji 2026 AMJ
CoCO
Outlook
Details
CO-PICs
Data
Guide
CoCO
OUTLOOK TABLE
Station
Tercile Probability
Verification Score (LEPS)
Verification Score (HSS)
Hit/NearMiss/Miss
Rotuma 41% 35% 24% 3.2 Low 15.6 14 12 6
Udu Point 33% 36% 31% 12.7 Good 5.6 11 14 2
Nabouwalu 25% 37% 38% 19.4 High 25 13 11 2
Nadi Airport 31% 34% 35% 17.9 High 10.9 13 16 3
Suva 30% 45% 25% 23.5 High 25 16 12 4
Ono I Lau 18% 38% 44% 16 High 20 14 13 3
Nadi Airport
The 2026 AMJ precipitation in Nadi Airport (91680) is predicted to be ABOVE NORMAL (35%) (i.e., ABOVE (35%), NORMAL (34%), BELOW (31%)).
The prediction skill at Nadi Airport (91680) is High.
Normal range: 244.2 ~ 401.1 mm/3mon
PICASO
Tercile Probability
BELOW
NORMAL
ABOVE
31%
34%
35%
Verification Score (LEPS)
17.9
0 5 10 15 20 25 30 35
Low
High

CoCO



Stations	Forecast	BN %	N %	AN%	LE8S
Nadi	AN	31	34	35	17.9
Suva	NN	30	45	25	23.5
Rotuna	BN	41%	35%	24%	3.2
Nabouwalu	AN	25	37	38	19.4
Udu Point	NN	33	36	31	12.7
Ono I Lau	AN	18	38	44	16

Template Path:
USB:/data/ **ClimateOutlookTmplate.pptx**

Fill in the template with your own results!
Make your own seasonal climate outlook for your country

Before lunch time ends,
Please bring the Outlook file
to me in person or
send it to the email (lee.climate@gmail.com)

You're free to use this space until lunch time to work on your own outlooks.

CoCO

More meaningful information for a better future

Thank you

Jong-Hwa Lee (Seoul National University)