

# TAFWarn : A "Heads-up" Monitoring Tool

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## Monitoring

TAFWarn provides forecasters in the Canadian Meteorological Aviation Centre (CMAC) in Edmonton and Montreal with an easy to interpret, high glance value tool to monitor Terminal Aerodrome Forecast (TAF) sites. It incorporates current problems, current information, future problems and a TAF health score.

TAFWarn is displayed via a webpage hosted on a local system. In addition to the main summary table display, additional information is displayed via the use of pop-up windows (see below/right).

TAFWarn works with local dynamic workload allocation software (Roving TAF) to show forecasters TAFs they are responsible for (image top right this panel).

Sites monitored - can be sorted by importance/urgency

# of Lightning strikes within 30NM in last 30 min

Desks being monitored (configurable)

Upcoming/present problems

"Health" of TAF

Special observation was issued 5 minutes ago

TAFs about to expire (end)

HEALTH	WIND CAT WX	SITE	NOV(17Z)	1 HR (18Z)	2 HR (19Z)	3 HR (20Z)	4 HR (21Z)	5 HR (22Z)
9 5 9	(10)CYTL	/CTGY	---	---	---	---	---	---
8 8 9	CYJT	OK	CTGY	---	---	---	---	---
9 8 9	CYGV	OK	CTGY	---	---	---	---	---
9 9 9	CYYT	OK	CTGY	---	---	---	---	---
9 5 9	CYYB *SP(4)	OK	OK	OK	CTGY	---	---	---
9 6 9	CYSC *SP(5)	OK	OK	OK	CTGY	---	---	---
9 6 9	CYQB *SP(5)	OK	OK	OK	---	---	---	---
9 9 9	CWSA	OK	OK	OK	---	---	---	---
9 5 9	CYAH	OK	OK	OK	CTGY/WX	---	---	---

## Heads-up : Future TAF problems

TAFWarn shows a list of TAFs that do not conform to the observations based upon the Canadian manual of standards and procedures for Aviation Weather Forecasts (MANAIR). There are 3 reasons a TAF may not be in compliance: Wind (WND), Category (CTGY), Weather/Obscurations (WX). The reason(s) for the inconsistency are given in the summary table.

TAFWarn uses persistence to forecast future problems with current TAFs. "If the observations don't change, your TAF will go bust at XXZ". Method works very good for forecast changes in weather that may not occur. Examples : clearing of fog (see right) or frontal passages. Less useful for non-forecast changes.

Placing the mouse over the problem (image bottom right this panel) the forecaster can easily see what problem is and what part of TAF is causing problem.

Current problems

Future/upcoming problems

SITE	NOV(17Z)	1 HR (18Z)	2 HR (19Z)	3 HR (20Z)	4 HR (21Z)	5 HR (22Z)
CYQR	WND/CTGY	---	CTGY/WX	---	---	---
CYXE	OK	CTGY	CTGY/WX	---	---	---
CYGX	OK	CTGY	---	---	---	---
CYLL	OK	OK	CTGY/WX	---	---	---
CYMM	OK	OK	CTGY	---	---	---
CYWG	OK	OK	OK	CTGY/WX	---	---
CYVT	OK	OK	OK	OK	OK	OK

New problem (different limit/reason)

--- same problem as previous hour

Details of problem(s)

Last 2 observations

Latest TAF

Line in TAF where problem occurs

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CYLL - 3 HR (19Z)
CAT : TAF ABV/EQ 1 1/2SM / TAF ABV/EQ 400FT
WX/VIS : TAF MISG FG / TAF WX >= ESM
CYLL 081519Z 20007KT 1/2SM FZFG SCT002 RMK FG2ST2 VIS VRB
1/4-3/4 SKY44=
CYLL 081600Z 17005KT 1/2SM FZFG BKN002 M18/M21 A2973 RMK
FG2ST2 VIS VRB 1/4-3/4 RIME ON INDCR SLP127 SKY66=
AMD CYLL 081559Z 081524 19004KT 1/2SM FZFG OVC002 BECMG 1619
P6SM NSW SKC
FM1900Z 13006KT P6SM FEW250
RMK NXT FCST BY 18Z=
    
```

## TAF Health

Health summarized into wind, category, and weather factors

Summary table of health of TAFs being monitored

Using fuzzy logic methods the TAF is compared to the current observation. It uses 3 factors: Wind (WND), Category including ceiling and visibility (CAT), and weather (WX). Each factor is given a % (reduced to 0-9 for summary table). Overall health calculated as a product of all 3 factors. Pop-ups show TAF health and individual factors they give an explanation if a factor is below 80%.

**TAF Health** – an attempt to quantify how closely the TAF matches the current observation on a scale from 0 to 100.

Wind health is based upon a vector difference between forecast and observed wind vectors. Adjusts wind speed to include gusts (average of sustained and gusts).

Category health is based on linear interpolation between main and tempo conditions (as well as max cig/vis and min cig/vis pairings). Uses weighting scheme to give more importance to low ceilings and visibilities.

Weather health is based upon occurring/not occurring logic. Uses a weighting scheme to give to more importance to significant weather types (FZRA, TSGR).

Sample of mouse over TAF information

HEALTH	WIND CAT WX	SITE	NOV(17Z)	1 HR (18Z)	2 HR (19Z)	3 HR (20Z)	4 HR (21Z)	5 HR (22Z)
7 3 7	CYGL	OK	OK	OK	OK	OK	OK	OK
3 8 9	CY	OK	OK	OK	OK	OK	OK	OK
8 3 9	CY	OK	OK	OK	OK	OK	OK	OK
8 3 9	CY	OK	OK	OK	OK	OK	OK	OK
6 6 9	CY	OK	OK	OK	OK	OK	OK	OK
9 6 7	CY	OK	OK	OK	OK	OK	OK	OK
4 9 9	CY	OK	OK	OK	OK	OK	OK	OK
9 5 9	CY	OK	OK	OK	OK	OK	OK	OK
8 6 9	CY	OK	OK	OK	OK	OK	OK	OK

LA GRANDE RIVIERE, QC  
400.18/14 800.28/14 ELV:639 FT PH:  
CYGL 042100Z 26005KT 15SM FEW019 M17/M19 A2983 RMK SC1 SLP120 51033 SKY00=  
CYGL 042200Z 27005KT 15SM FEW020 M18/M20 A2986 RMK SC1 SLP132 SKY00=  
CYGL 041738Z 041818 27012KT P6SM -SN FEW012 BKN025 TEMPO 1824 2SM -SN SCT010 BKN020  
FM0000Z VRB03KT P6SM BKN025 TEMPO 0012 BKN020  
FM1200Z 10006KT P6SM FEW008 BKN025 TEMPO 1216 5SM -SN  
FM1600Z 12008KT 6SM -SN OVC025 TEMPO 1618 11/2SM -SN VV010  
RMK NXT FCST BY 00Z=

Sample of mouse over information on TAF Health

HEALTH	WIND CAT WX	SITE	NOV(17Z)	1 HR (18Z)	2 HR (19Z)	3 HR (20Z)	4 HR (21Z)	5 HR (22Z)
7 3 7	CYGL	OK	OK	OK	OK	OK	OK	OK
3 8 9	CY	OK	OK	OK	OK	OK	OK	OK
8 3 9	CY	OK	OK	OK	OK	OK	OK	OK
8 3 9	CY	OK	OK	OK	OK	OK	OK	OK
6 6 9	CY	OK	OK	OK	OK	OK	OK	OK
9 6 7	CY	OK	OK	OK	OK	OK	OK	OK

**CYGL - HEALTH: 17%**

WIND: 72% - 27012KT vs obs 27005KT  
CAT: 33% - 025,P6SM vs obs UNL,P6SM  
WX: 75% - HAS SN

Overall health

Wind health and explanation

Category health and explanation

Weather health and explanation

## Future Plans

Version 2.X

- Revise/update the health routines
- Include the influence of continuing problems
- Incorporate poor use of TEMPOs
- Show BECMGs that have already occurred
- Show graph of health for last 3 hours

Version 3.X

- Incorporate model/climatology guidance for projecting a future health based on an ensemble approach
- Incorporate alerting/warning directly into operational workstation and monitoring tools
- Incorporate Health into pre-transmission checks