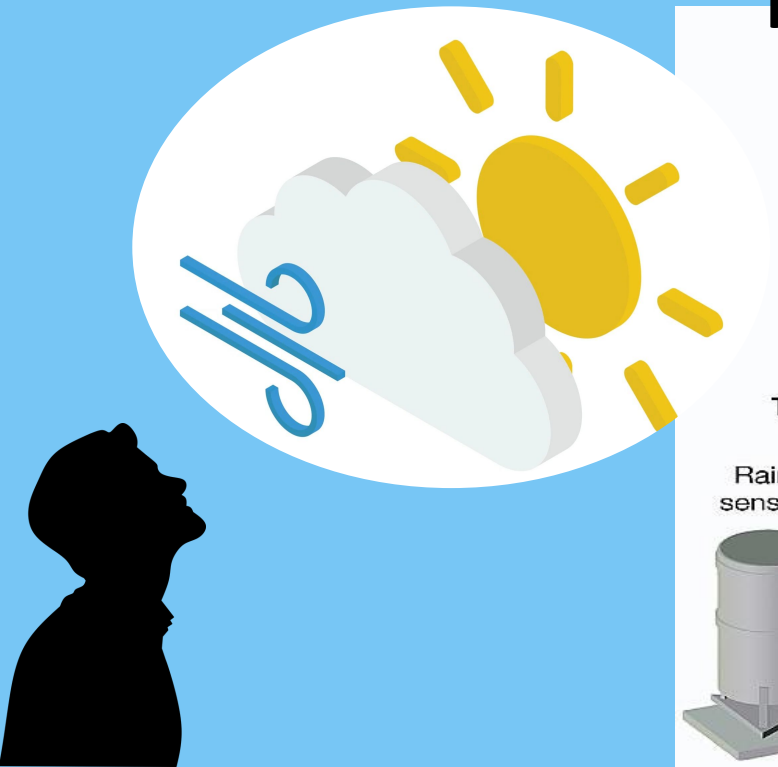
What the Contract Weather Observers Want You to Know

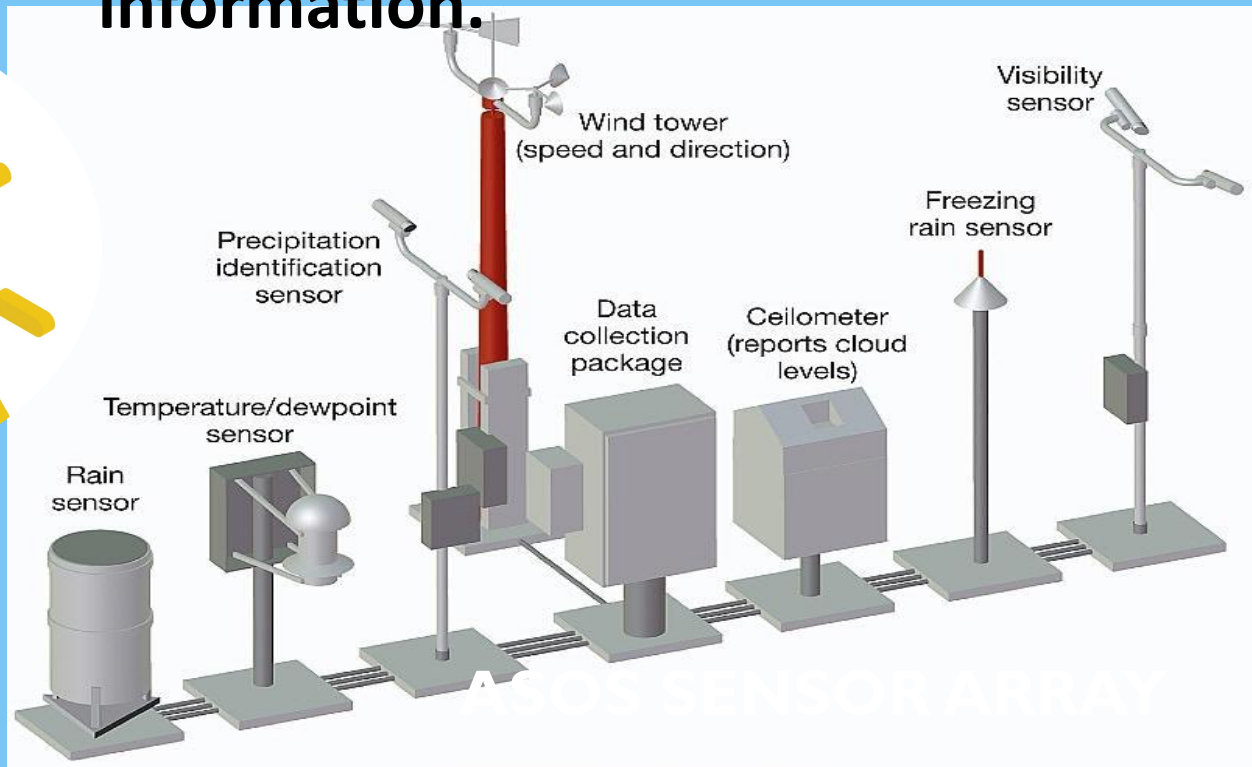
by Daniel Dexter

Senior Weather Observer @ ELP

The Job of a Contract Weather Observer (CWO)

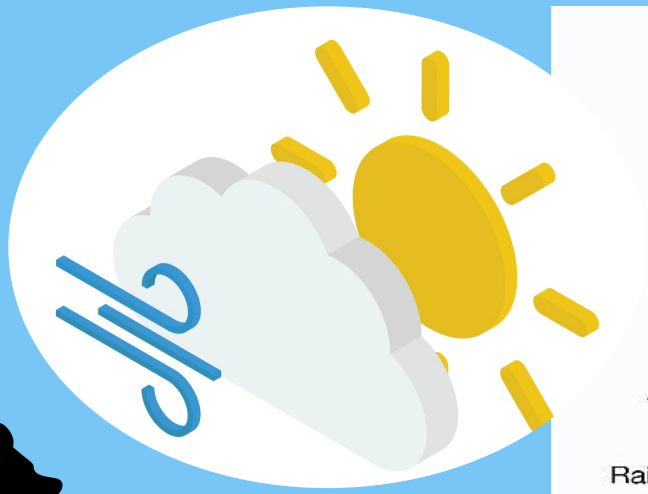
CWOs use their observation skills together with ASOS data to give you the most accurate airfield weather information.

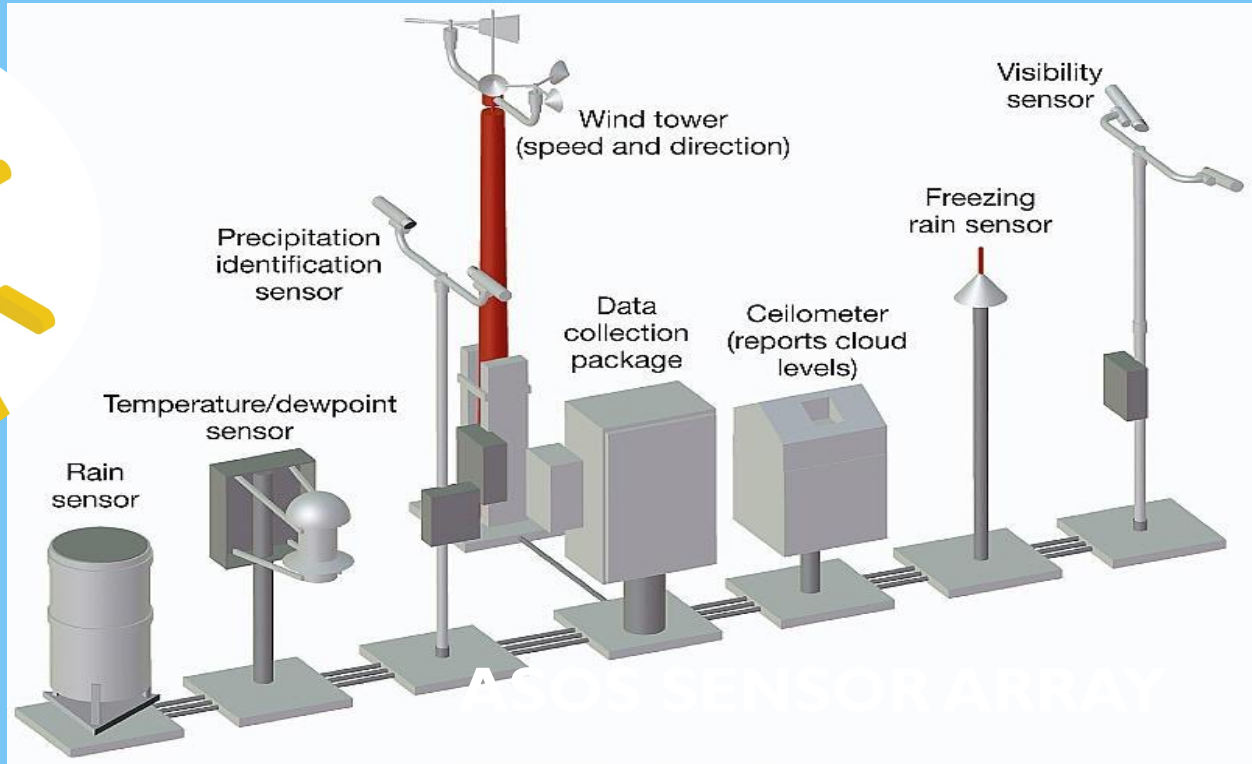




The Job of a Contract Weather Observer (CWO)

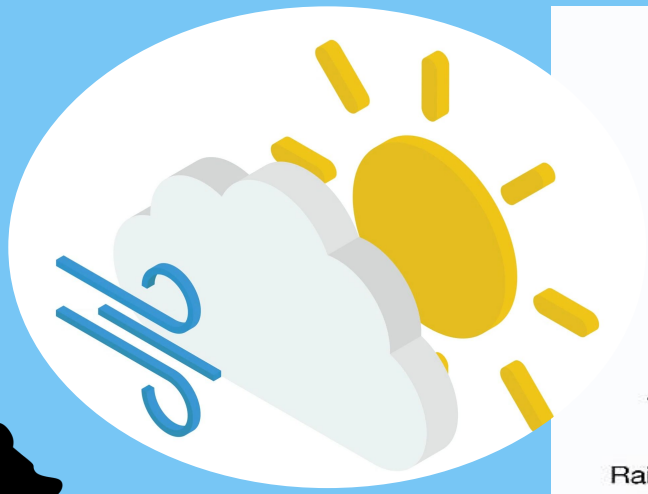
CWOs augment ASOS data with relevant weather elements and remarks.

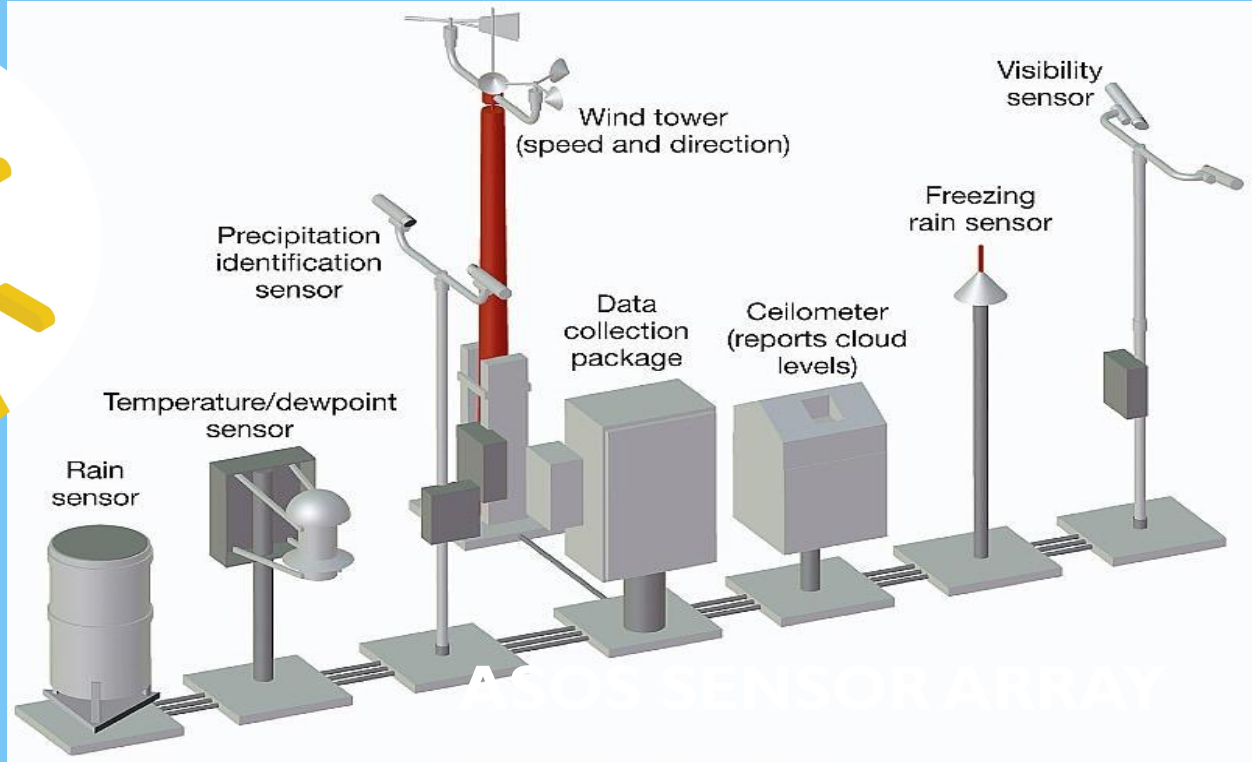




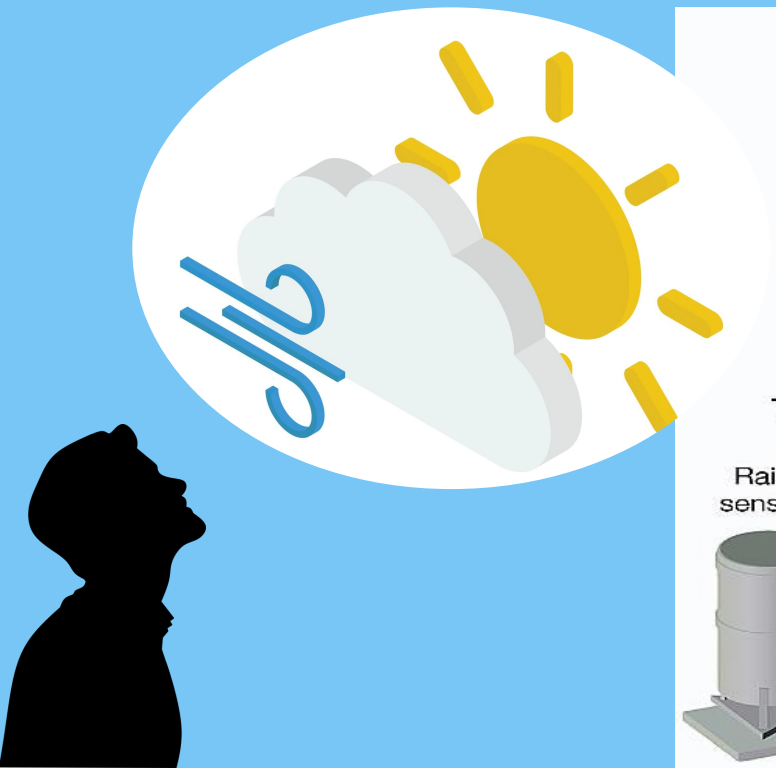
The Job of a Contract Weather Observer (CWO)

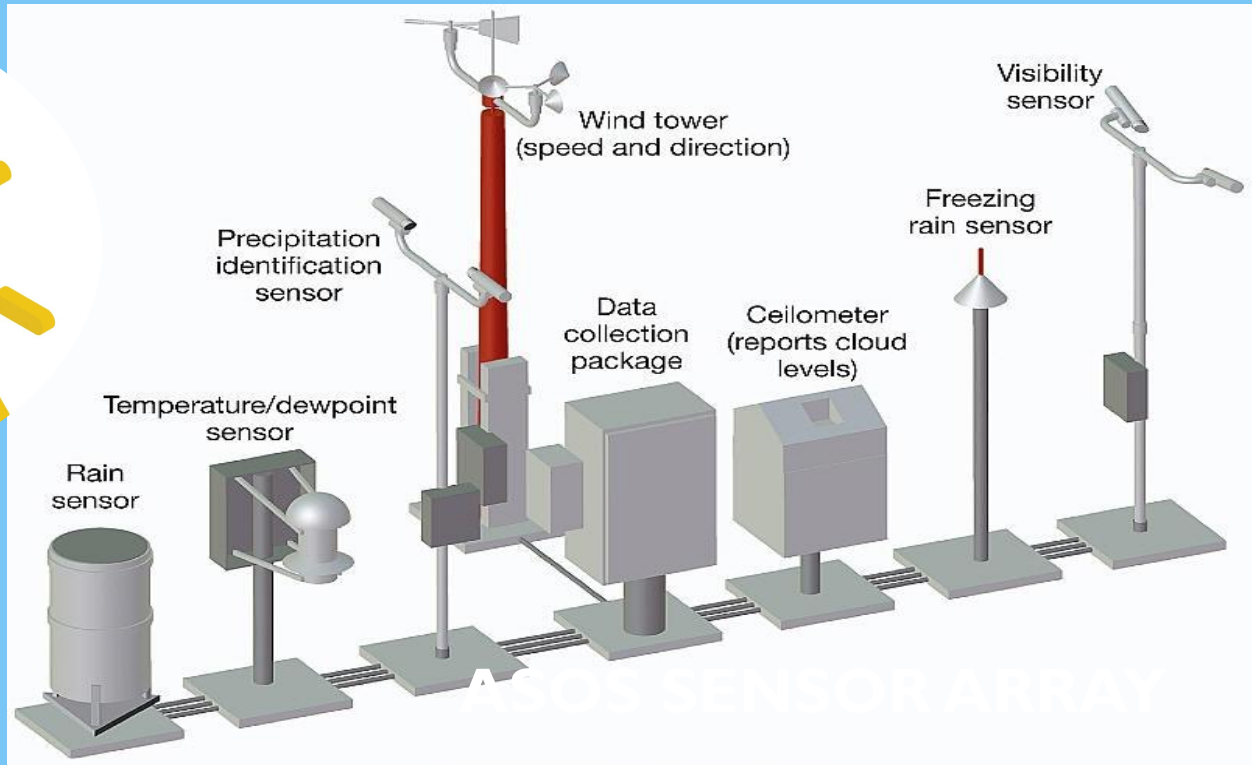
CWOs prevent the ASOS from reporting misrepresentative data.





What do the CWOs want you to know?



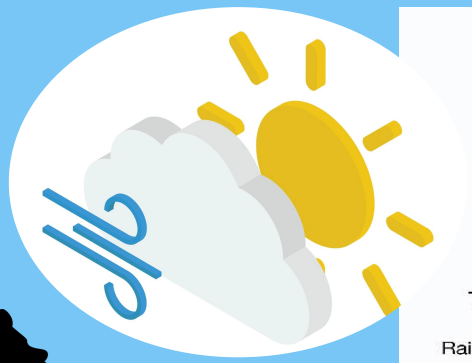


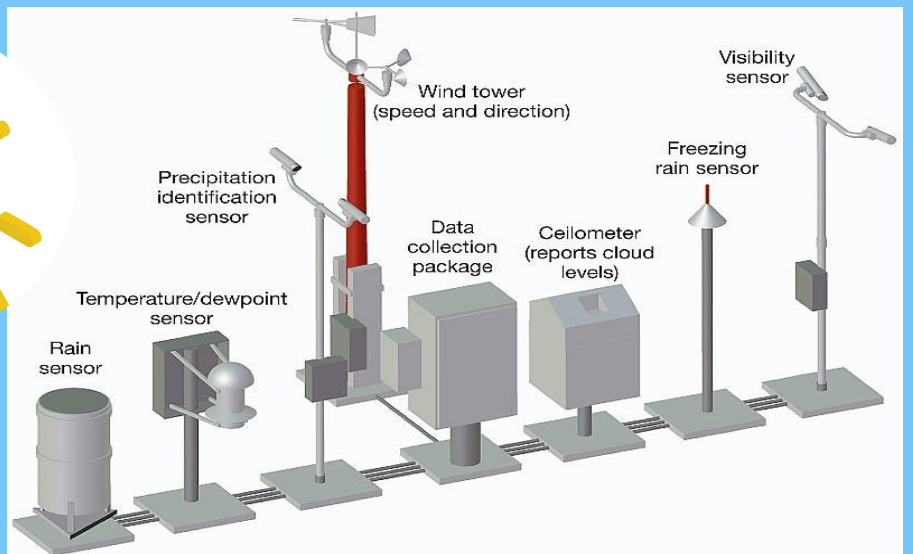
What do the CWOs want you to know?

ASOS CAPABILITIES & LIMITATIONS

PRACTICAL APPLICATIONS

CWO AUGMENTATIONS



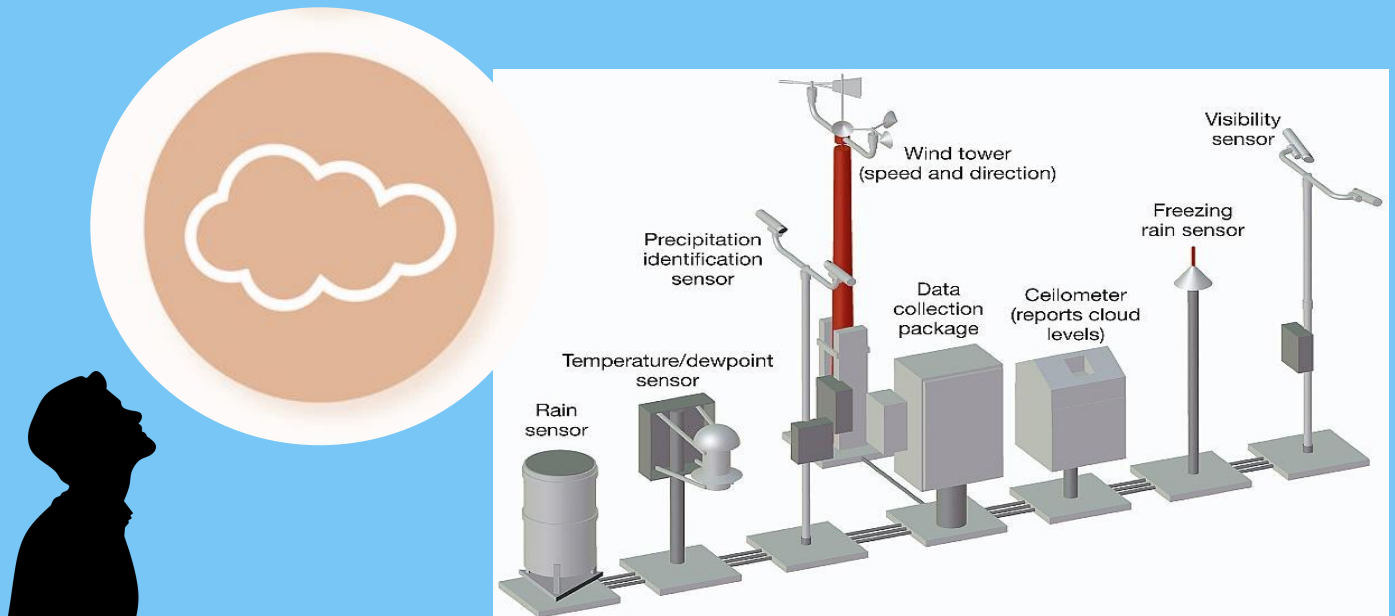


VISIBILITY

ASOS CAPABILITIES & LIMITATIONS

The ASOS provides a 10-min average of 1-min averages sampling an area less than a cubic foot.

Remarkably accurate, but highly subject to localized conditions.

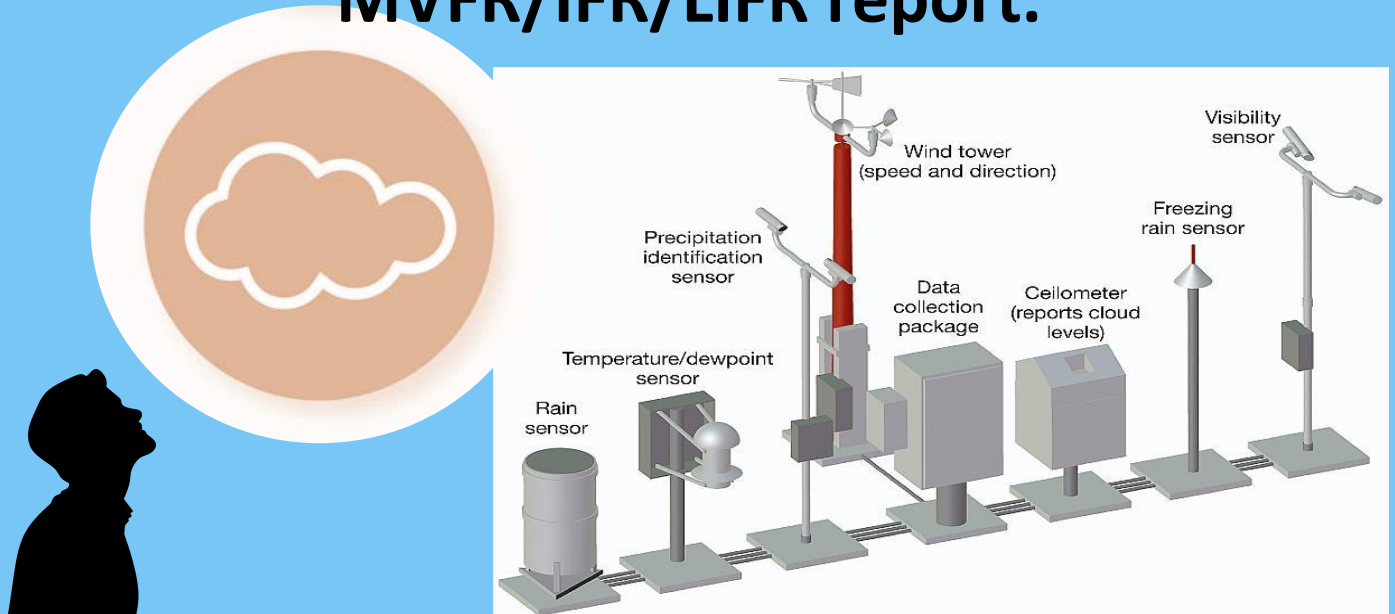


VISIBILITY

PRACTICAL APPLICATIONS

Since the VIS algorithm uses averages, the ASOS "lags" both in lowering VIS and in raising VIS.

Since the VIS measurement is localized, the ASOS can "overreact" and unnecessarily prompt a MVFR/IFR/LIFR report.



VISIBILITY

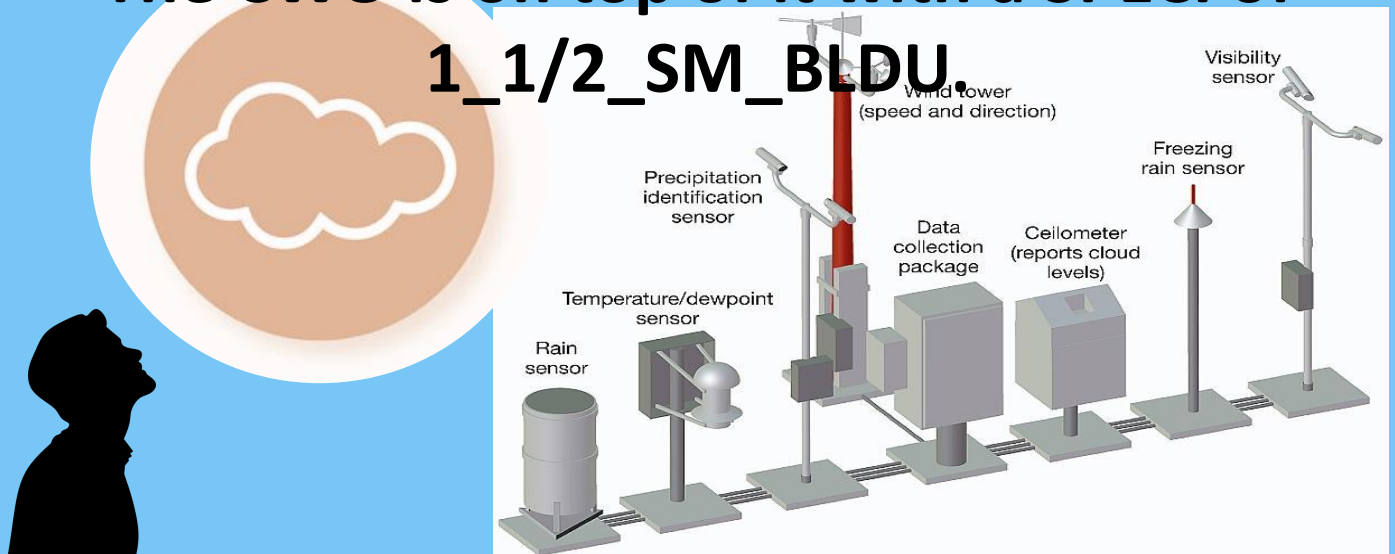
CWO AUGMENTATIONS

The CWO overcomes the "lag" of the VIS sensor.

EXAMPLE:

A wall of dust quickly drops the airfield to 1_1/2_SM. It takes the ASOS 3-5 minutes to catch up with its averages.

The CWO is on top of it with a SPECI of 1_1/2_SM_BLDU.



VISIBILITY

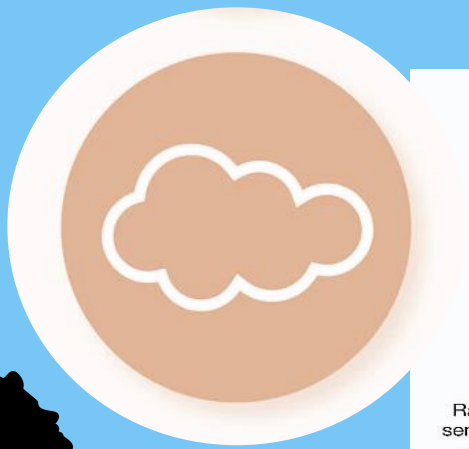
CWO AUGMENTATIONS

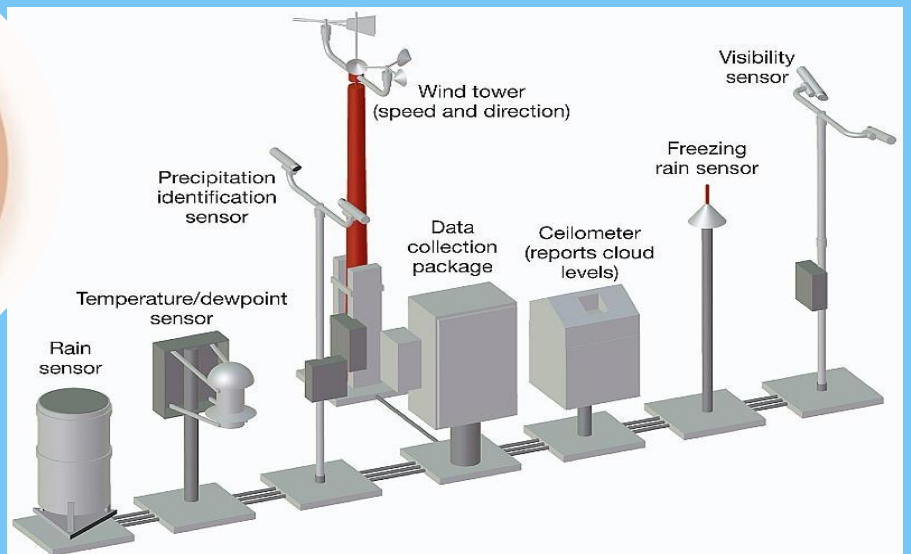
The CWO will report the "big picture" prevailing VIS.

EXAMPLE:

ASOS reports 2SM under a localized rain shaft.

CWO reports 8SM_+RA … VIS_NW-NE_2



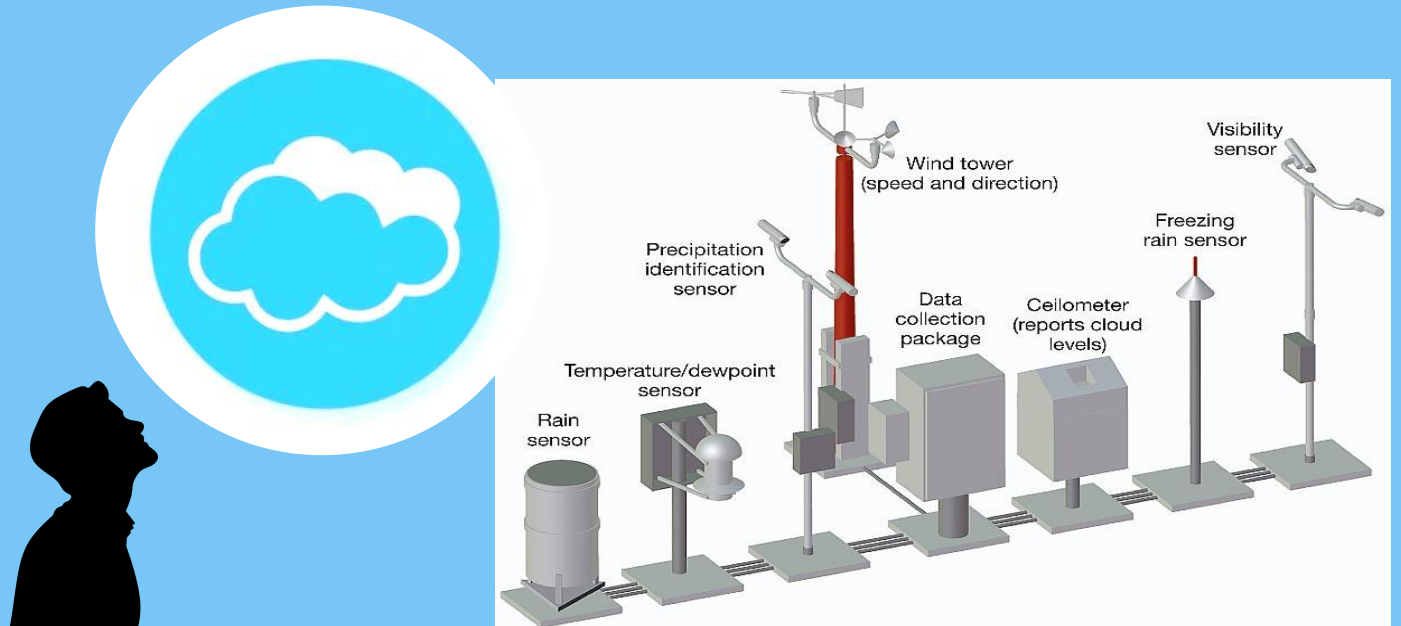


Sky Condition

ASOS CAPABILITIES & LIMITATIONS

The ASOS algorithm takes into account "hits" (layer measurements) up to 12,000 feet over a 30-min period.

The ceilometer beam is narrow with only a 60-foot width at a height of 12,000 feet.

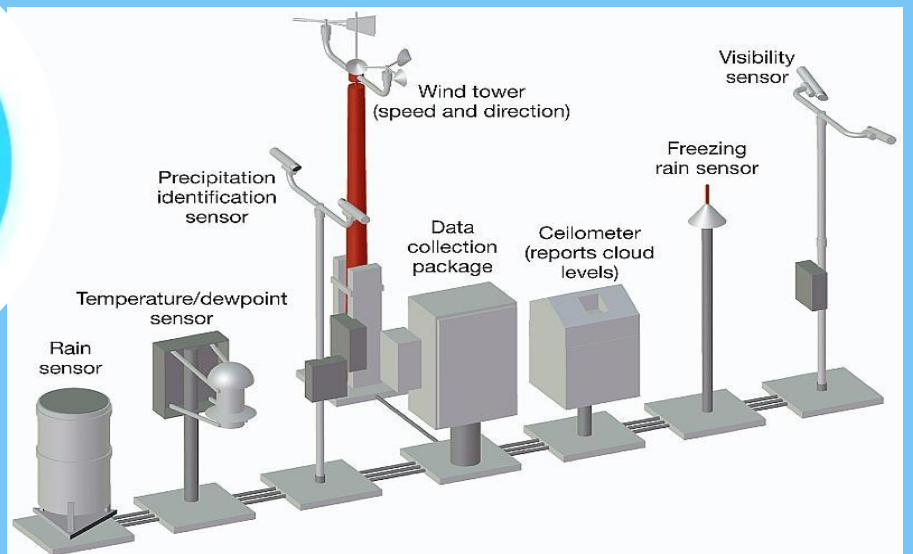


Sky Condition

PRACTICAL APPLICATIONS

The ceilometer often picks up false layers/ceilings in BLDU and in RA/SN events.

The ceilometer only picks up layers overhead. It often misses layers, and it cannot report significant cloud types.



Sky Condition

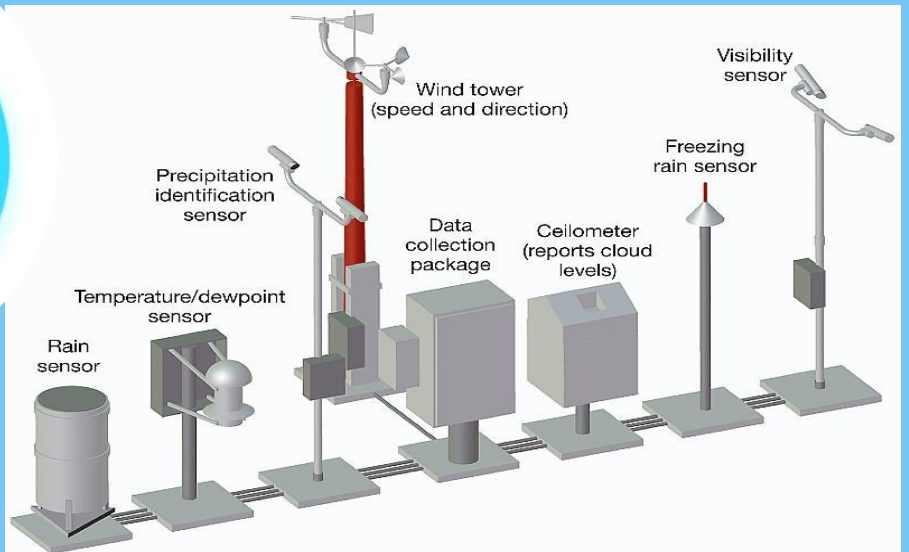
CWO AUGMENTATIONS

The CWO rightly interprets false layers for what they are.

EXAMPLE:

Ceilometer hits prompt the ASOS to generate a SPECI with 3SM_HZ_BKN027.

The CWO reports 3SM_BLDU_SCT000 … DU_SCT000.



Sky Condition

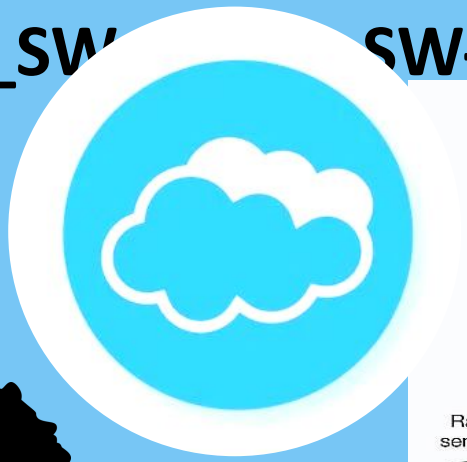
CWO AUGMENTATIONS

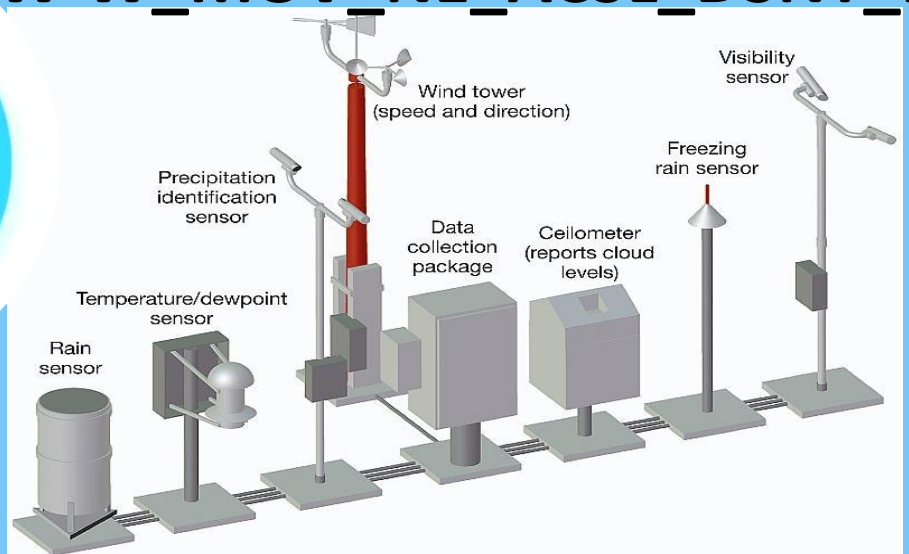
The CWO accurately reports coverage and significant clouds.

EXAMPLE:

The ceilometer is not getting any hits, so ASOS reports CLR.

The CWO sees and reports this: FEW110CB_FEW160 … VIRGA_SW SW-W_MOV_NE_ACSL_DSNT_NE-E



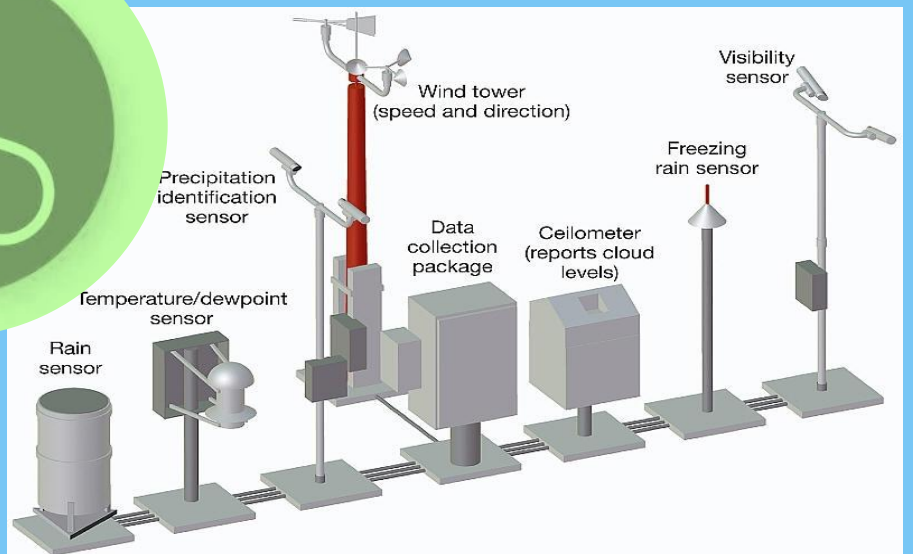


Precipitation

ASOS CAPABILITIES & LIMITATIONS

The ASOS precip sensor differentiates between rain, snow, and freezing rain, and it determines intensity.

It cannot differentiate other types of frozen precip such as hail and ice pellets, and it cannot detect drizzle.

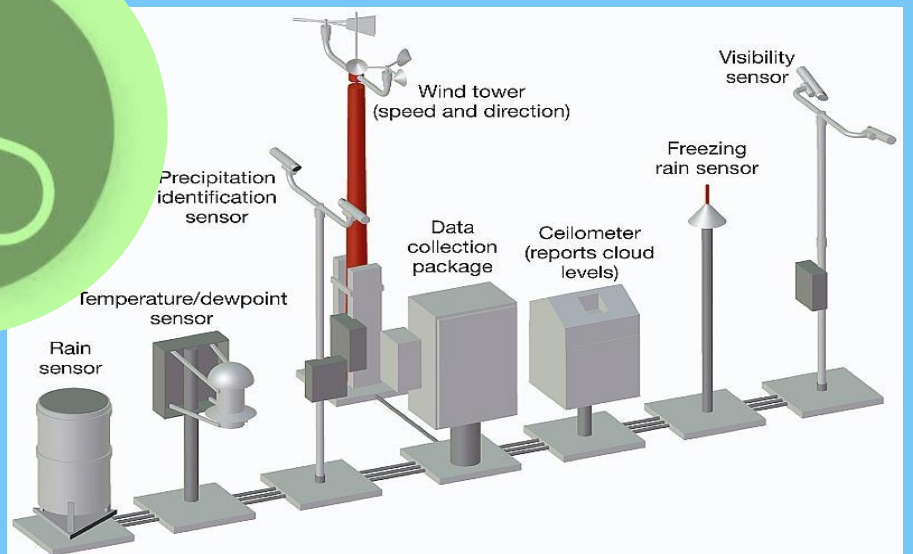


Precipitation

PRACTICAL APPLICATIONS

The ASOS reports hail and ice pellets as RA or as UP, "undetermined precipitation."

Freezing drizzle (FZDZ), a critical element for aviation, goes unreported by the ASOS or occasionally shows as -SN.



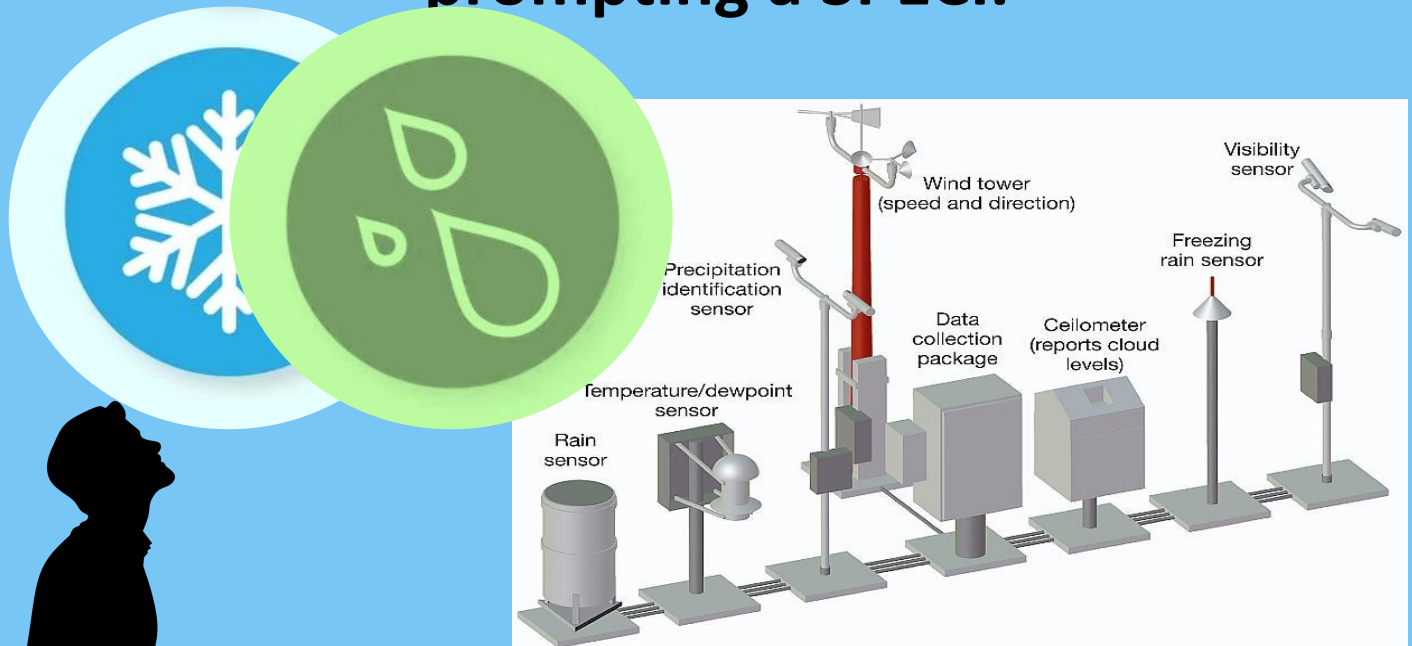
Precipitation

CWO AUGMENTATIONS

The CWO reports the occurrence of hail and its size.

EXAMPLE:

The ASOS reports +TSRA. The CWO adds hail to the present weather field, reporting +TSRAGR … GR_3/4, prompting a SPECI.



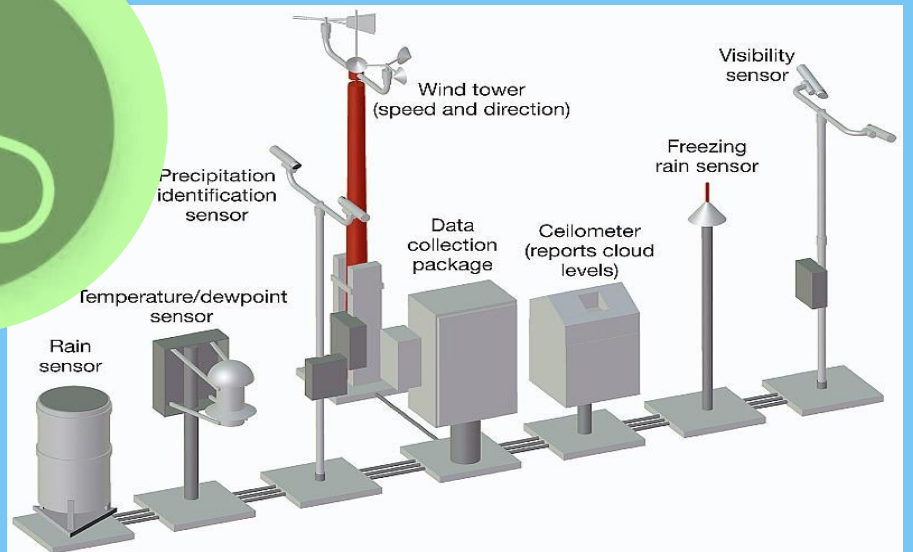
Precipitation

CWO AUGMENTATIONS

The CWO reports FZDZ alerting to the possibility of icing

EXAMPLE:

The ASOS starts reporting -SN at a temperature of M03. The CWO discerns it as freezing drizzle and reports -FZDZ, prompting a SPECI.

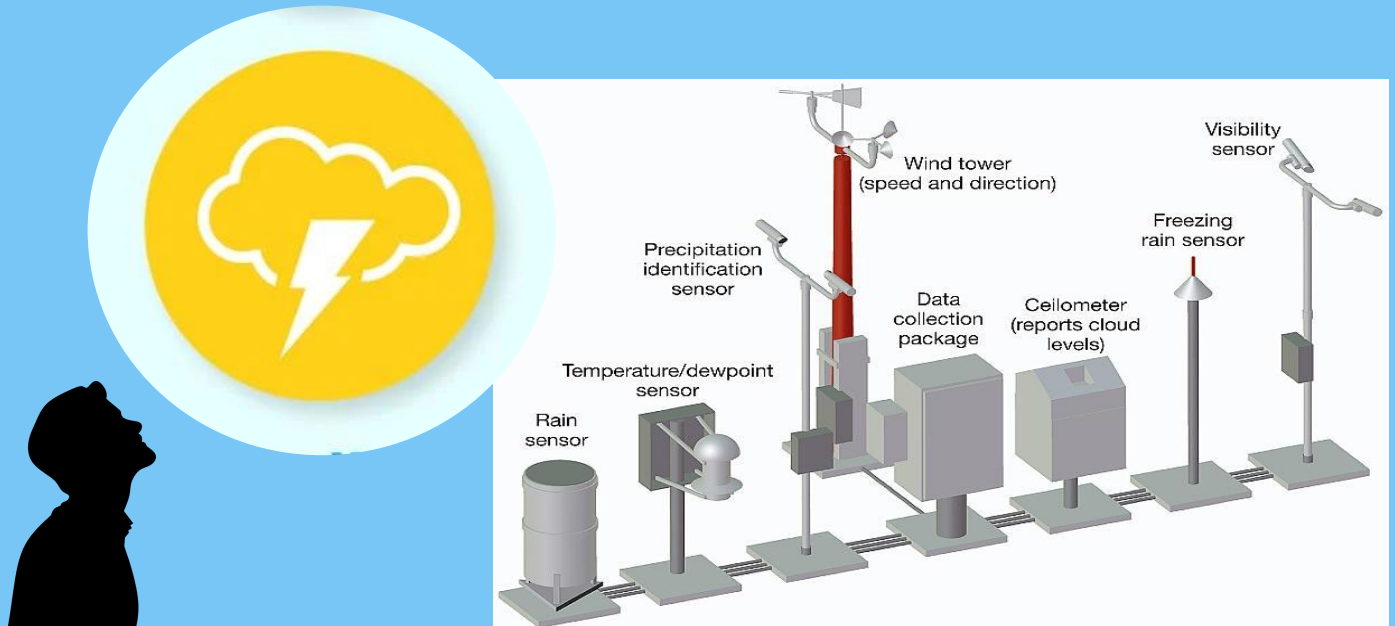


LIGHTNING & TS

ASOS CAPABILITIES & LIMITATIONS

The ASOS utilizes the ALDARS lightning detection system which reports lightning up to 30 nautical miles away.

ALDARS only detects cloud-to-ground lightning. ALDARS does not report lightning frequency or type.

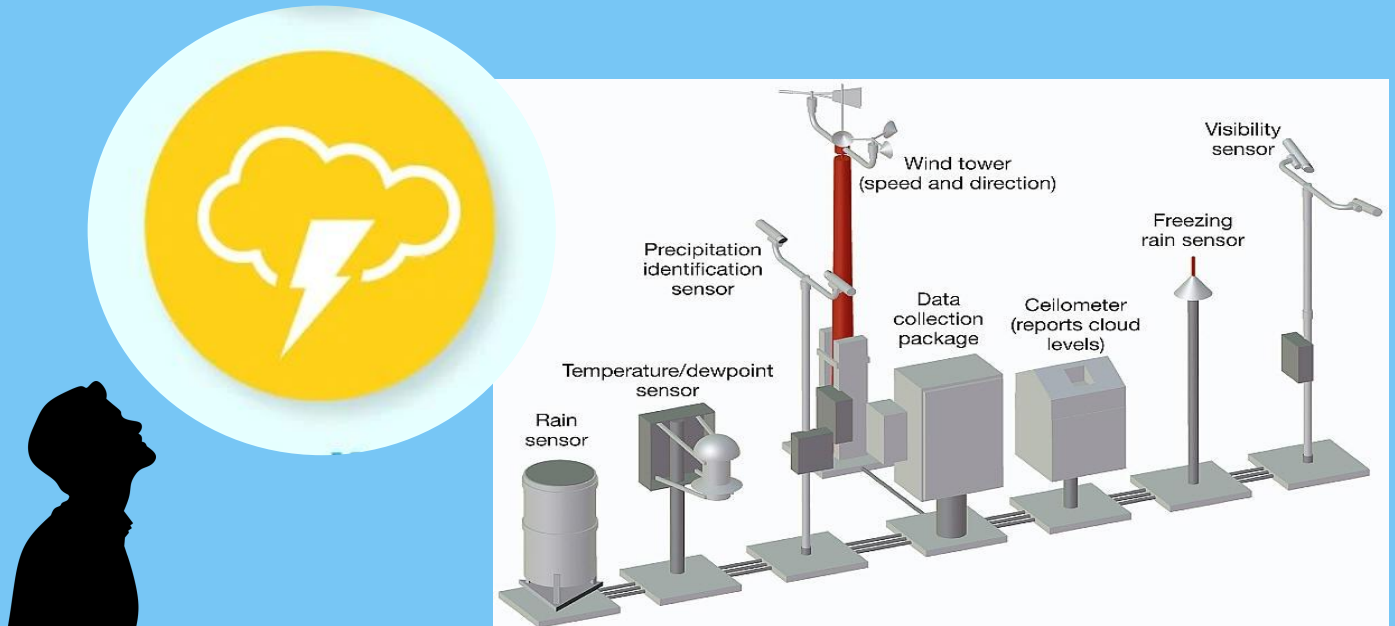


LIGHTNING & TS

PRACTICAL APPLICATIONS

The ASOS reports LTG beyond 10SM as DSNT LTG, LTG between 5-10SM as VCTS, and LTG within 5SM as TS.

Since ALDARS only picks up cloud-to-ground lightning, some thunderstorms can go unreported.



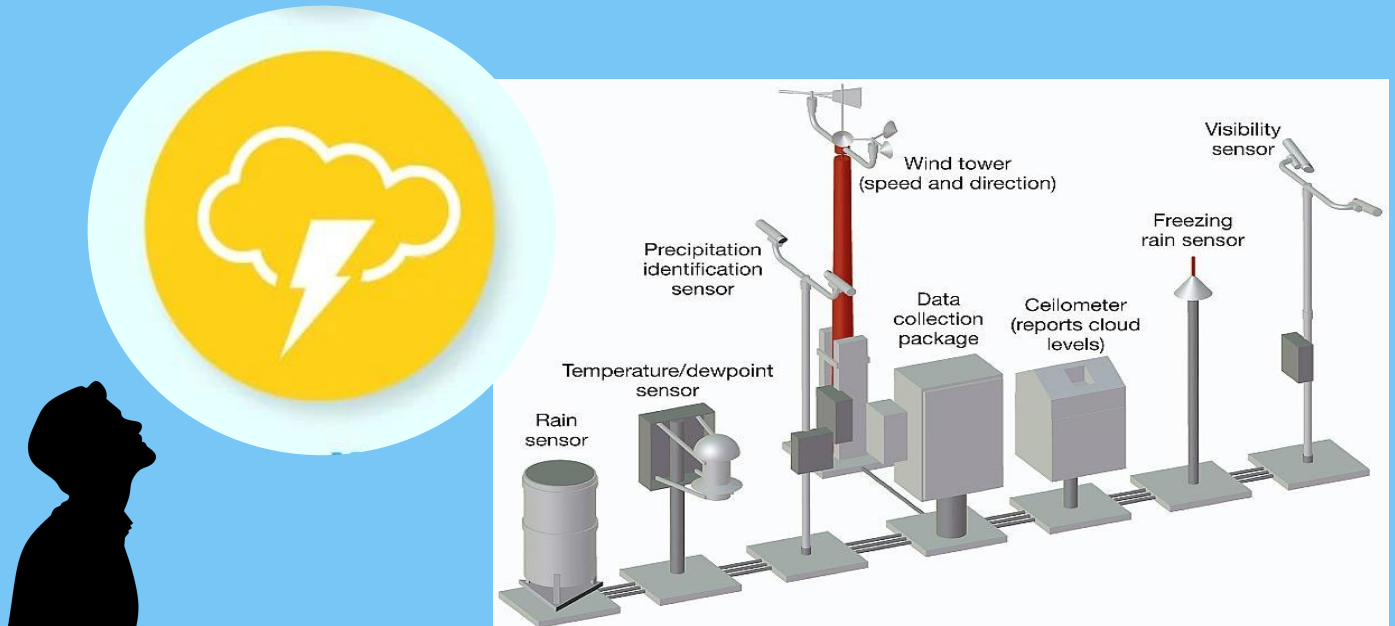
LIGHTNING & TS

CWO AUGMENTATIONS

The CWO reports LTG frequency and type.

EXAMPLE:

The ASOS reports LTG DSNT W-N. The CWO reports FRQ_LTGICCCCG_DSNT_W-N_CB_DSNT_W-N_MOV_SE.



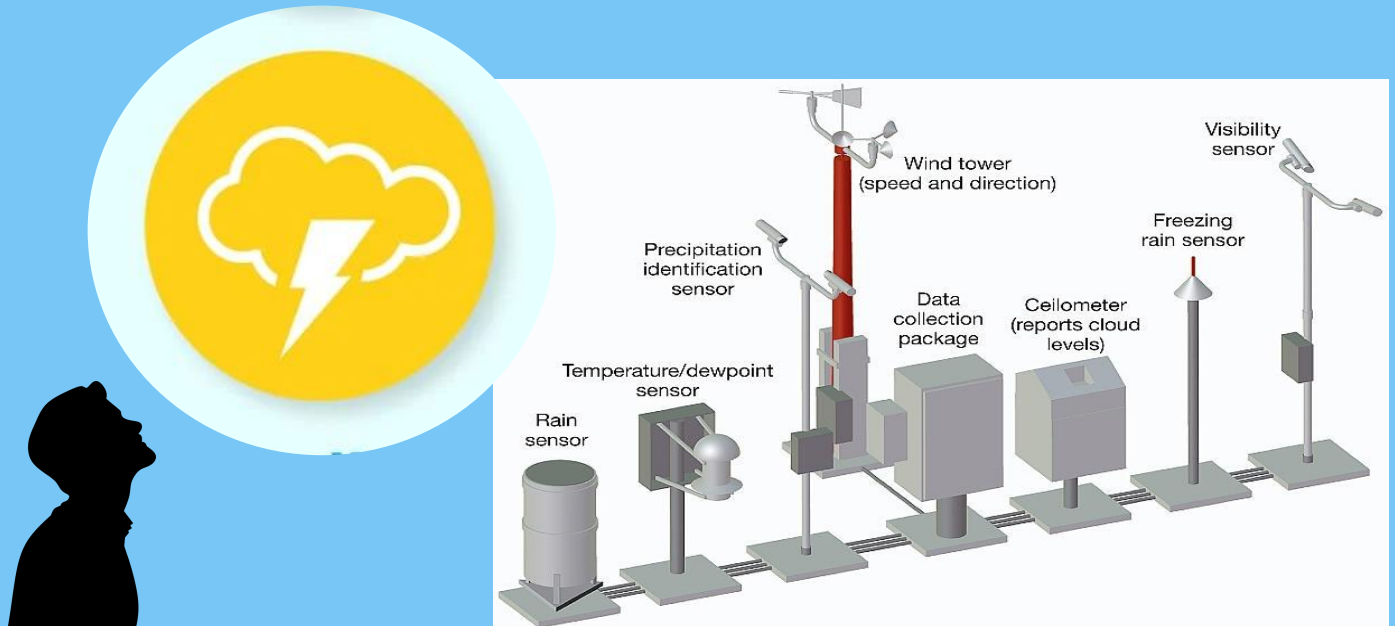
LIGHTNING & TS

CWO AUGMENTATIONS

The CWO appropriately reports LTG in the vicinity as a TS

EXAMPLE:

The ALDARS does not detect nearby in-cloud LTG. The ASOS could well be reporting CLR. The CWO reports TS_FEW080CB … OCNL_LTGIC_E_TS_E_MOV_LTL.

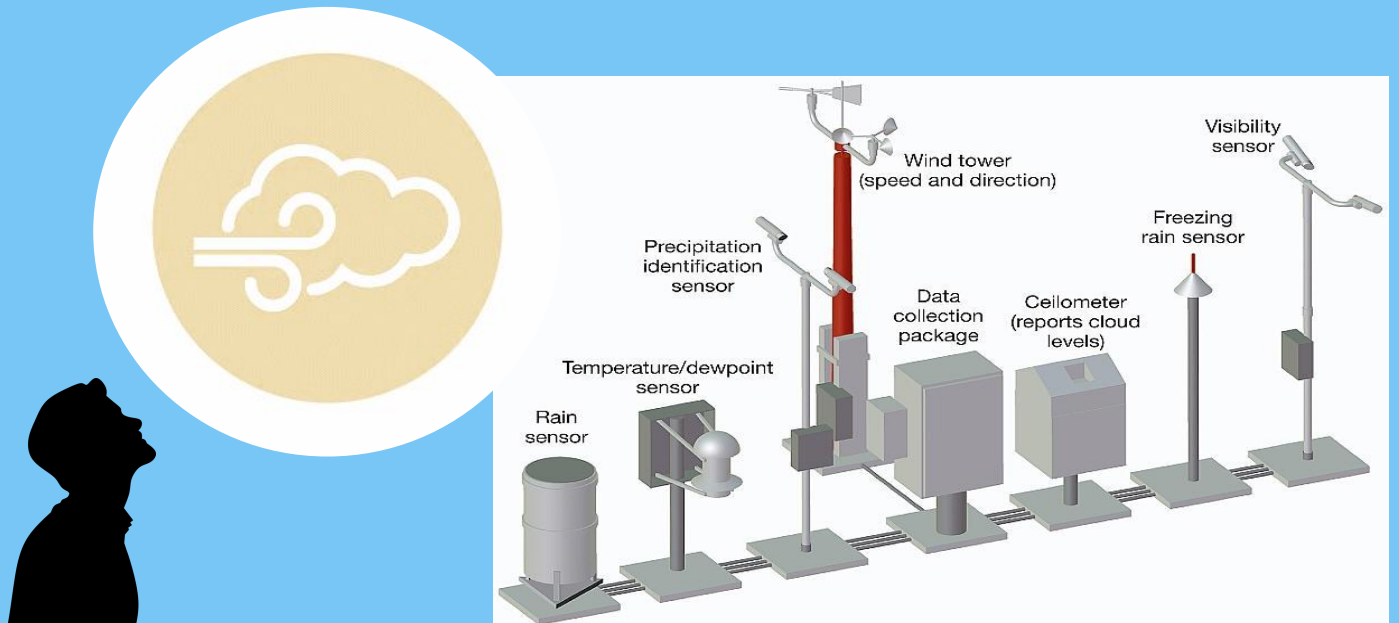


Wind

ASOS CAPABILITIES & LIMITATIONS

ASOS reports a 2-minute average of 5-second average wind speed/directions once a minute.

The current ASOS wind algorithm leads to NUMEROUS wind outages.

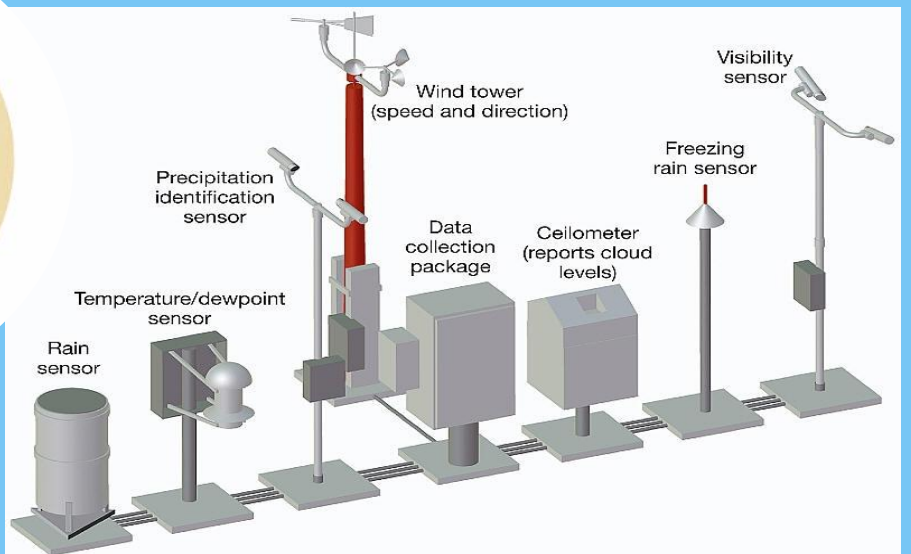


Wind

PRACTICAL APPLICATIONS

Since the wind algorithm uses averages, the ASOS must wait a full 15 minutes to verify and report a wind shift.

The many wind outages can lead to METARs/SPECIs without wind data at non-augmented sites.



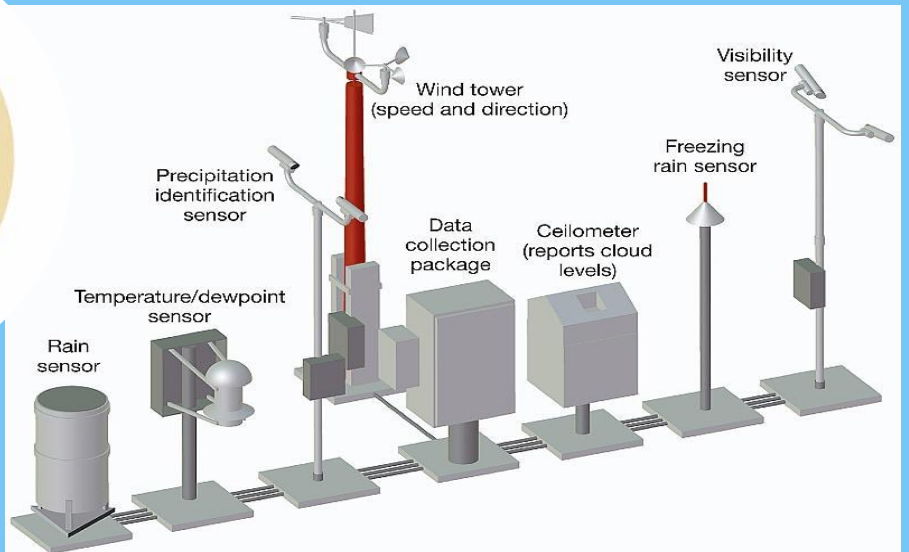
WIND

CWO AUGMENTATIONS

The CWO can report a WSHFT soon after it occurs.

EXAMPLE:

The ASOS reports a WSHFT that occurred at 2218 at 2233. The CWO, knowing the forecast and associated WSHFT clues issues the 2218 WSHFT SPECI at 2223.



Wind

CWO AUGMENTATIONS

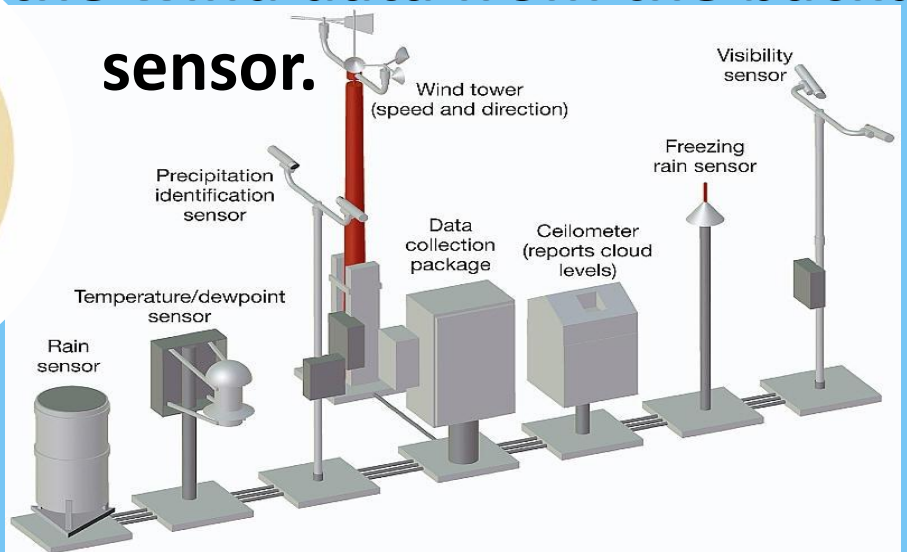
The CWO prevents reports from going out without wind data.

EXAMPLE:

The ASOS wind sensor goes out 2 minutes before the METAR.

An automated report would have no wind data!

The CWO uses the wind data from the backup sensor.



What do CWOs want you to know?

FINAL THOUGHTS

METARs & SPECIs – a snapshot in time.

CWOs are here to serve you and to help enhance aviation safety!

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