DATA REQUEST RESPONSE
Bear Valley Electric Service (BVES)

Request Date:	June 27, 2023
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Title:	President & Treasurer
Response Date:	June 30, 2023
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Data Request No:	OEIS-P-WMP_2023-BVES-002
Subject:	Q01. Weather Station Standards Q02. Future Weather Stations and Cameras Q03. Fuel Moisture Sampling Q04. Situational Awareness Initiative Targets by Year Q05. Fire Potential Index (FPI) Q06. Detailed Vegetation Inspections Q07. Migration to iRestore Q08. Risk Modeling In-House Capability Q09. Independent Review Process Q010. Risk Categorization and Mitigation Strategy

DATA REQUEST

Q01. Regarding Weather Station Standards:

a. BVES states that they have 20 weather stations in their network and provided the date of installation and locations.

i. Provide product vendor, the installation and equipment standard that all BVES weather stations are installed to, including height from ground, direction of cross- arm, and which side of the pole/tower they are installed on.

ii. Provide the total number of stations that were serviced annually over the past 3 years, and the maintenance preformed on each station.

iii. Provide the total number of stations not serviced annually over the past 3 years.

iv. Provide the estimated life span of each sensor and the replacement cycle for each.

v. Provide the total number of repair requests initiated, per year, over the past 3 years. Include the time duration from initiation to completion of repair.

vi. Provide the number of times per day BVES is collecting weather data for use in its decision-making processes and situational awareness.

Response:

i. Weather Station equipment and software is provided by Columbia Weather Stations. The weather data is also tracked on weather.gov. Weather Stations are mounted on poles between the power and the communications lines. The exact height will vary depending on the height and configuration of the pole. Direction of the cross-arm will vary depending on the pole location; however, the direction is not critical since weather data can be collected from any angle. Refer to Excel spreadsheet “BVES Weather Station Locations” for information on pole locations.

ii. Weather stations are inspected annually and maintenance is performed, if necessary. Since installation, 7 weather station have required maintenance.

iii. All weather stations are inspected annually. 13 weather stations have not required maintenance since installed.

iv. The weather sensors have a life span of approximately 2 years. BVES is developing a formalized annual inspection and maintenance plan for the weather stations which will includes scheduled replacement of sensors.

v. Since the weather stations have been installed, three weather stations have been sent back to the factory for repairs. A typical repair time is one month. BVES carries a spare weather assembly and spare weather station parts.

vi. The weather information from each weather station is collected and recorded every few seconds. Technosylva will be downloading the weather information from weather.gov to incorporate the information into its weather model predictions which are updated 8 times per day.

Q02. Regarding Future Weather Stations and Cameras:

a. BVES states in section 8.3.2.3 pg 194 that, "BVES will continue to work in partnership with Technosylva, UCSD, CAL FIRE, and Big Bear Fire department to determine if additional cameras or weather stations would be beneficial in providing granularity to the conditions within BVES's service territory".
   i. Provide the methodology utilized to evaluate the need, placement, and number of additional weather stations and cameras for the service area.
   ii. Does BVES utilize any of weather stations operated/owned by the NWS, CAL FIRE, USFS, SCE, or any other entity?
      (1) If so, which ones. If not, explain the justification for not including them in BVES decision making process.

Response:

i. Cameras: The methodology used is by having annual communications with these organizations (UCSD, CAL FIRE, and Big Bear Fire Department) on the necessity of additional cameras.

Weather Stations: The methodology used is by having annual communications with the BVES weather consultant and Technosylva on the necessity of additional cameras.

ii. BVES's weather consultant and Technosylva use open source weather stations accessible through the NOAA/NWS network in addition to BVES's weather stations. Some of the specific weather stations used, in addition to BVES weather stations, include:

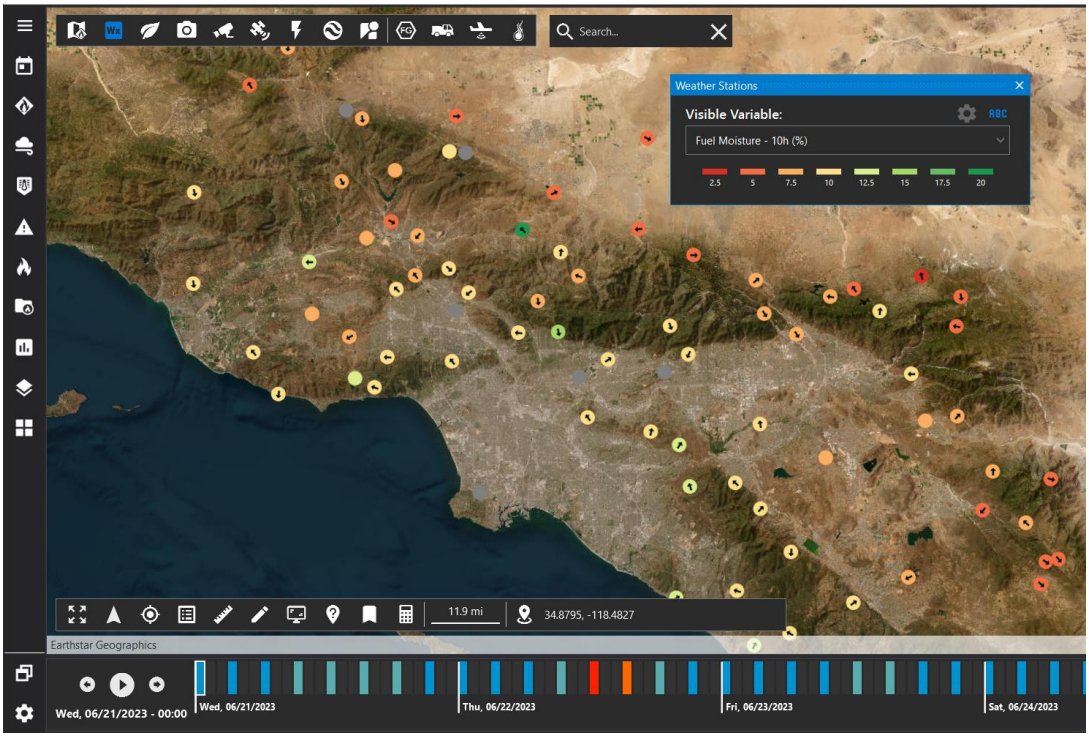
- FAWNSKIN, CA (RAWS - SGX) Elev: 6900 ft; Lat/Lon: 34.266110/-116.898890
- Big Bear City Airport, CA (ASOS/AWOS - SGX) Elev: 6752 ft; Lat/Lon: 34.26380/-116.85600
- CONVERSE, CA (RAWS - SGX) Elev: 5618 ft; Lat/Lon: 34.194170/-116.913060
- HEAPS PEAK, CA (RAWS - SGX) Elev: 6455 ft; Lat/Lon: 34.234830/-117.138880
- ROCK CAMP, CA (RAWS - SGX) Elev: 4923 ft; Lat/Lon: 34.290580/-117.2135
- BURNS CANYON, CA (RAWS - SGX) Elev: 6284 ft; Lat/Lon: 34.208420/-116.621610
- BIG PINE FLAT, CA (RAWS - SGX) Elev: 6851 ft; Lat/Lon: 34.318750/-117.013890
- MILL CREEK (BDF), CA (RAWS - SGX) Elev: 2950 ft; Lat/Lon: 34.079840/-117.046760

Q03. Regarding Fuel Moisture Sampling

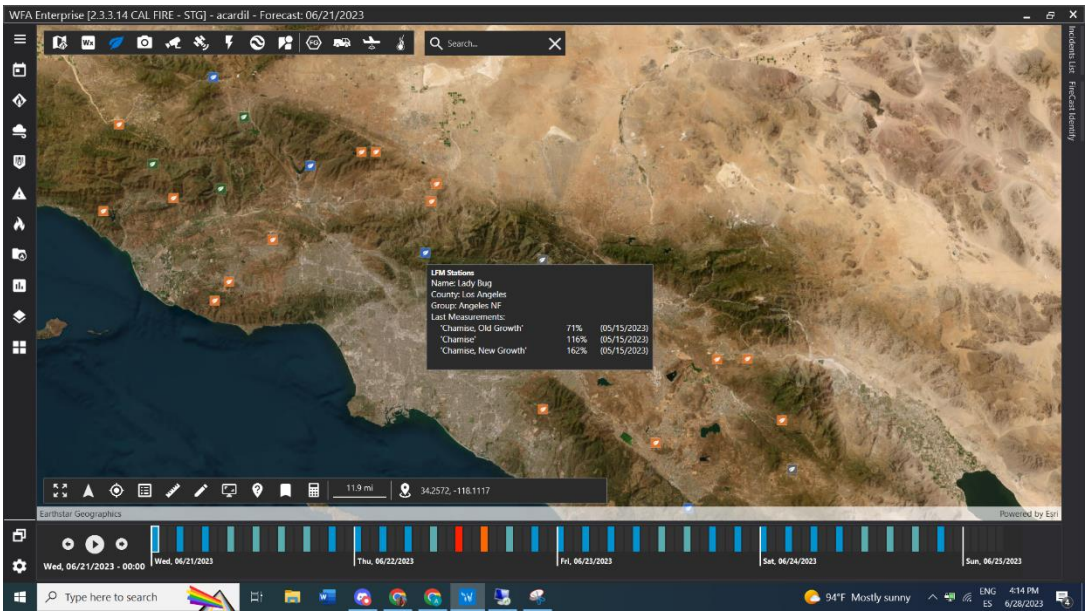
a. BVES states in section 6.1.1 pg 42 that they utilize both live and dead fuel moisture as part of the risk analysis model.
   i. Provide a map of BVES Live Fuel Moisture (LFM) and Dead Fuel Moisture (DFM) sampling sites, including any sites utilized that are being collected by other entities.
   ii. Provide a listing of the vegetation types BVES samples at each location and number of times per month BVES takes vegetation samples.
      (1) If BVES does not currently collect LFM or DFM samples, will it begin this data collection process in the future?

Response:

i. Technosylva provides the DFM and LFM information. For DFM: The Technolsylva WFA-e model utilizes the Nelson (2000) model to calculate DFM hourly based on weather data. WFA-e also shows 10h-DFM from RAWS weather stations. This data is currently used to validate modeled DFM. It can be used in on-demand simulations when a fire occurs. DFM sampling locations are shown below:



For LFM: The Technosylvia WFA-e model utilizes a Technosylva's LFM model trained with field samples from the WFAS national dataset (Wildland Fire Assessment System). This dataset usually gets LFM from main shrub species bi-weekly. More info and data: https://www.wfas.net/index.php/national-fuel-moisture-database-moisture-drought-103. LFM sampling locations are shown below:



ii. BVES does not collect vegetation samples. BVES does not plan on collecting any vegetation samples in the future. DFM and LFM information is provided by Technolsylva as part of wildfire modeling.

Q04. Situational Awareness Initiative Targets by Year

a. In table 8-29 pg 190, BVES shows a target goal of 100% for several initiative activities that have ongoing monitoring and maintenance (FPI, Weather Forecasting, Environmental Monitoring).
   i. Provide what the metric of 100% represents in the targets table and what specific measures are used to track, quantify, and achieve progress towards those targets?

Response:
BVES believes this question is referring to Table 8-23 Situational Awareness Initiative Targets by Year on pages 235-236. The 100% target represents achieving 100% of the intended annual scope of work for each specific year. For example, the “Weather Forecasting” (SAF_5) includes receiving a daily update from Technosylva and a weekly update from the weather consultant. Anything short of those requirements would result in the actual achievement being less than the target. In the case of “Environmental monitoring systems /Advanced Weather Monitoring and Weather Stations” (SAF_1), 100% refers to the weather station coverage provided by the BVES weather stations was sufficient to support satisfactory weather monitoring in the service area.

Q05. Fire Potential Index (FPI)

a. In table 8-27 pg 188, BVES states that it will develop and implement an FPI utilizing Technosylva by 31 December 2023.
   i. Provide the method and matrix that is being utilized to formulate the current daily FPI for the service area.

Response:
Currently BVES utilizes the National Fire Danger Rating System (NFDRS) to evaluate the fire potential in its services area (SC-10 is the applicable NFDRS zone for BVES).

Refer to "NFDRS 1" and "NFDRS 2" for description and example output.

The table below provides the operations actions in response to the NFDRS forecast:

Operational Action	Green	Yellow	Brown	Orange	Red
Circuit Recloser Settings	Automatic Reclosing	Automatic Reclosing	Non-Automatic Reclosing	Non-Automatic Reclosing	Non-Automatic Reclosing
Patrol following circuit outage	No[1]	No[1]	Yes	Yes	Yes
TripSavers	Automatic	Automatic	Non-Automatic	Non-Automatic	Non-Automatic
Proactive De-energization (PDE)	No	No	No	Yes – "at risk" lines when wind gusts greater than 55 mph	

[1]No patrol is required. Re-test allowed following check of fault indicators, SCADA, other system indicators, and reports from the field. If the re-test fails, a patrol is mandatory.

Q06. Detailed Vegetation Inspections

a. On page 202 of its 2023-2025 WMP, BVES stats that it conducts its Detailed Vegetation Inspections (VM_1) "at least once every five years;" but on page 210, BVES states that it has a "3-year vegetation management program cycle." Clarify whether BVES Detailed Vegetation Inspections (VM_1) occur on a 5- or 3-year cycle.
b. During Detailed Vegetation Inspections, does BVES perform Level 2 (360-degree) inspections of trees with strike potential?
   i. If so, what triggers a Level 2 inspection?
   ii. If not, why does BVES not perform Level 2 inspections?

Response:
BVES conducts Detailed Inspections on a five year cycle in compliance with G.O. 165. Detailed Inspection is just one of many inspections that BVES conducts to ensure proper clearances around power lines. The Detailed Inspection is conducted by a BVES field inspector which is a journeyman lineman. The field inspector works

closely with the contracted forester on any tree that maybe of concern. The contracted forester then completes a level 2 inspection on the tree in question. Level 2 inspections are initiated by trees identified by the field inspector that are dead, rotten or diseased or dead, rotten or diseased portions of otherwise healthy trees which overhang or lean toward and may fall into a span of power lines.

The “3-year vegetation management program cycle” refers to the overall clearing activities conducted around BVES facilities. The entire system is cleared on a 3-year cycle. Some areas are visited more frequently based on growth rates and inspection findings.

Q07. Migration to iRestore

On page 215, under “Planned Next Steps,” BVES states "Migration to iRestore (cloud- based) software Oct. 2022;" in the same page. BVES states “this database is expected to be fully up and running by the end of 2023.” These statements seem contradictory.

a. Clarify these statements and confirm when BVES plans to complete the migration to iRestore.

Response:
iRestore has many different programs within the database for example GO-165 inspections, tree inventory system, and substation inspections. All of these different programs have different timelines for coming online. BVES migrated to iRestore for GO-165 inspections in 2022. BVES migrated to the tree inventory application in early 2023 and plans to have the substation inspection application online in 2023 as well.

Q08. Risk Modeling In-House Capability

a. Regarding your response to section 6.1.1, can you explain what part of your risk modeling capabilities will be “in-house”, as in BVES team members, which will be partially delegated to Technosylva, and which will be fully delegated to Technosylva? What we would like to understand is the risk modeling functions that will remain within BVES and how model maturity improvements and the development of in-house capabilities will look like once the Technosylva model is fully implemented.
    i. Besides Technosylva, what other risk modeling platforms or tools do you expect to use for wildfire risk modeling (operational and planning) once Technosylva is fully implemented?
    ii. How, if at all, will you continue to use the vendor REAX in your wildfire risk modeling once you have fully implemented the Technosylva model?

Response:
This is an evolving process. BVES is currently in communication with Direxyon to develop asset based models base on BVES's deployed assets, BVES outage records, and industry failure rates, utilize BVES consequence weights (see below), and leverage the Technosylva ignition and fire risk models. The overall idea is to combine probability of ignition (Technosylva model), probability of asset failure (Direxyon model), and condition modifiers (BVES input to Direxyon) to develop ignition probability. On the consequence side, BVES will be working with Direxyon to use its consequence weights (see below) and Technosylva impact indexes (Fire Behavior Index, Population Impacted, Buildings Impacted, Fire Area, etc.).

Direxyon will develop the overall model. The model will basically combine (take the product of) probability of ignition, probability of asset failure, consequence modifiers (BVES weights) and consequence of fire.

BVES consequence (impact) weights:

Reliability	Compliance	Quality of Service	Safety	Environmental
12.1%	17.1%	7.2%	60.5%	3.1%

BVES would also work with its contractor to identify risk of vulnerable populations (Medical Baseline, Access and Functional Needs) and area based on BVES customer demographics being input to the Direxyon model.

BVES will continue to use the Risk-Based Decision-Making Framework (BVES Risk Register Model) as is required CPUC Decision D.19-04-020 of April 25, 2019. As described in the WMP, this is a Subject Matter Expert based model.

Currently, BVES is not engaging REAX engineering. The CPUC is reviewing the update periodicity of the fire maps that determine the HFTD areas and tiers. BVES would likely engage REAX engineering in performing a review of its service area to determine if the HFTD boundaries warrant change. Such a review would not occur in 2023 but could occur in 2024 or 2025.

Q09. Independent Review Process

a. What do you expect your independent review process for your wildfire risk modeling and data used by your models will look like once you have fully implemented Technosylva's wildfire model?
   i. Is there a third party involved in this process; not Technosylva and not BVES?

Response:
BVES is sourcing an entity to perform an independent review. Potential independent reviews could be performed by Direxyon or Guidehouse. The desired deliverables for the independent review would be:

- Confidence levels for wildfire, ignition, and PSPS risk, likelihood of occurring and consequence (fire size potential, population impacted, buildings impacted, etc.).
- Evaluation of the quality of data sources (accuracies, age and refresh rate).
- Evaluation of the application version and update control.
- Evaluation of update testing and implementation protocols.
- Vulnerability of the application to cyber security issues.

Q010. Risk Categorization and Mitigation Strategy

a. Regarding risk-impact categorization, can you provide an example assignment of severity levels and impact values as they are used in your risk-impact categorization?
b. Please elaborate on how BVES evaluates benefits and drawbacks of each mitigation strategy at different scales of application.

Response:

BVES uses the following impact characterization in its Risk-Based Decision-Making Framework (BVES Risk Register Model) as is required by CPUC Decision D.19-04-020 of April 25, 2019.

Reliability	Compliance	Quality of Service	Safety	Environmental
12.1%	17.1%	7.2%	60.5%	3.1%

The Technosylva WFA-E looks at Fire Behavior Index, Fire Size Potential, Buildings Impacted, Population Impacted, Rate of Speed, and Flame Length.

Currently, BVES uses a straight line (mitigation risk reduction achieved is directly proportional to mitigation percent completed or implemented) to evaluate benefits and drawbacks of each mitigation strategy at different scales of application. This will change with the implementation of Direxyon's applications to provide more weight in risk reduction to specific assets contribution to the risk when the mitigation is applied to the specific assets and the risk calculation includes each individual asset condition.

For example, installing covered conductors has a larger risk reduction impact when installed on certain specific poles in higher risk areas that it does in areas of lower risk. The asset model will be granular enough to be able to differentiate specific poles, transformers, etc.

END OF REQUEST