

WILDFIRE DATA:

WHAT TO KNOW ABOUT HISTORICAL WILDFIRE IN NORTH CENTRAL REGION

DEVELOPING NEXT GENERATION FIRE SYSTEM...

SCIENCE

HIGH CADENCE OF DATA COMING TO YOU IN FASTER INTERVALS & MORE PIXELS

EVENT-BASED ALERTS

GEODATA LAYERS

REAL-TIME FIRE COVERAGE

SUPPORTING ACTIVE RESPONDERS

SATELLITE IMAGERY... BUT RELYING ON DECADES OLD REQUIREMENTS

IMAGERY CAN BE SEEN THRU CLOUDS AND THICK SMOKE

SURGING FIRES WILL ALWAYS BE EASIER TO

DETECT

DO NOT PLAN ALONE, USE A DATABASE

MANY FIRE FEATURES FROM THE CONTROLLED TO THE WILDFIRE BURNS!



• CONFIGURE ALERTS FOR YOUR AREA

• SATELLITE VIEWER FOR YOUR ALERT

• REVIEW FIRE PHOTOS

STILL EXPERIMENTAL @ NOAA

• INTENSITY

• TIME SERIES

• HISTORY OF FIRE

• CONTEXT OF FIRE EVOLUTION

KNOW THE TRENDS & DRIVERS OF CHANGE IN WILDFIRE RISK

KNOWING HOW MUCH A STRATEGY COSTS FROM USING CLIMATE READI

POLICY

CLIMATE READI

INFORM OUR INVESTMENTS

• STUDIES
• PROACTIVE WAS BETTER THAN STATUS QUO

FRAMEWORK

CLIMATE INFORMED



• COMPONENTS
• HAZARDS
• 100+ STAKEHOLDERS

CONTEXT FOR EVERY UTILITY!

• EXPOSURE
• VULNERABILITY
• RELEASE
• ABILITY TO PRIORITIZE

THEN, GENERATE OUR INVESTMENT PORTFOLIO

FOREST VS. GRASSLAND TRENDS

TIMING TEMPS PRECIPITATION

FIRES ARE CLIPPED @ THE STATE BOUNDARY

LAYERING THE DATA



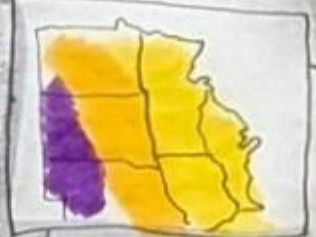
KNOWING HOW VULNERABLE AN ASSET IS TO FAILURE

DATA SCIENCE

EXPLORE

FUTURE FIRE POTENTIAL IN THE REGION

1994-2004



THEN LOOK @ FUTURE

LOOKING AT SHIFTS IN EXTREMES...



CARBON PATHWAY = MEASURE HUMAN ACTIVITY

• KNOWING REGION FORESTS & HOW THEY BURNED

• NATIVE AMERKANS DID THEIR OWN BURNS ON NORTHERN PLAINS

• NOT GREAT LOGGING PRACTICES IN EARLY 1900s, LEFT A LOT

• PYROMES

TO UNDERSTAND THE FIRE PATHS IN YOUR STATE FROM START, SIZE, DURATION, ETC.

TRENDS

9:30-10:30AM

WEDNESDAY
AUGUST
27
2025

NO REHEARSAL DINNER LAST NIGHT!

JUST LAST WEEK EXPLORING FIRE WEATHER INDEX



SCAN ME



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WILDFIRE INTERACTIONS WITH ENERGY SYSTEMS

WARRIOR BY NATURE...

FIGHTING FIRES CHANGED HOW I DO MY WORK...

CREST OF CASCADES - 1,000,000 ACRES
 MANY HOMES LOST
 LOST CAREERS
 LOST LIVES
 NEVER THOUGHT FIRE WOULD EVER CROSS OVER THE RIDGE WITH WIND

DO WE KNOW THE DIFFERENCE YET BETWEEN 45-60MPH

MORE ABOUT WORKING RELATIONSHIPS IN FIRES!

VALUE OF RISK IS VALUE OF RISK - NEED TO HAVE RELATIONSHIP IN ADVANCE!
 KNOWING WHO DRIVES, SHUTS OFF, COORDINATES, FIRST AID...

BEFORE FIRE SEASON, WE HAVE TALKS ABOUT FIRE SAFETY

NO SUCH THING AS NO RISK TO START A FIRE AS A UTILITY

PSPS IN EVERY SEASON NOW

WEATHER PATTERNS & FORECASTS CHANGE...

OUTREACH TO BE ON SAME 'FREQUENCY'

TEACHING FIRE FOLKS HOW VOLTAGE CAN HARM & KILL

NO MORE FIRE SEASON IN THE WEST!

OUR CHIEF DOES NOT WANT TO MEET YOU WHEN THE FIRE BEGINS... RELATIONSHIPS

LESSONS WERE KEY

- CALIFORNIA
- OREGON
- WASHINGTON
- MONTANA
- IDAHO

WILDFIRE MITIGATION PLAN

PNNL RESEARCH

LEARN WHAT TO DO BEFORE FIRE SEASON STARTS!

STEAL OTHER PSPS PLANS RIGHT NOW!

ADDRESSING CHANGE & TALKING TO PEOPLE

PROACTIVE RISK MANAGEMENT

UNDERSTANDING WILDFIRE MULTI-PERSPECTIVE LENS

TECH FOR MITIGATIONS

APPLY LESSONS FROM THE WEST

FIVE FOCUS AREAS

COLOR OF ENGINE SHOULDN'T MATTER!

EVERY DAY @ 10:00 AM we discuss the next 24 hours

WHAT DOES IT TAKE FOR OUR CREWS TO GO IN & STAY SAFE?

88 PERCENT OF DAMAGE DONE BY 3 PERCENT OF FIRE

ENERGY POLICY

ENERGY ENGINEERING TRANSMISSION DESIGN

CAMERAS ACROSS THE STATE FOR VISIBILITY

LOVE THIS INDUSTRY

EVERYTHING THAT HAPPENS IN CALIFORNIA EVENTUALLY COMES TO EVERYONE

100 TO 400 PAGES

EARLY DETECTION PREVENT!

PILOTS • MODELING
 PEER REVIEWS
 DATA FEEDS

DRONE AI

TO PUT TOGETHER YOUR PLAN

GRID SCOPE OPERATING LIKE GIANT GUITAR

"ANYTHING HAPPENING ON THAT POLE, YOU'RE GETTING AWARENESS"
 REDUCING HAZARD AWARENESS DELAY BY

ZERO TOLERANCE FOR FIRE EVENTS

WHAT IF WE COULD SEE GRID WHEN POWER IS OUT

- UNKNOWN LOCATION
- ACCIDENT/TREE DOWN
- EQUIPMENT FAILURE
- BURNT POLE STILL FUNCTIONING
- * EVERY OTHER POLE

ACTIVE GRID RESPONSE

GOAL: CATEGORIZE EVENT TO KNOW OF FAILURE PRIOR TO AN EVENT, TRACKING OF ARCS, AWARE OF VEGETATION

NO ONE ENTITY CAN FIGHT ANY OF THIS ALONE, GO TOGETHER

SO COOL YOU SAT DOWN WITHOUT A WORD...

THAT MOMENT ONE ALERT SAVES 5,000 ACRES

10:45-12:00PM

WEDNESDAY AUGUST 27 2025

IF YOU'RE NOT MAKING STORIES, YOU'RE TELLIN' EM

UNDERGROUND NOT ALWAYS THE ANSWER!



SCAN ME



REDDTALE COMMUNICATIONS

UTILITY WILDFIRE MITIGATION: CONSUMER-OWNED PERSPECTIVE

HOW ARE UTILITIES DOING THEIR PLANNING?

FROM FEMA & WHITEHOUSE

To consulting

TO PUBLIC SERVICE

ADDRESS WHAT UTILITIES ASK FOR!

HAVE YOU HEARD OF APPA?
AWESOME!



HAZARD TOOL KIT for FREE!



3 KINDS OF ELECTRIC UTILITIES

MEMBERS OWN 10 PERCENT OF GENERATION

REPRESENT **2,000** PUBLIC POWER UTILITIES



ACROSS THE U.S.

MID

TINY

HUGE

NEED TOOLS TO REPRESENT THEM ALL

NO BORDERS IN WILDFIRE

FOCUSED ON MUTUAL AID

USE THEIR KNOWLEDGE & WILDFIRE EXPERIENCE TO SUPPORT SMALLER

APPA = VOICE OF PUBLIC UTILITIES
"NEED TO FOLLOW-UP ON THAT VEGETATION"



WORKING GROUPS

AI, LOAD BALANCING, & **WILDFIRES!**

ADVOCATING FOR PUBLIC POWER
GETTING POLICY TO SUPPORT OUR members

KNOW THE ISSUE

BE SURE YOU LISTEN TO THE TRUE **NEED** OF UTILITIES



SMALL UTILITY

HUGE WILDFIRE

BEING AWARE OF CONCERNS TO AVOID BANKRUPTING SMALLER UTILITIES

WE LOVE TO CONNECT UTILITIES

TRAINING:

- SEMINARS
- ONLINE/VIRTUAL
- TABLETOPS
- ... FREE!!



MITIGATION STRATEGIES BY CATEGORY

TEMPLATE

GEARED TO SMALL TO MEDIUM

AI

WILDFIRE PLANS

PSPS

LEGISLATION

ADVISORY COMMITTEE

LEGAL DRIVER

EXPECTED COMPONENTS

PUBLICLY AVAIL. **PLANS**

IGNITION RISK

INSURANCE COSTS

MITIGATION PLANS
(SOOO MANY)

CONTEXT of PLAN

HELP WITH APPROVALS
UNDERSTANDING DEPENDENCIES
TIMEFRAMES
SPECIAL PROVISIONS
NEW ISSUE = NEW PLAN
FEATURE
WEST TO EAST PHENOMENON

... ABILITY TO FILTER
... DATA INTEGRITY & SEPARATION
... UPDATES TO 3 YEAR PLAN MOVE
... GRID DESIGN
... VEGETATION MANAGEMENT
... ANALYTICS ARE IMPROVING
... OPERATIONAL RESPONSE

BONNEVILLE

... 31 DAMS OPERATING IN NORTH WEST

DO NOT GENERATE POWER

- FEDERALLY-OWNED
- FOLLOW SAFEST RULES 'BARE HANDING'
- OPERATE ELECTRIC BACKBONE

PNNL DATABASE

WILDLIFE MITIGATION PLAN DATABASE

DO WE KNOW ACTUAL COSTS TO CUSTOMERS for WILDFIRE MITIGATION (NO LINE ITEM JUST YET)

YET??

HALF OF BUDGETS FOR UPGRADES
LEARNING ABOUT BUNDLES OF COST

1:00-2:00PM

WEDNESDAY
AUGUST
27
2025

HAVE NEVER SEEN BETTER OPPORTUNITY OR CATALYST FOR TRUE COLLABORATION THAN WILDFIRE!



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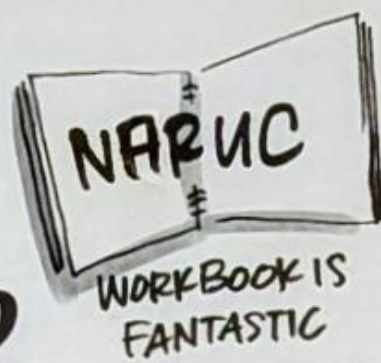


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KNOWING OUR DOCUMENTS WILL ALWAYS BE EVOLVING... UTILITY WILDFIRE MITIGATION: LEVERAGING EXPERIENCE FROM THE WEST

500,000
OUT OF 12,000,000
ACRES

\$8-9,000,000,000.00
IN COSTS PER YEAR
TO RECOVER FROM FIRES



TEXAS CREEK

MAUI FIRE

- 1,000,000 ACRES
- LIVESTOCK
- NUCLEAR
- REIGNITED
- SMALL START

THESE WERE BOTH
DOWNWIND
& WOULD BENEFIT FROM
ADVANCED PLANNING

**CURRENT
SUCCESSFUL
STRATEGIES!**

WESTERN PATTERNS
REVEAL HOW WE RELY ON REPORTING
& ACCURATELY CATALOGUING FIRES

PATCHWORK
OF METHODS &
APPROACHES

- MODELS, APPROACHES,
DATA SETS, & EXPERIENCE

**KNOWING THE
WHY**

NEED COORDINATION
TO FIRM UP THE BEST
BASELINE



**HERE IS
THE PLAN**

PSPS PROTOCOL
for specific area

LANDSCAPE RISK
OVERLAYED WITH
ASSETS

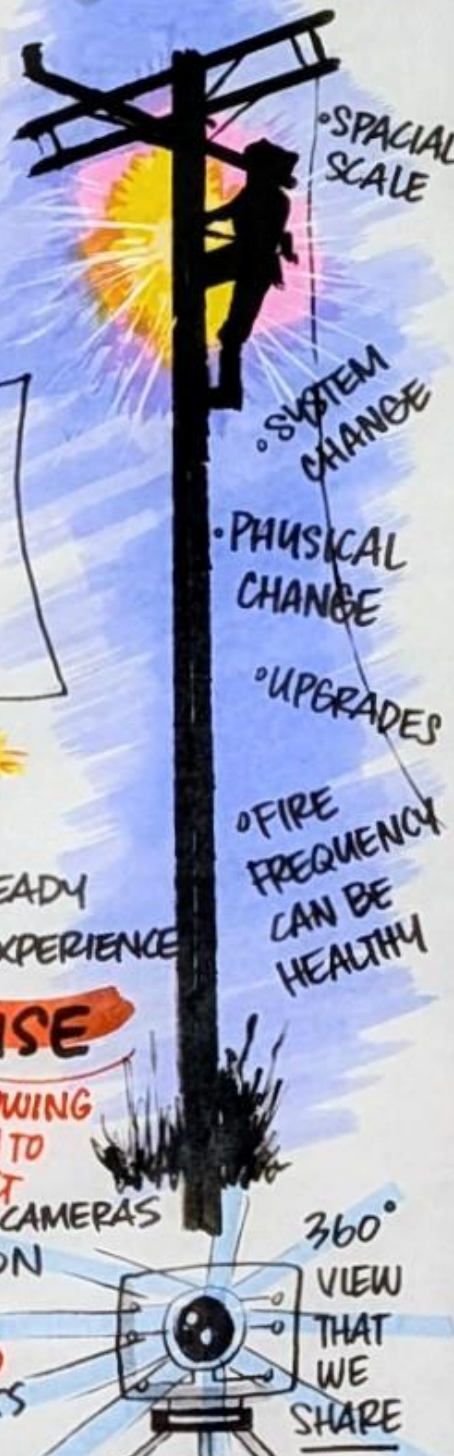
WHAT DO YOU
ACTUALLY DO
NOW?

- FEELS GREAT TO BE READY
- DRAWN ON PREVIOUS EXPERIENCE

LAYERED DEFENSE

- CUSTOMER SUPPORT
- PSPS APPROACH
- KNOWING HOW TO REACT
- SCENARIO
- PANEL AI CAMERAS
- SOFTWARE
- VEGETATION
- CONSULTANTS
- WEATHER STATION DATA

TELLS US 'HEALTH' OF ASSETS



CLEAR 6' FROM TIER 1 ASSET VERSUS 10' FROM TIER 2 TO STAY IN SERVICE ON HIGH RISK DAYS
PAY ATTENTION TO THE GROUPS YOU ARE IN & REMAIN PROACTIVE & SUPPORT NECESSARY REGULATORY FRAMEWORKS LIABILITY, BUILDING CODES

thank you
FOR THE INVITE
FROM WASH. DC
... SORRY ABOUT
WEARING A TIE

LARGEST ENGINEERING
IN N. AMERICA
RISK
MGNT
PLAN

• NASSIM TALEB'S MODEL of "ANTI-FRAGILE" APPROACH TO GRID IN U.S.
• BE AWARE OF CAPABILITY TRAPS WITH WELL-INTENDED EFFORTS

• IN CASE OF WILDFIRE, YOU MIGHT MAKE IT WORSE IN LONG RUN THOU WELL-INTENDED

CRISIS = RISK

WILD FIRE

BEING BORN
IN IRAN IS
WHAT TAUGHT
ME THIS...

1ST
2ND
3RD
LINE OF
DEFENSE

EVERYTHING
BORN IN U.S.
WAS BORN OUT
OF CRISIS!

LOOK @ DEEP
LAYERS OF
EVENTS

IF YOU FAIL,
BE READY TO
RECOVER!

CAPABILITIES

EROSION

REPLACEMENT PLAN

SHORT-SIGHTED

"BURNING PLATFORM 1988"

USE PSPS TO MORE MANAGEABLE
OPTION FOR LONG-TERM SOLUTIONS

FOR XCEL PLANS,
ARE THEY PUBLIC?

YES!

NO FILING REQUIREMENT

LOOKING @
BROADER
PSPS
EXERCISES

HEY! CAN YOU
TELL US
HOW MUCH YOUR
RISK INVESTMENT
REDUCED THE RISK?

MORE REQUESTS
for METRICS...

IS THERE A
HALF-WAY
PSPS?

2:15-3:30PM

WEDNESDAY
AUGUST
27
2025

**KNOW YOUR PSPS
TRIGGERS!**

HOURLY CONCERN.
EVENT-BASED SAFETY
1-4 HRS IN ADVANCE



DEPENDS
ON SPECIFIC
STATE ANALYSIS



SCAN ME





VERY
DIFFICULT
TO CALCULATE
ROI ON
WILDFIRE...

FOR WILDFIRE AND MORE

TRAINING

SCADA
ENGINEER

COMPUTER @
SUBSTATION

PILOT PROJECT
ON GRID ENHANCING
TECHNOLOGY

DATA FROM SENSOR
ALONG ENTIRE LINE

SHORTS, FAULTS, ICE,
FIRES, DEBRIS

VARIETY

- GRASSLAND
- HEAVY FOREST
- DRY TERRAIN

ADVANCE
TRANSMISSION
TECHNOLOGY

SEEING THE
CHANGES
ON OUR SYSTEM

OUR COMPANY WAS FOUNDED IN 2017

LOADING OUR LINES MORE EFFICIENTLY



OUR DEVICE RIGHT INSIDE YOUR DARK FIBER
USING DISTRIBUTED ACOUSTIC SENSING WITH LIGHTS

LET'S PUT PROPER KPIS IN PLACE TO MEASURE

NO CUSTOMER DATA (DO NOT WORRY)

WE HAVE 600,000 MILES OF LINES UNMONITORED

KNOWING
WHERE EVENT
IS ACTUALLY
OCCURED

MORE PRECISION THAN DRONES!



NO ELECTRON
LEFT BEHIND!

INTEGRATION
IS GOING TO BE
KEY



START BY READING SIGNAL
WITH LOOKING 3.5 METERS OF SPAN
TO ISOLATE THE FIRE/EVENT

10-45 MINUTE INCREMENT!

SO WHEN WE SEE & SAY REAL-TIME, WE MEAN IT...

1ST ALERT

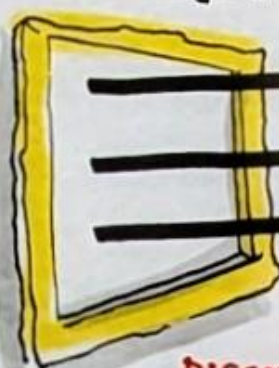
2ND ALERT

3RD ALERT

FULL PICTURE



NOW WE
ACTUALLY
KNOW!



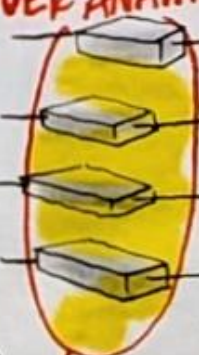
EARLY WARNING/ALERTS THAT PROGRESS
PICTURE POPULATES

MINDFUL TO TRAIN THE MODEL TO
AVOID ALERT FATIGUE... OSPREY NEST

... DISCOVER ANAMOLIES ON YOUR LINES!

COMPLETE PICTURE
FOR THE PSPS
JUSTIFICATION
for decision-makers

COMPLETE
CONTRACT



4 BEACONS
TO MONITOR
5 LINES...
INSTALLATION
TOOK LESS THAN
ONE WEEK



MONTHLY MEETINGS
TO CATEGORIZE EVENTS

3 YEAR-PILOT

DETERMINE
LEVEL
OF
DETAIL

PATROL
OUR
LINES

REFINE
THE
ALERT

EXACT LOCATION
OF DRIVER WHO
RAN INTO A POLE
CAUSING FATALITY

3:30-4:00PM

WEDNESDAY
AUGUST
27
2025

- EARLY IN THE RISK MANAGEMENT PLAN
- BORN OUT OF EMPLOYEE TECHNOLOGY RESEARCH
- BEGAN WITH FIBER CLOSE-BY

ADJUST HOW TO GO OUT &
RESPOND!



SCAN ME



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STATE

PERSPECTIVES & REFLECTIONS FROM THE DAY

HONORED YOU INVITED ME TO COME.
THIS IS A RISK FOR EVERYONE TO CONSIDER.
WE WANT YOU TO HAVE THE

TABLETOP WAS USEFUL:

- TRANSMISSION
- PIPELINE
- STRESSING A TRANSMISSION SCENARIO

TOOLS YOU NEED!

- CONTEXT
- COLLABORATION
- NETWORKING



MENTI POLL
TO LEARN WHAT **WORKED** & WHAT YOU WANT **NEXT!!**

SECOND COMMENTS ON VALUE OF EXERCISE & MATERIALS FROM PNNL. THIS HAS HELPED CREATE MOMENTUM TO KEEP GOING ON OUR OWN EXERCISE.

... WE WANT MOST DIVERSE AUDIENCES

I'M LEAVING WITH IDEAS

FOR OUR WORKSHOP OF 4 HOURS IN 2026!

MOST VALUABLE USE OF MY TIME IN THIS SPACE... WELL, **EVER!**

SAW REAL-TIME SCENARIO ON A WILDFIRE. VERY EYE-OPENING AS A REGULATOR TO SEE THE PLAN BEING **TESTED...**

MINNESOTA

"ONE SOLID METHODOLOGY"

WHY ARE YOU GOING?!?
IOWA DOES NOT HAVE ANY **WILDFIRES**

- INSURANCE
- INCREASE COLLABORATION
- UNDERGROUND LINES
- INDUSTRY CHALLENGES
- APPROVAL TIMELINES

IOWA

REFLECTIONS

INVESTORS WANT MORE CLARITY...
ALL BRAND NEW TO US!

JULY 2026

"WILDFIRE WORKSHOP"

RIGHT IN THE MIDDLE

KANSAS

WE KNOW

WHAT WE CAN DO & SHOULD DO IT BEFORE THE WRONG FOLKS DO IT FOR US!

PP ALLOW EXPERTS TO DO THEIR WORK WITHOUT BEGINNING @ LEGISLATION LEVEL FIRST.

- WE DON'T HAVE SHUT-OFFS YET
- PNNL HAS SHARED HOT SPOTS & TREND LINES & PYROMES

WE ARE ALL PUBLIC POWER. WOW, 20-40 PPL FOR UTILITY UP IN ALASKA. HAD NO IDEA!

NEBRASKA

THANK YOU

PNNL & CESER FOR PUTTING ON THIS **event**

NORTH DAKOTA

SOUTH DAKOTA

OUR STATE DOESN'T CURRENTLY HAVE **MANDATES**

THANK YOU for TEMPLATES

THIS HELPS OUR **SMALL** UTILITIES TO JUST START.

4:00-5:00PM

WEDNESDAY
AUGUST
27
2025

PP **STRATEGIES FOR SUCCESS**

YOU ARE DOING IT! DO NOT STOP!!



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