

Future Fire Scenarios for Regional Haze Planning

- Updates to Round 1 SIPs are due in July 2021, will include emissions reduction benefits expressed as 2028 Reasonable Progress Visibility Goals
- Monitoring data tracking metric changed “worst” to “most impaired” using chemical species sorting
- Tracking metric attempts to remove most contributions from wildfire and dust sources by complex/inferred relationship to measured carbon and dust on filters
- SIPs need to quantify progress to date and project future improvement by 2028 while fire is increasing
- Regional photochemical modeling of all emissions sets future visibility goals
- Draft RHR guidance allows for removing effects of increased Rx fire, unclear/uncertain process
- Source mix is complicated and variable at Class I areas in terms of source regions and in time – changing mix controllable U.S. & international vs. natural/uncontrollable
- Source apportionment regional modeling is limited to SO₄ and NO₃ impacts to align with tracking metric assumptions
- Future fire sensitivity scenarios in regional modeling bound relative SO₄ and NO₃ improvements to support weight of evidence for setting visibility goals at each of 100+ Class I areas in the WESTAR-WRAP region

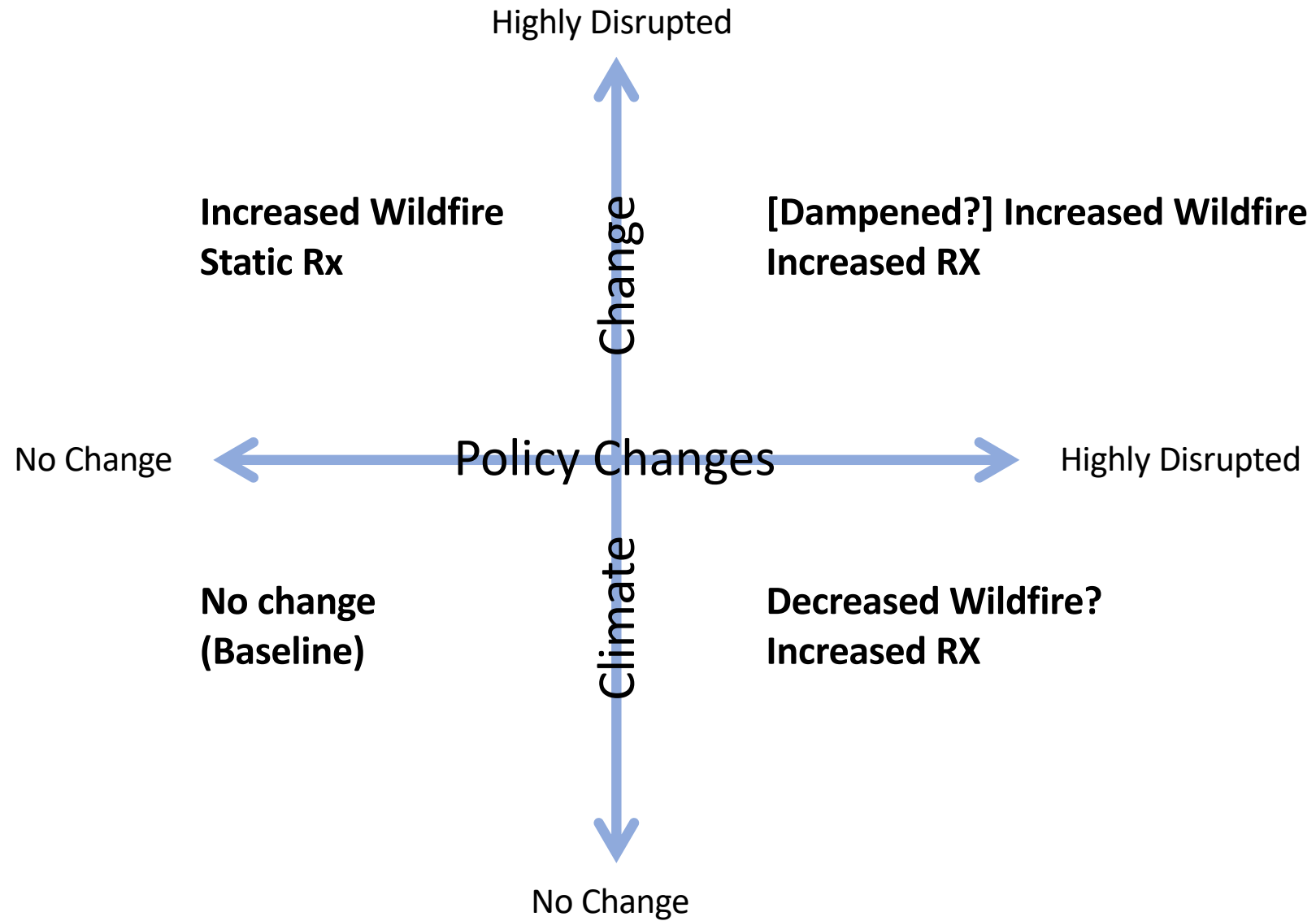
Western Regional Modeling Plan – March 27, 2019 update

Modeling Scenario	Timeframe	Objectives / Characteristics / Change from previous scenario(s)
2014 Shakeout v1 (actual emissions)	Dec. 2018 through early April 2019	<ul style="list-style-type: none"> • Compare Met and Biogenics datasets • Evaluate Boundary Conditions (BCs) • Uses 2014 NEIv2 data with limited corrections by states • Modeling Performance Evaluation • Identify Modeling Needs in Plan
2014 Shakeout v2 (actual emissions)	April through May 2019	<ul style="list-style-type: none"> • Finalize MPE results with improved inputs • Re-run GEOS-Chem global model for BCs with natural / anthro. sensitivity • Revised emissions – all CA anthro data, OGWG inputs • Will use recommended model configuration from v1
2013-17 Representative Baseline (planning emissions, all subsequent runs)	May through July 2019	<ul style="list-style-type: none"> • Apply v2 GEOS-Chem global model BCs • Revised emissions – new EGU, OGWG, and FSWG inputs <ul style="list-style-type: none"> ○ reflective of current emission rates and "normal" operations ○ "representative" annual fire emissions to smooth out variation • Basis of all 2028 scenarios, will use model configuration from v1 / v2 • Best reflect current emissions profile for each source potentially impacting Class I area visibility [source(s) identified from Q/d analysis]
Dynamic Model Evaluations (02, 14, 28)	May through Sept. 2019	<ul style="list-style-type: none"> • Use 2014 met, BCs, biogenics for all • Actual 02 and 14 emissions, OTB for 2028 • Provide modeled Regional Haze Progress for anthro emissions
2028 Emissions from Rules OTB / OTW	August through October 2019	<ul style="list-style-type: none"> • Model visibility impact / calculate RPG for each Class I area “if no additional controls” were adopted • 2028 OTB emissions <u>may be</u> the same as the Representative Baseline rate • Add international anthro contributions from Shakeout v2 • Gridded emissions to be used for WEP analysis
2028 Source Apportionment / Sensitivity	October 2019 through early 2020	<ul style="list-style-type: none"> • 2 sensitivity runs: increased emissions separately for wildfire and Rx fire • PSAT/OSAT run for state/source sector groups
2028 Control Strategy Run	Jan. through March 2020	<ul style="list-style-type: none"> • SCC-level “potential additional” SO₂, NO_x, and/or PM % decreases from each state • Model visibility impact / calculate RPG for each Class I area “if additional controls” were to be adopted

Key questions for a future scenario

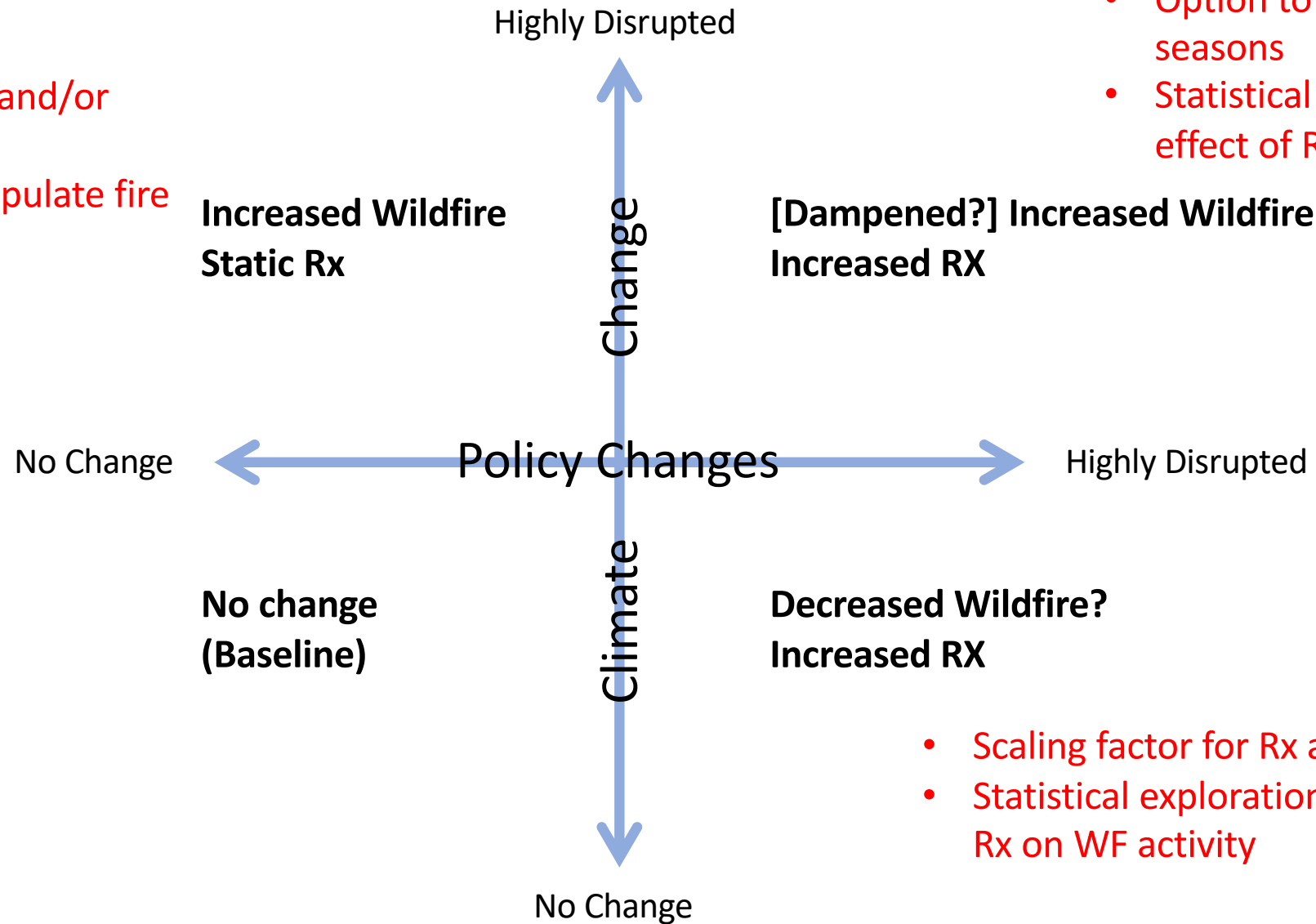
- What are the major drivers of change?
 - Policy/Management
 - Climate
 - Land use
- How to capture the highly variable nature of fire in one "inventory"?
 - Where?
 - When?
 - How much?
- What is the basis for comparison?
 - Baseline Period
 - Manipulate calculation inputs based on change agents

Future Scenarios Example



Future Scenarios Example

- Scale intensity and/or activity for WF
- Option to manipulate fire seasons



- Scaling factor for Rx activity
- Scale intensity and/or activity for WF
- Option to manipulate fire seasons
- Statistical exploration of effect of Rx on WF activity

- Scaling factor for Rx activity
- Statistical exploration of effect of Rx on WF activity

Background Reading

- Regional Haze Planning Round 1 Future Fire Methods:
 - [https://www.wrapair.org/forums/fejf/documents/task7/Phase3-4EI/WRAP Fire Ph3-4 EI Report 20070515.pdf](https://www.wrapair.org/forums/fejf/documents/task7/Phase3-4EI/WRAP_Fire_Ph3-4_EI_Report_20070515.pdf)
- Evaluation of revised regional haze tracking metric:
 - <https://doi.org/10.1080/10962247.2018.1537985>