National Park Service
U.S. Department of the Interior

Yellowstone National Park

Winter Use Adaptive Management Plan

Air Quality

4 June 2014, Jackson, WY

EXPERIENCE YOUR AMERICA

Air Quality: Summary of Monitoring

- Data collection has focused on travel corridor between West Entrance and Old Faithful
- CO, $PM_{2.5}$, PM_{10} monitored since 2002
- Monitoring shows AQ has improved since 2002
- NO_2, NO_x , and NO monitored since 2009

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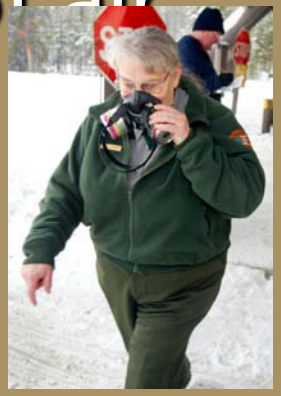
Air Quality: Summary of Impacts

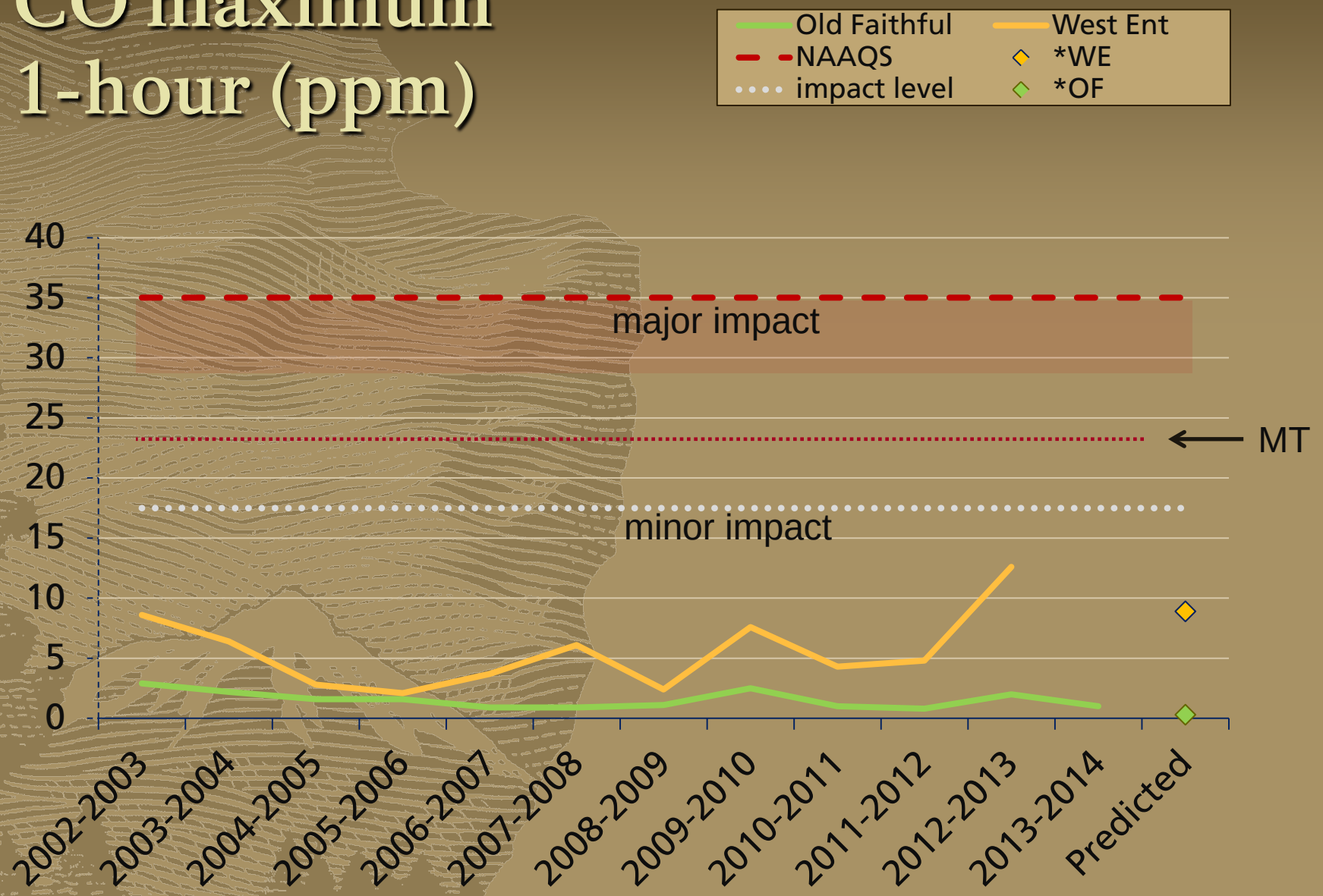
- In the 1990s an average of 795 two-stroke snowmobiles entered the park each day
  - As many as 80,000 per season
- Resulted in unacceptable levels of air pollution from CO, PM, and HC



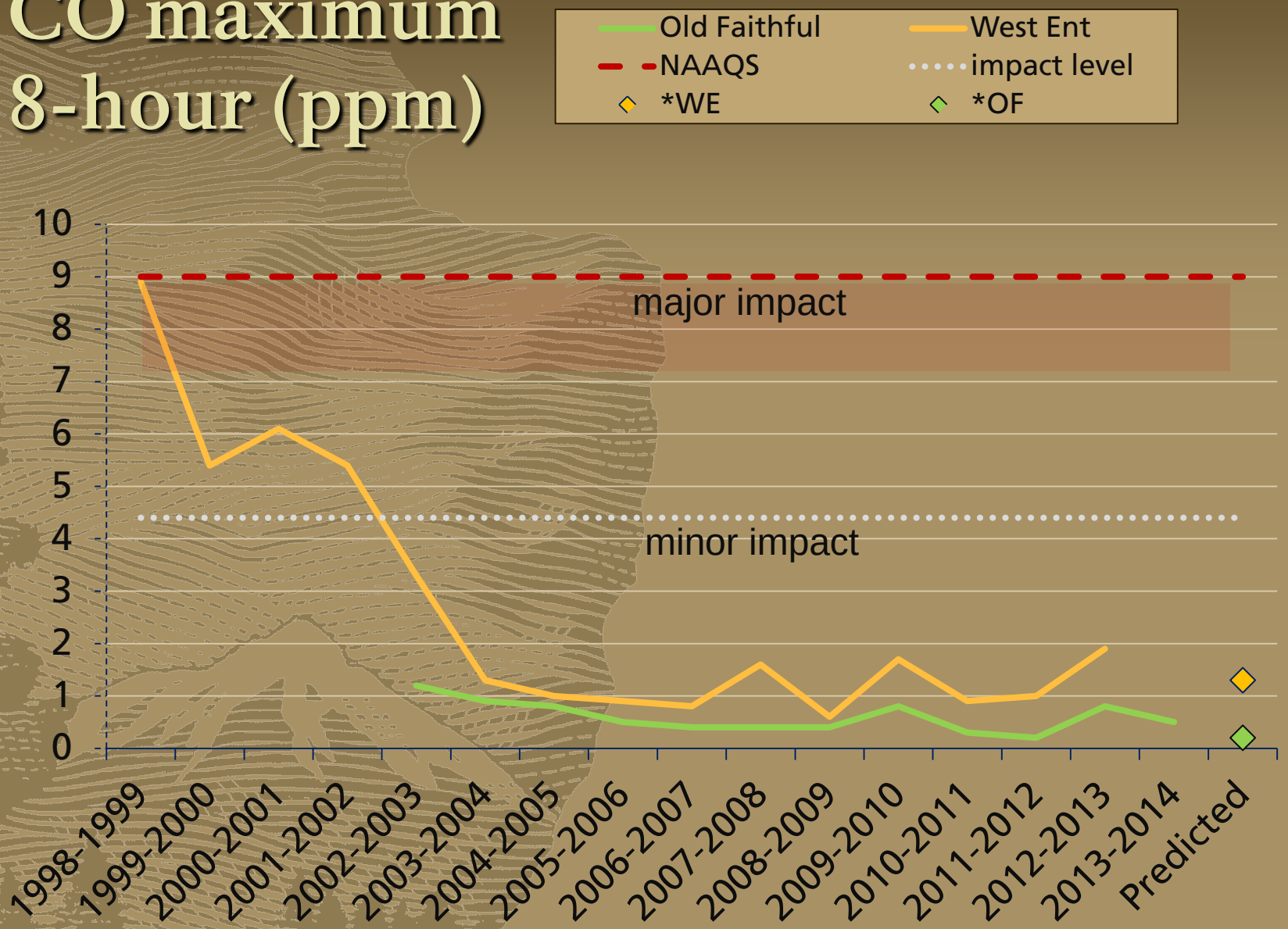
Air Quality: Summary of Impacts

- Managed use era: BAT requirements + fewer OSVs + reduction in idling + guides
- Resulted in reduction in CO, PM, and HCs

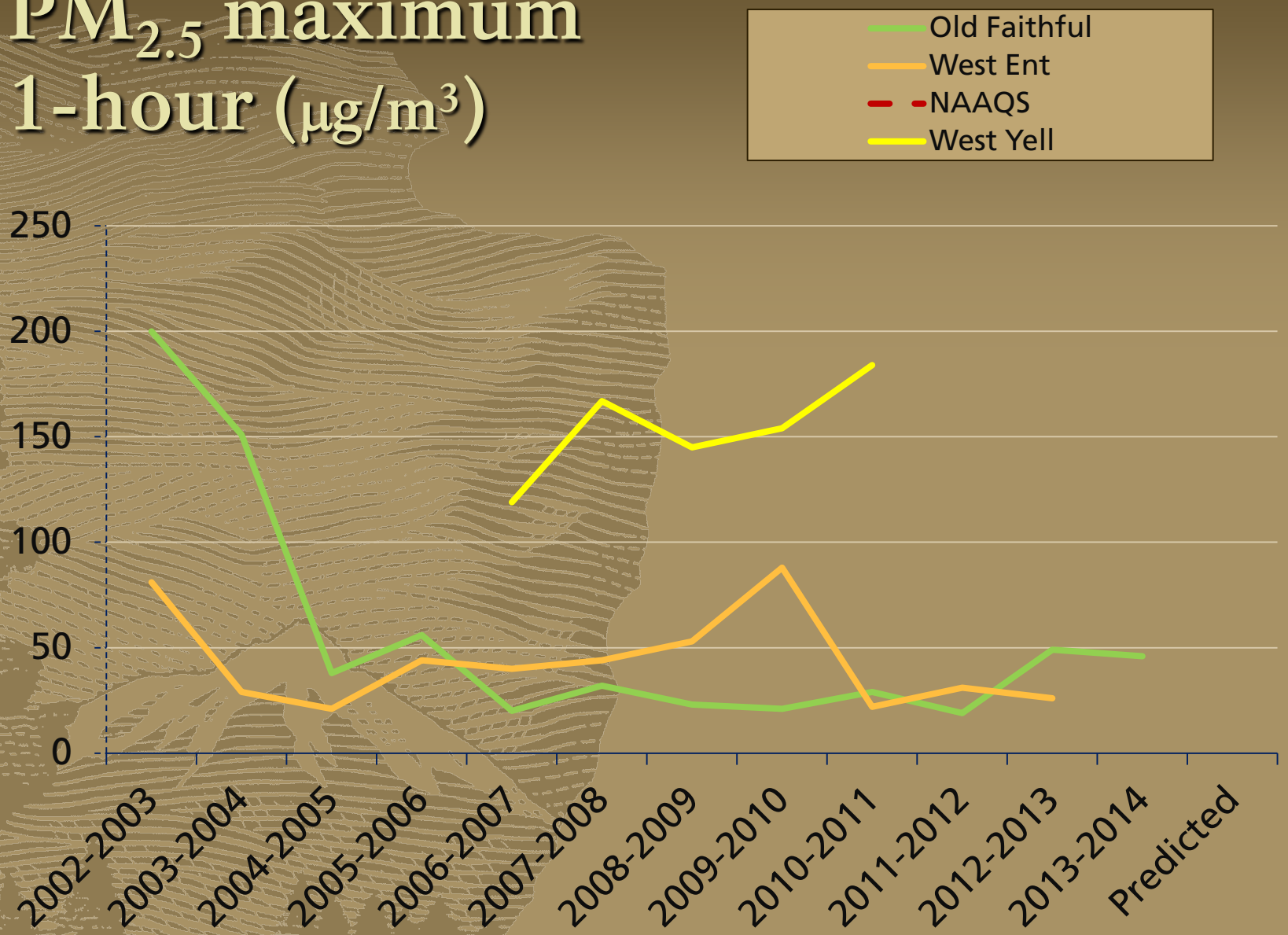
CO maximum 1-hour (ppm)



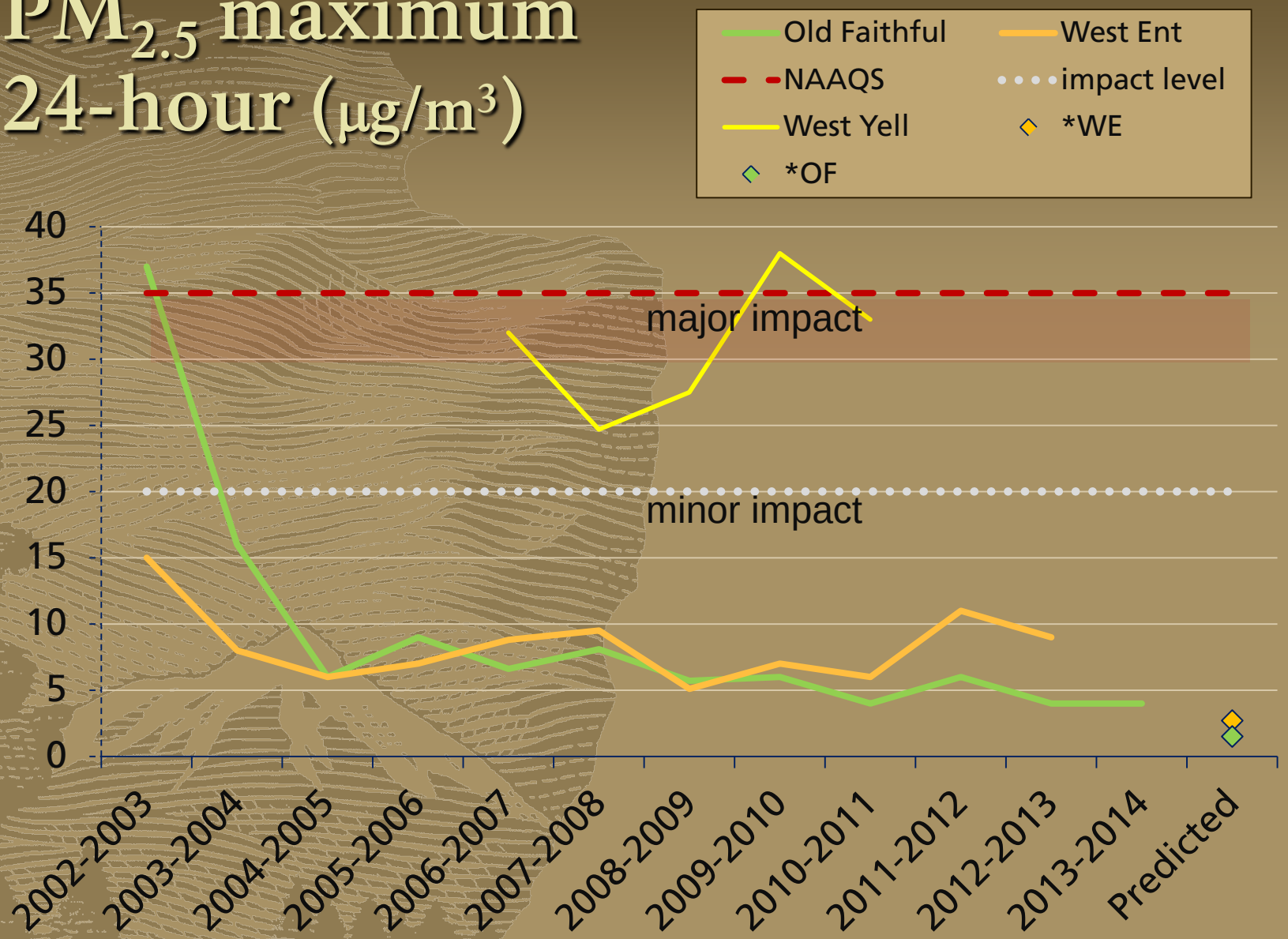
CO maximum 8-hour (ppm)



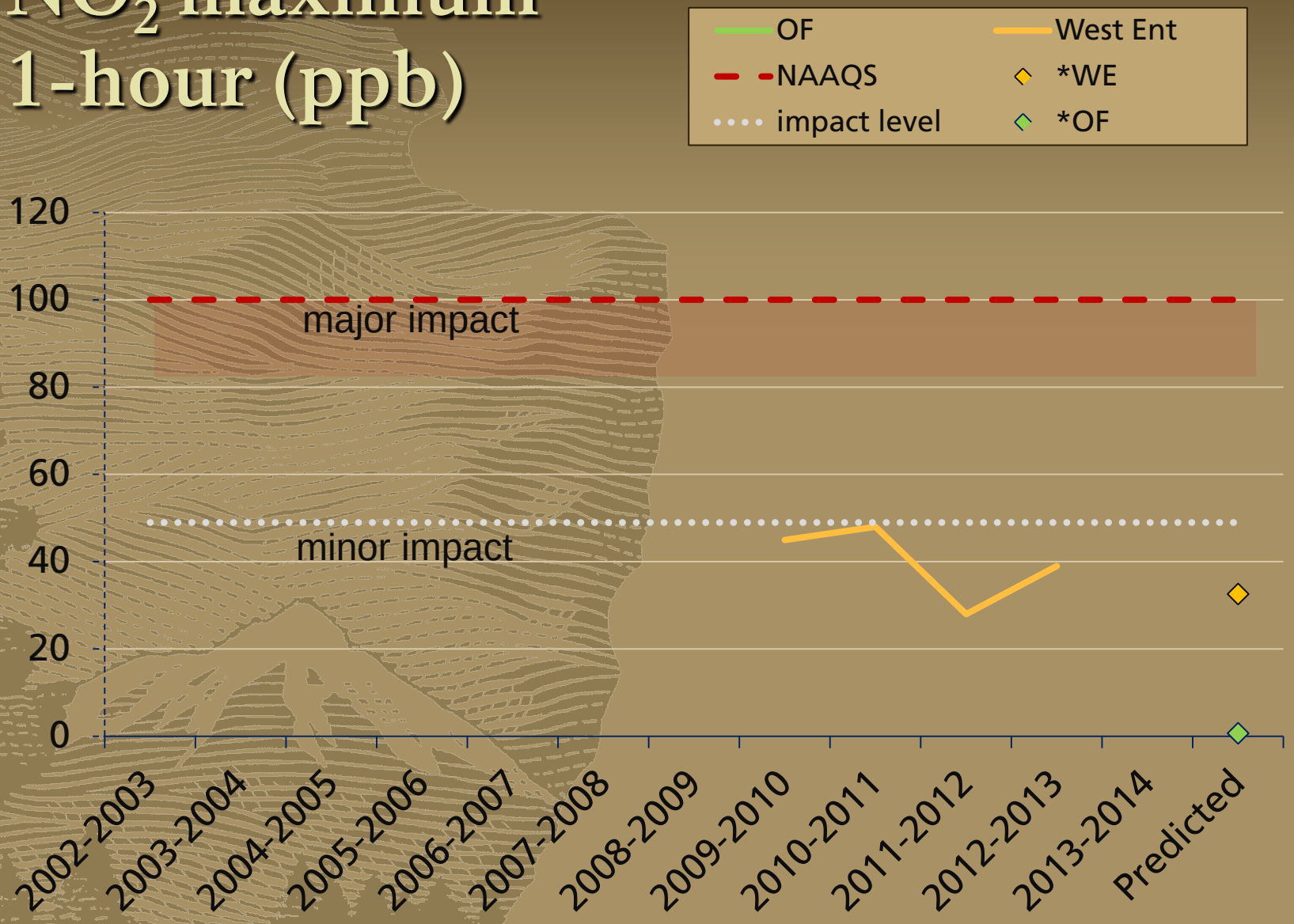
$PM_{2.5}$ maximum 1-hour ($\mu g/m^3$)



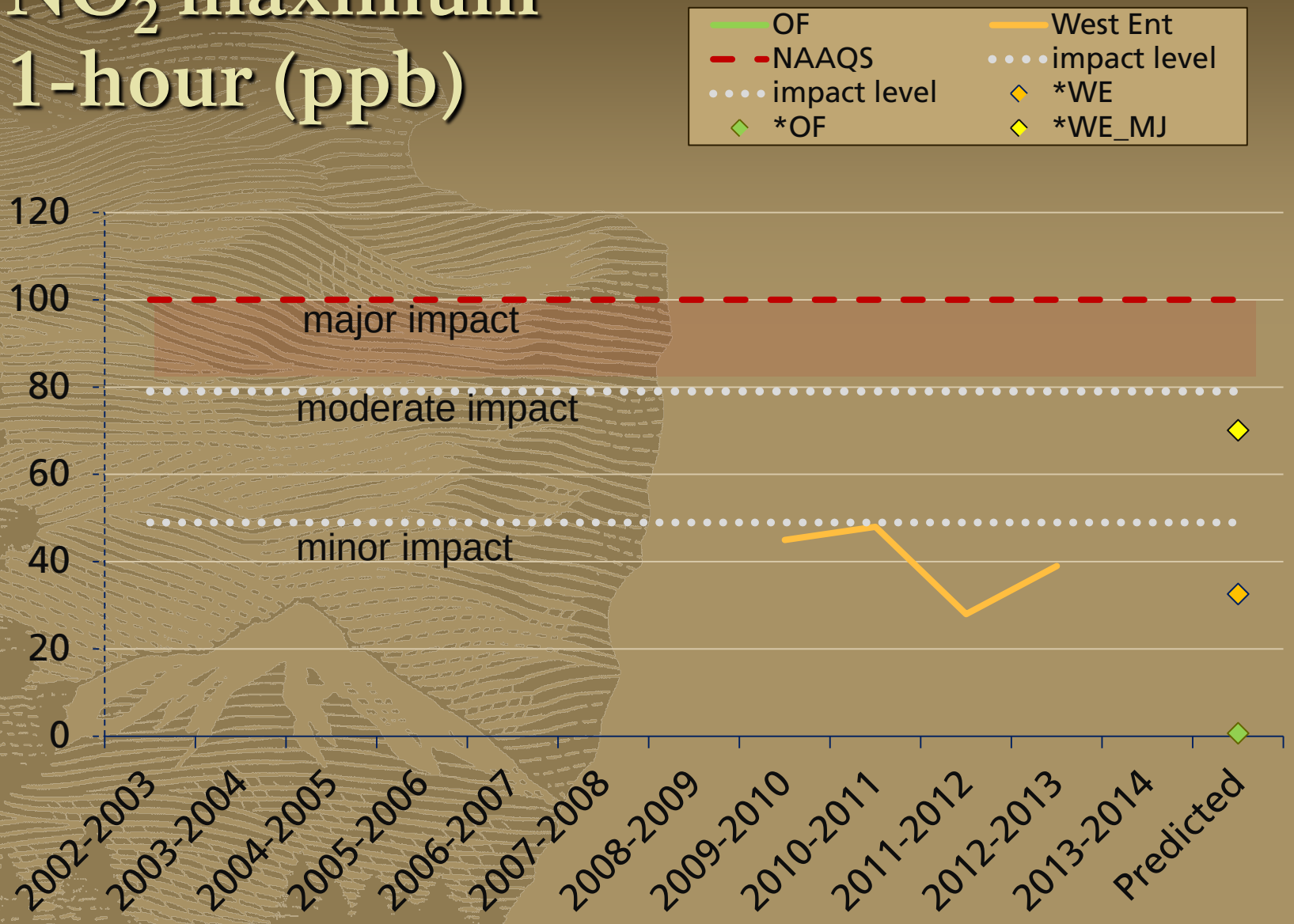
$PM_{2.5}$ maximum 24-hour ($\mu g/m^3$)



NO_2 maximum 1-hour (ppb)



NO_2 maximum 1-hour (ppb)



Monitoring Strategy: 1). Stay below limits defined in WUP

- *allow only BAT snowmobiles and snowcoaches*
- *allow only prescribed number and type of Transportation Events*
- Monitor travel patterns to assure they remain true to WUP assumption that biggest impacts occur in West to OF corridor
- Monitor compliance with speed limits
  - Increased speed may increase NO_2 emissions
- **Continue air quality monitoring at long-term sites**

Proposed: Monitoring Metrics for #1

- Continue West Entrance and Old Faithful
  - Carbon Monoxide (CO)
  - Particulate Matter ($PM_{2.5}$)
  - Nitrous Oxide (NO_2)
- New monitoring in West to Madison corridor
  - Nitrous Oxide (NO_2), NO and NO_x
- Experiment with different ways to analyze and report on results – average and mean values rather than hourly max values

Monitoring Strategy: 2). Comparability of Impacts

- Must be done through emissions monitoring
- Monitoring the ambient air quality will tell us whether the new mix of BAT snowmobiles and BAT snow coaches improves, degrades, or has a neutral effect on air quality

Proposed: Monitoring Metrics for #2

- Continue monitoring CO and $PM_{2.5}$ at Old Faithful and CO, $PM_{2.5}$, NO_2, NO_x, and NO at West Entrance

Monitoring Strategy: 3). Reducing Impacts in the Future

- Encourage the use of OSVs that are less polluting
- Document behaviors and circumstances that reduce emissions – reduced idling, lower speeds, other?
- What behavior increases and decreases NO_2, NO_x , and NO emissions?
- Coordinate with technology/emissions group

Proposed: Monitoring Metrics for #3

- Same as #1 and #2

Special thanks to our working group:

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