# Yakima River Basin Integrated Water Resource Management Alternative

- Package of elements designed to improve water supply and fish habitat
  - Fish passage
  - Structural and operational changes
  - New or expanded storage reservoirs
  - Ground water storage
  - Fish habitat enhancements
  - Enhanced water conservation
  - Market-based reallocation

# Integrated Water Resource Management Alternative

- Modeling assumptions
  - Combine elements
    - Bumping Lake Expansion – 458,000 acre-feet
    - Wymer Reservoir – Thorp to Wymer
    - Enhanced Conservation – includes KID pump exchange
    - Structural and Operational Changes – Subordination of Roza Power Plant to fill Wymer
  - Use same assumptions as each stand-alone element

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# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - April 1 TWSA
    - 4.6% increase on average
    - 4.6% increase in drought year 1994
    - 11.4% increase in drought year 2005
  - April-September diversion volume upstream of Parker
    - 5% decrease on average (due to Enhanced Conservation)
    - 4.1% increase in drought year 1994
    - 9% increase in drought year 2005

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# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Irrigation proration level (does not include additional irrigation releases from Bumping River)
    - 5% increase on average
    - 10% increase in drought year 1994 (28% to 38%)
    - 20% increase in drought year 2001 (40% to 60%)
    - 16% increase in drought year 2005 (38% to 54%)
  - September 30 storage
    - 221% increase on average
    - 390% increase in drought year 1994
    - 428% increase in drought year 2005

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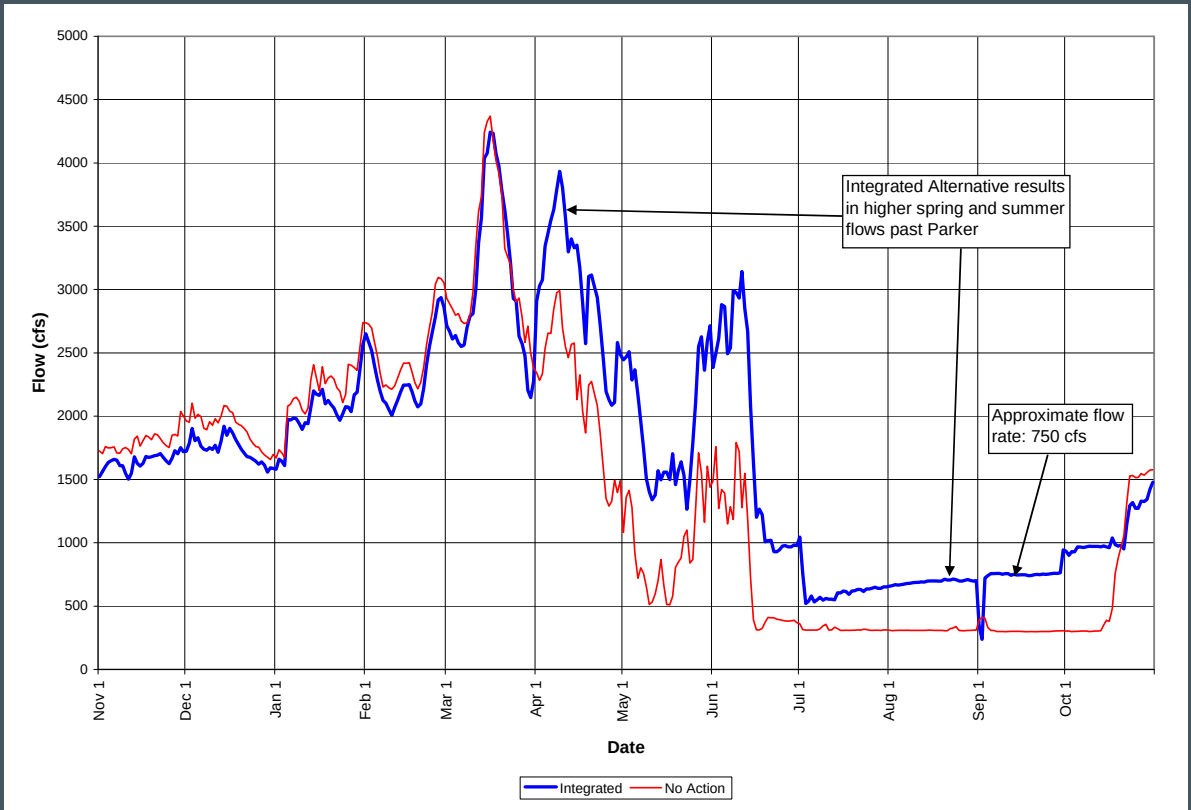
# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Irrigation supply

| Irrigation District | Average 1981-2005 (ac-ft) | | Drought Year 1994 (ac-ft) | | Drought Year 2001 (ac-ft) | | Drought Year 2005 (ac-ft) | |
|---|---|---|---|---|---|---|---|---|
| | No Action | Integrated | No Action | Integrated | No Action | Integrated | No Action | Integrated |
| Roza | 305,412 | 285,769 | 143,055 | 166,539 | 181,745 | 237,162 | 148,304 | 199,253 |
| KRD | 277,607 | 280,420 | 121,852 | 149,326 | 168,065 | 219,483 | 135,254 | 181,211 |
| Sunnyside | 426,674 | 360,824 | 359,339 | 330,159 | 411,196 | 377,179 | 371,355 | 343,618 |
| Wapato | 566,896 | 497,252 | 398,933 | 388,528 | 454,412 | 469,075 | 417,186 | 427,243 |

# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Yakima River at Parker median flow

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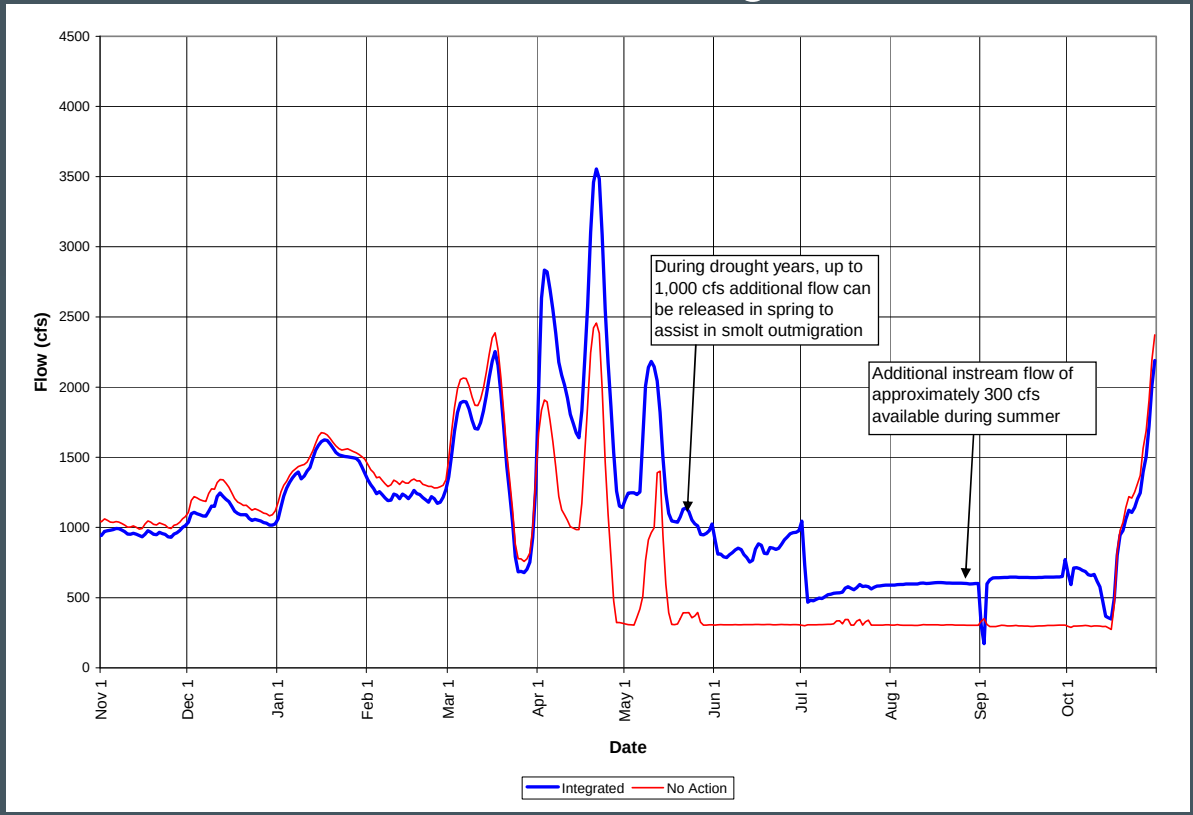
# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Yakima River at Parker drought flow - 1994

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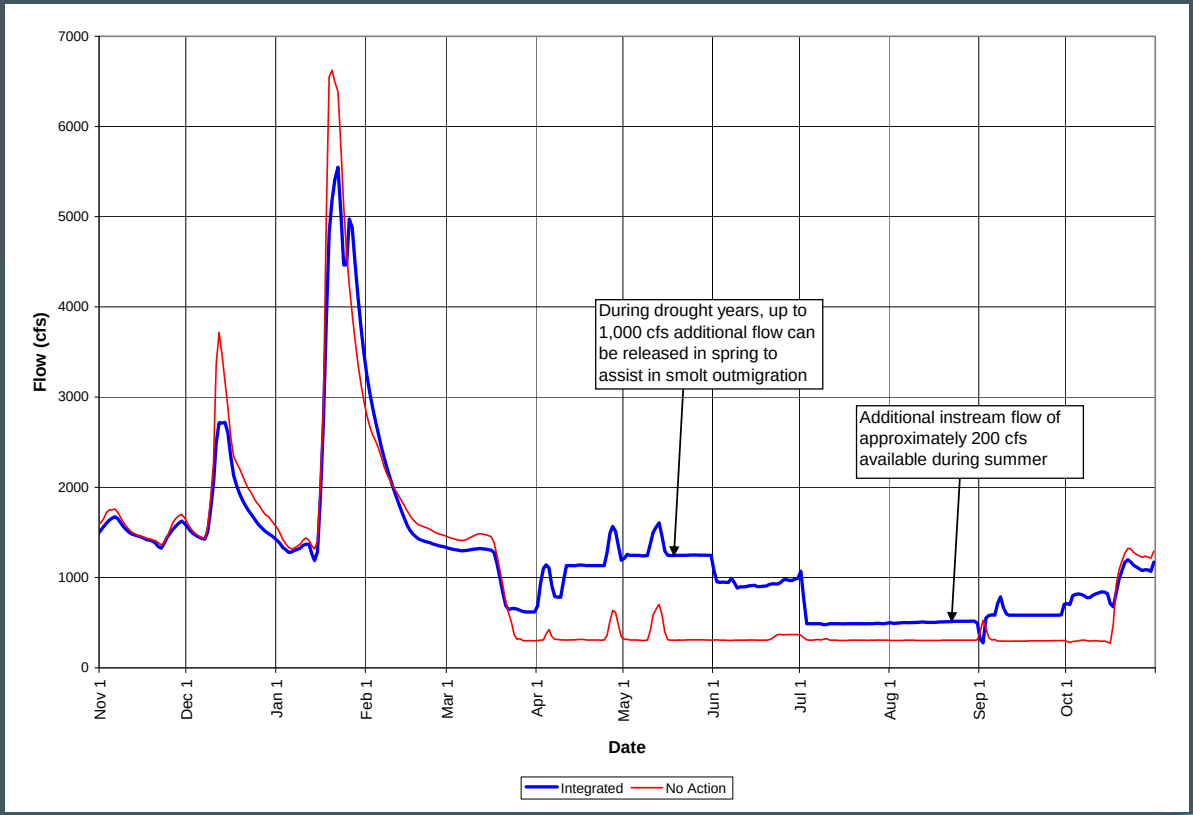
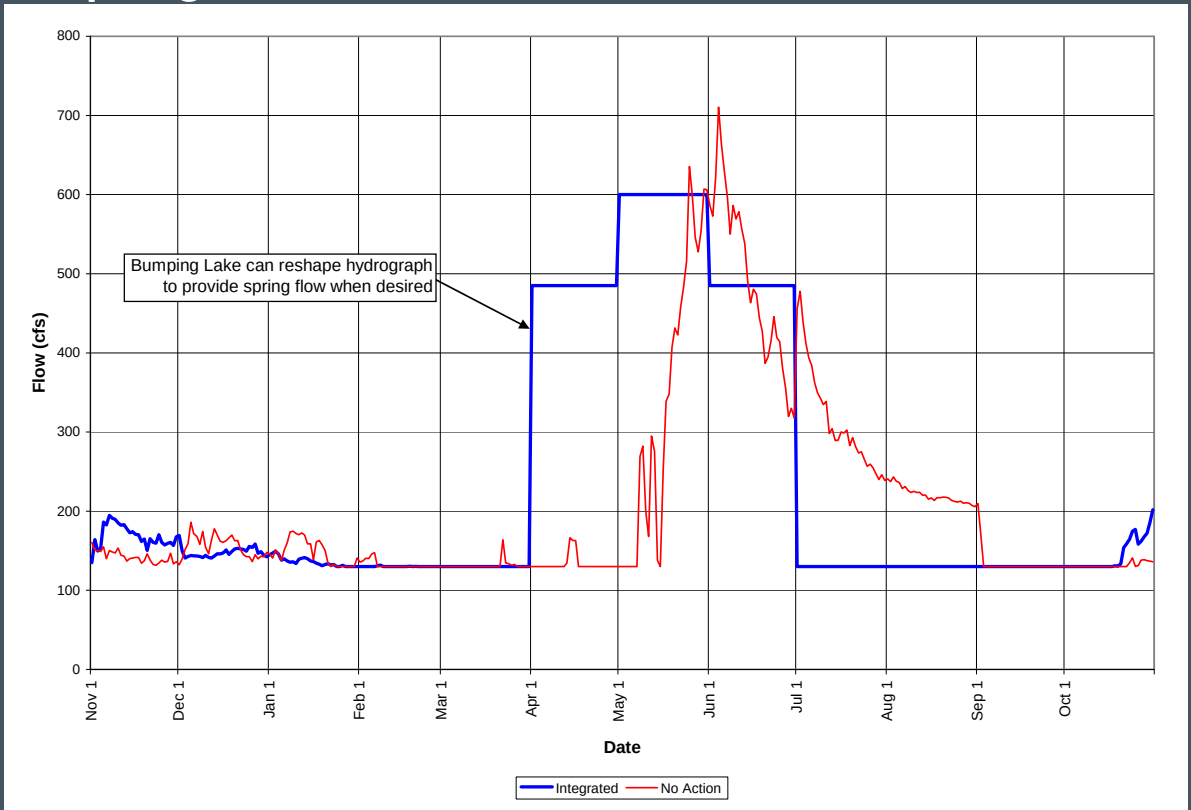
# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Yakima River at Parker drought flow - 2005



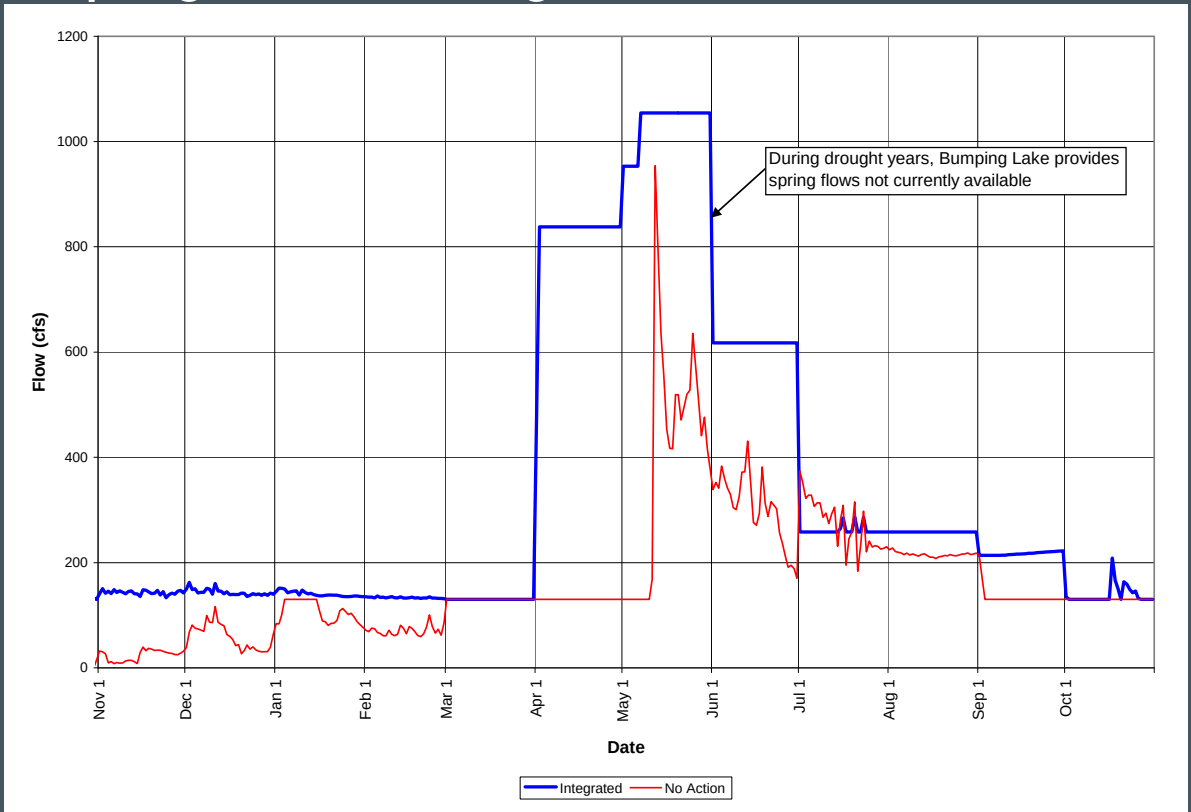
# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Bumping River median flow



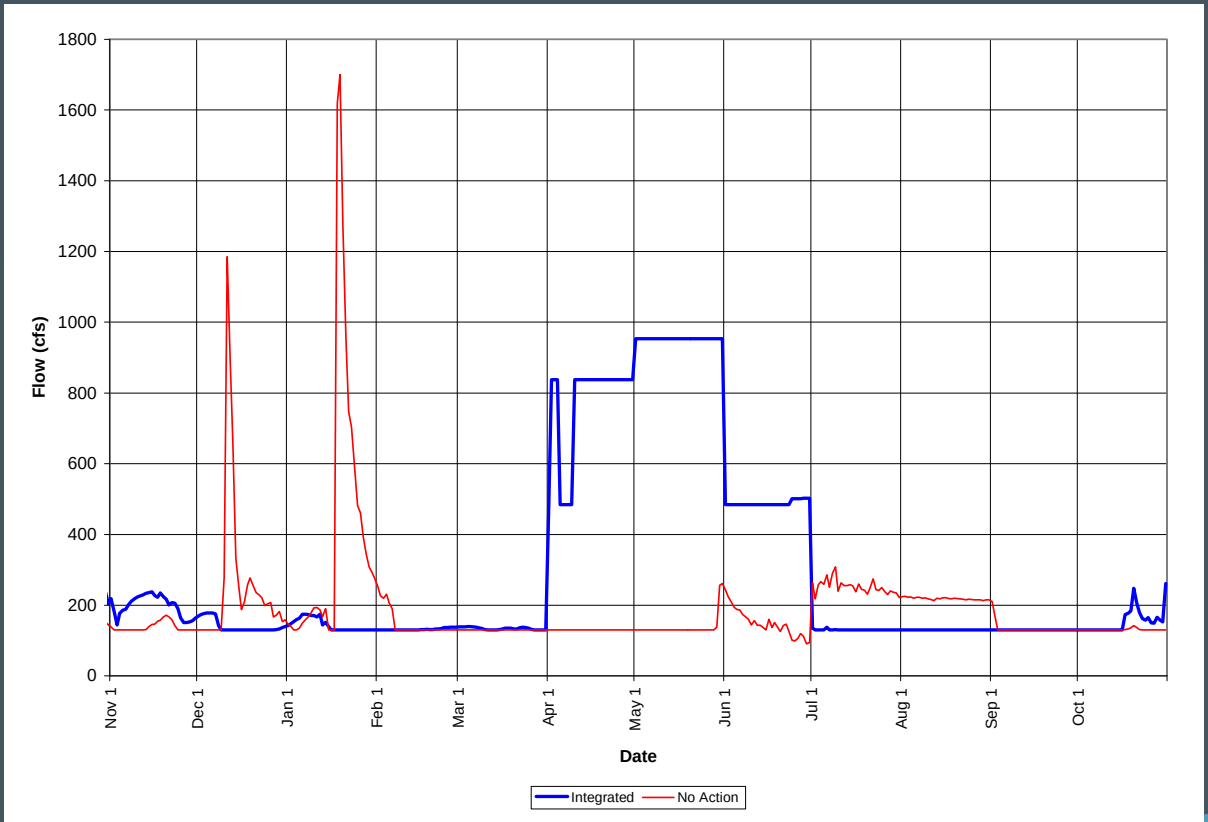
# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Bumping River drought flow - 1994



# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Bumping River drought flow - 2005

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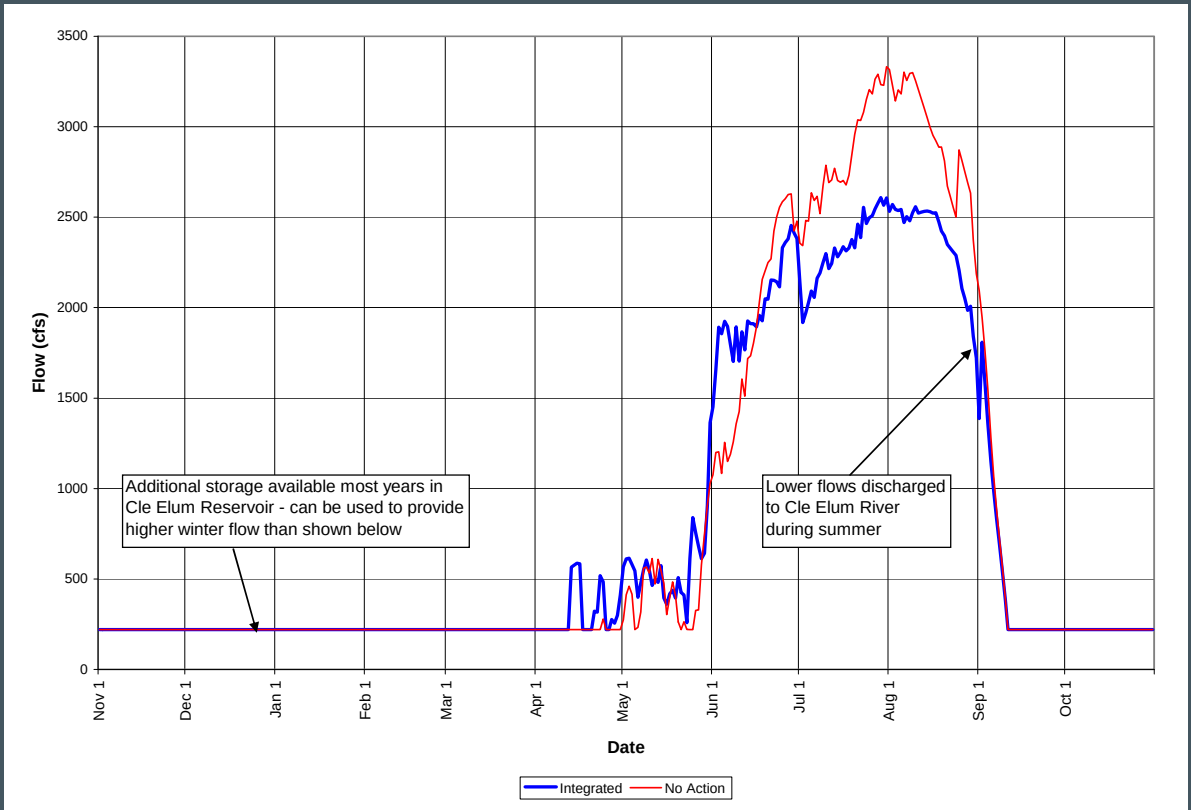
# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Cle Elum River below dam median flow

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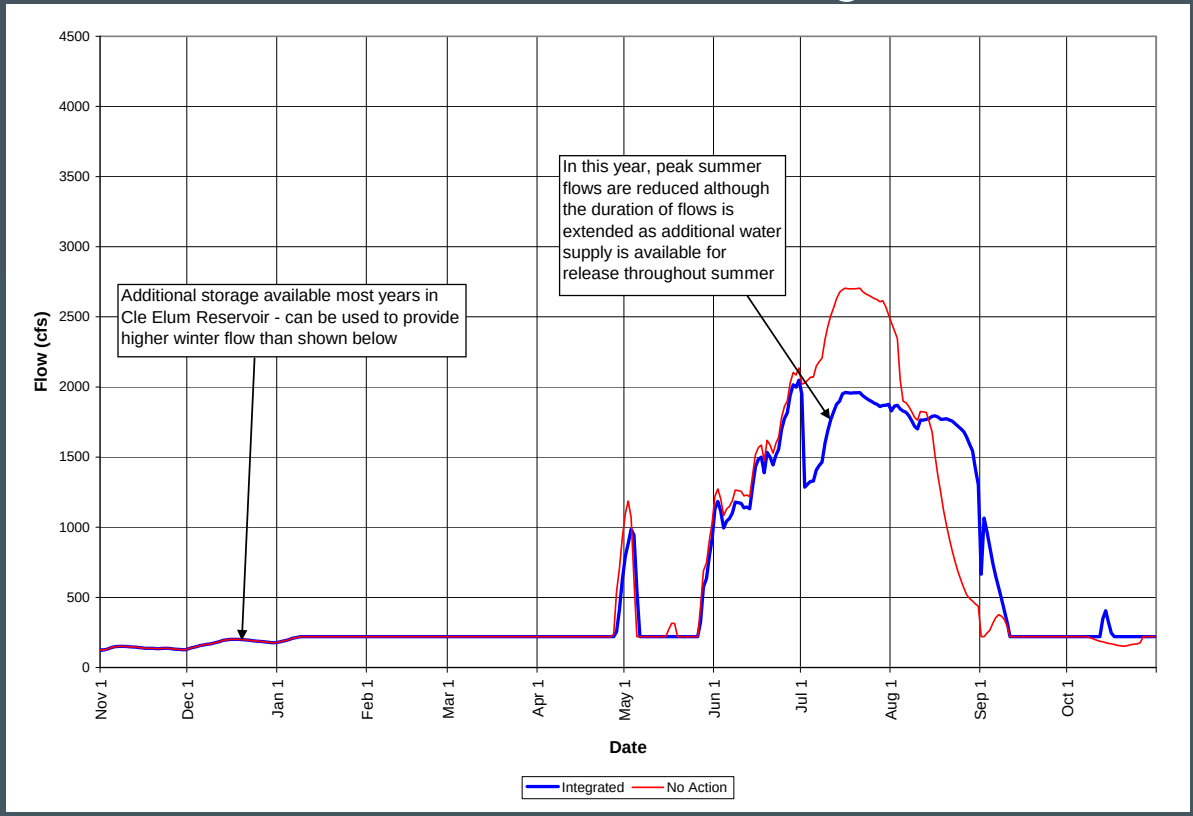
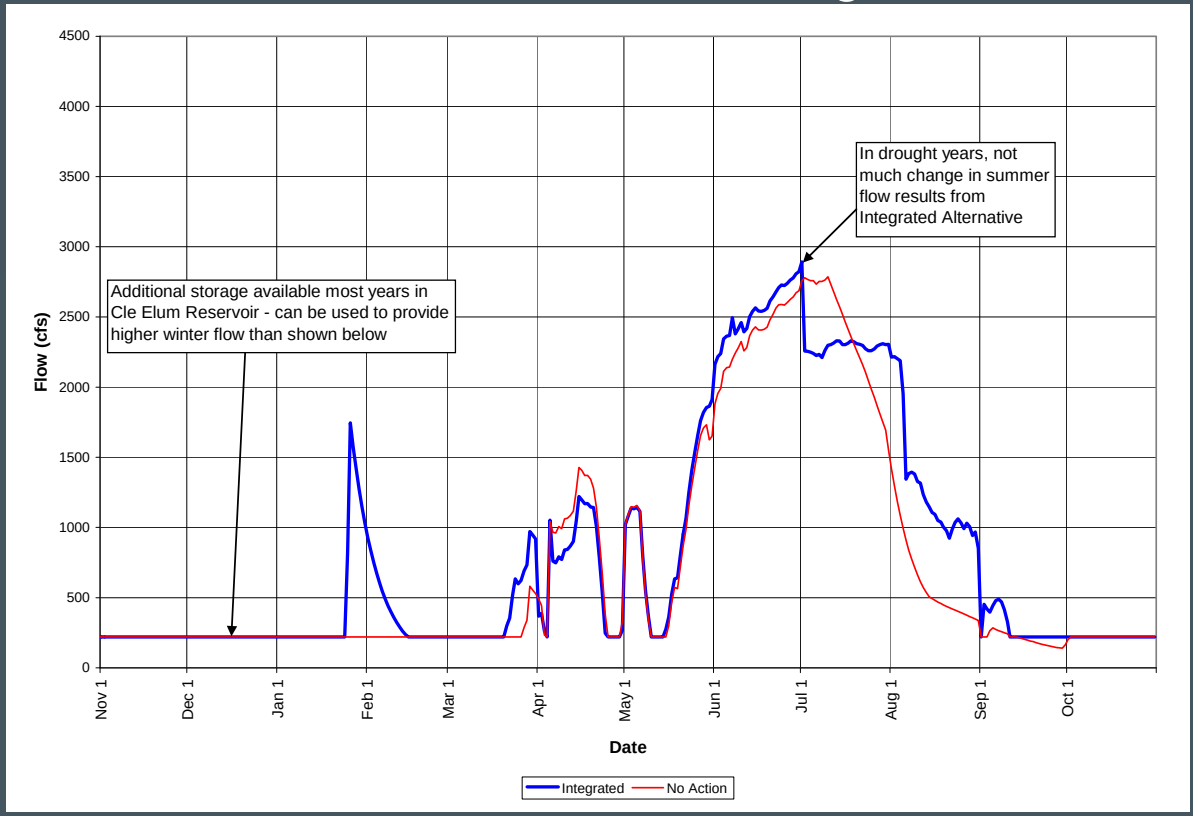
# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Cle Elum River below dam drought flow - 1994



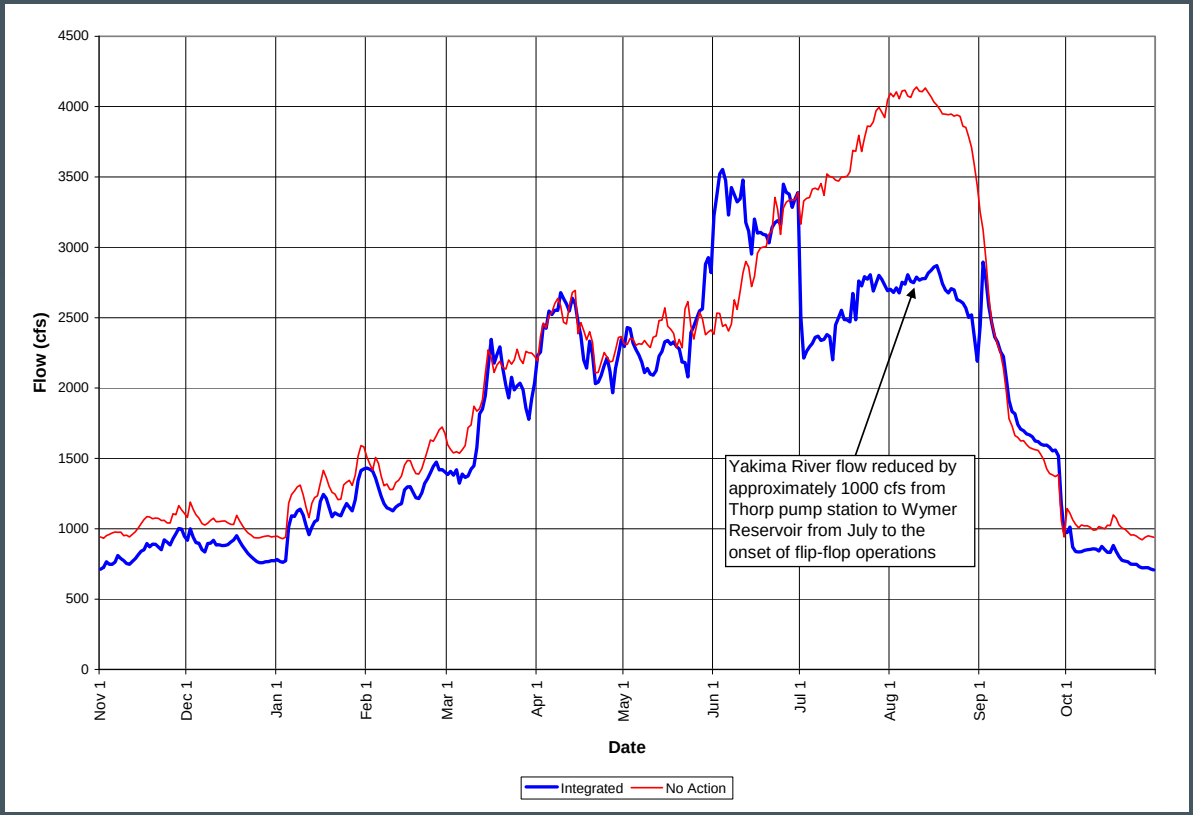
# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Cle Elum River below dam drought flow - 2005



# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Yakima River at Umtanum median flow

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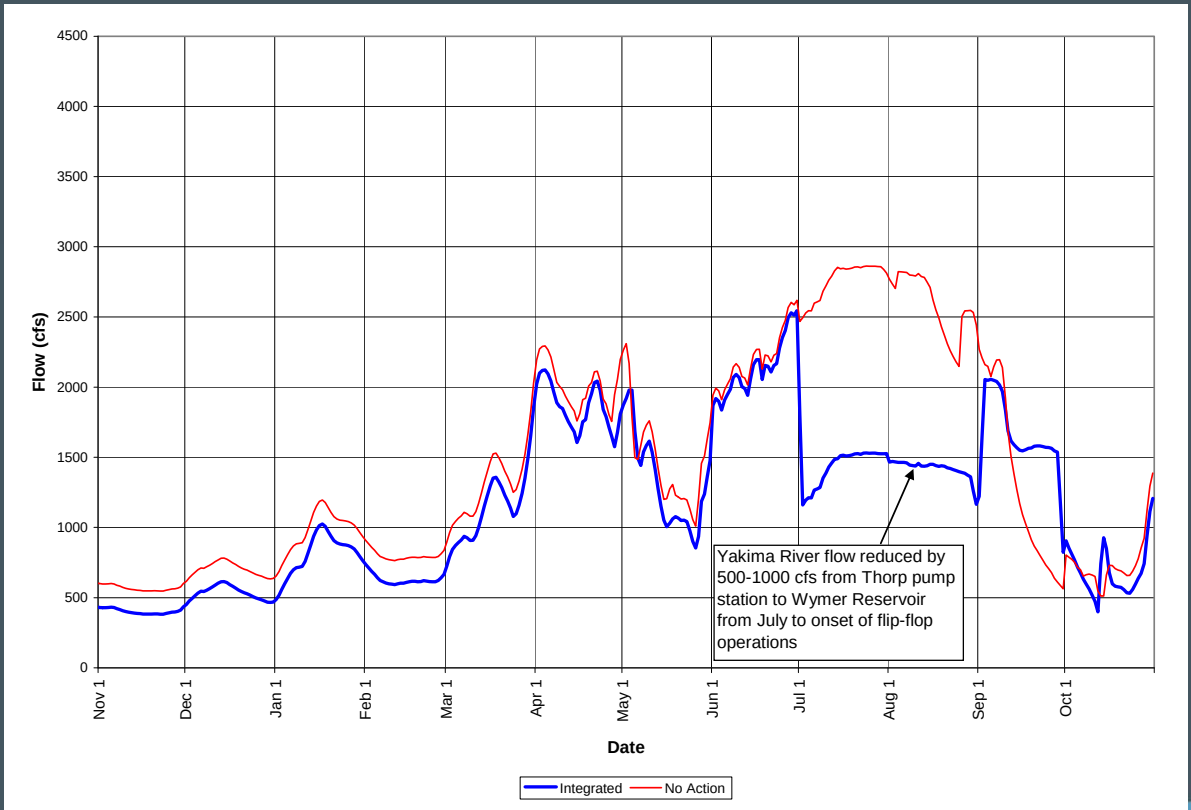
# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Yakima River at Umtanum drought flow - 1994

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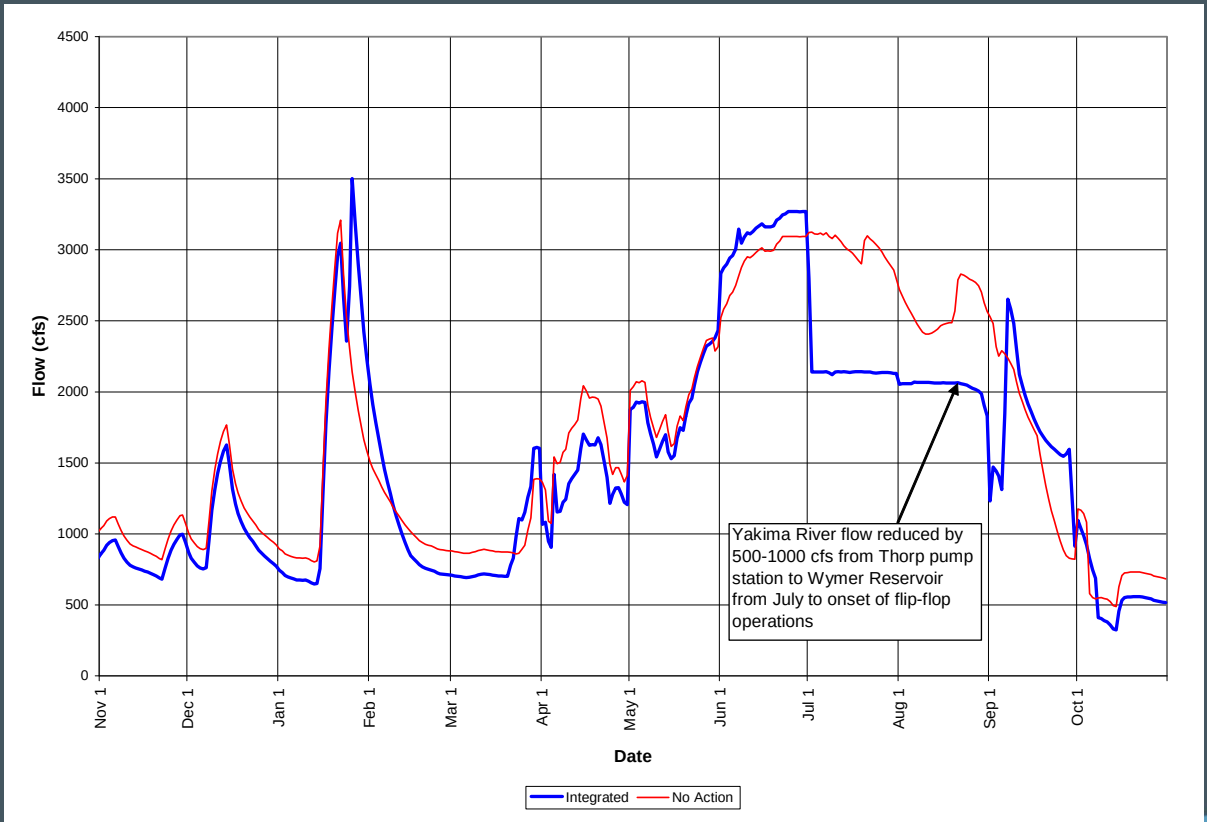
# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Yakima River at Umtanum drought flow - 2005

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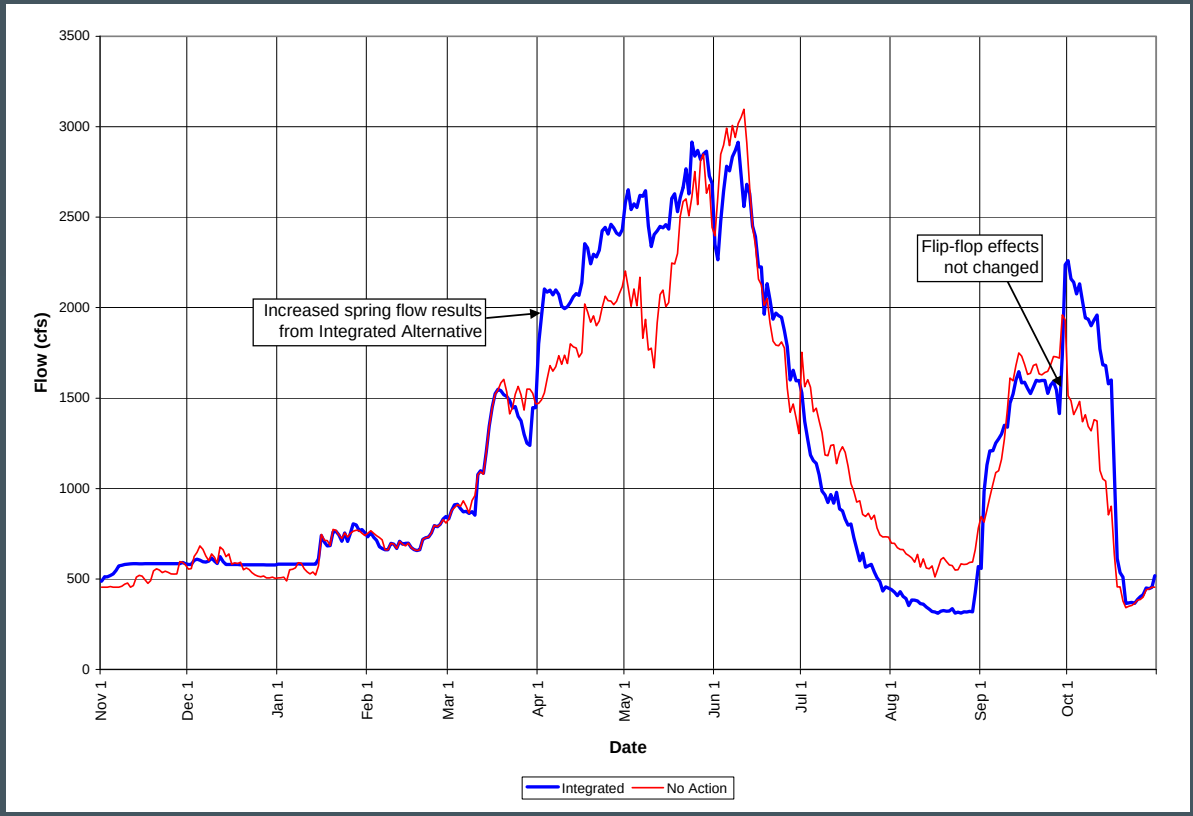
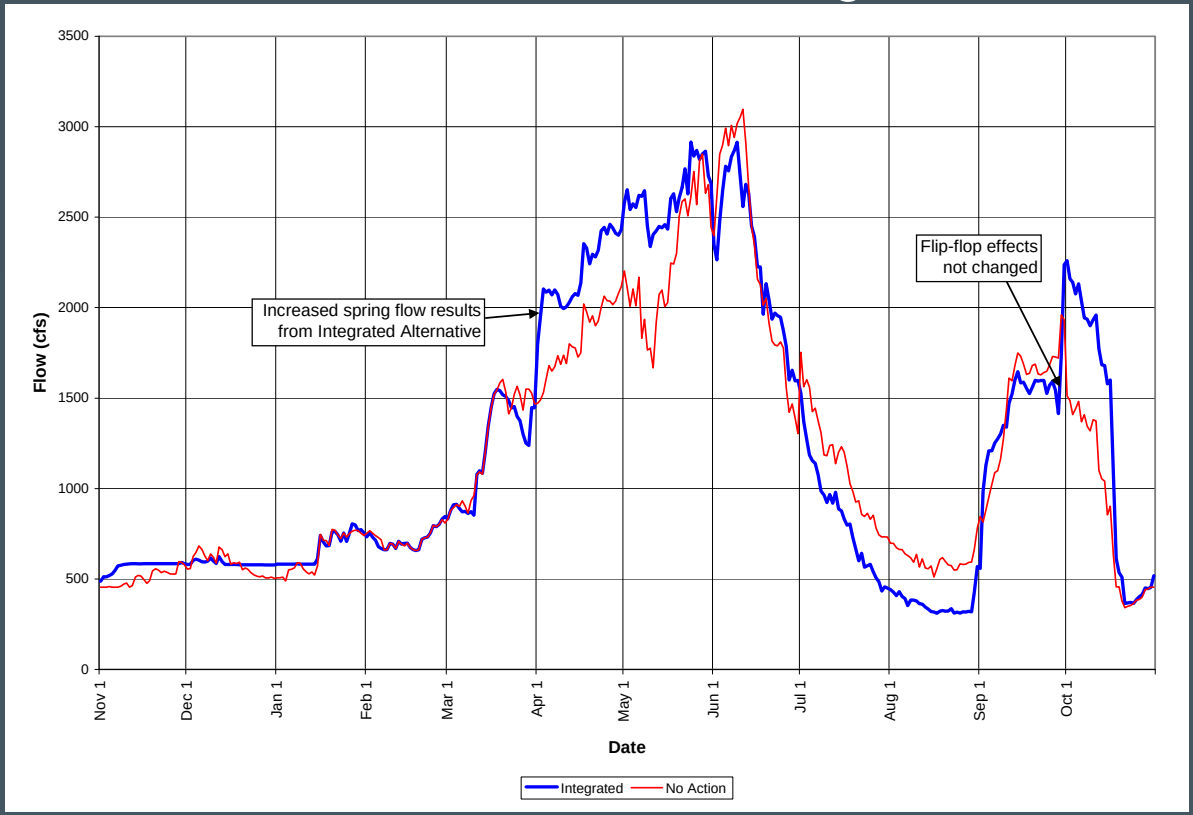
# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Naches River near Naches median flow



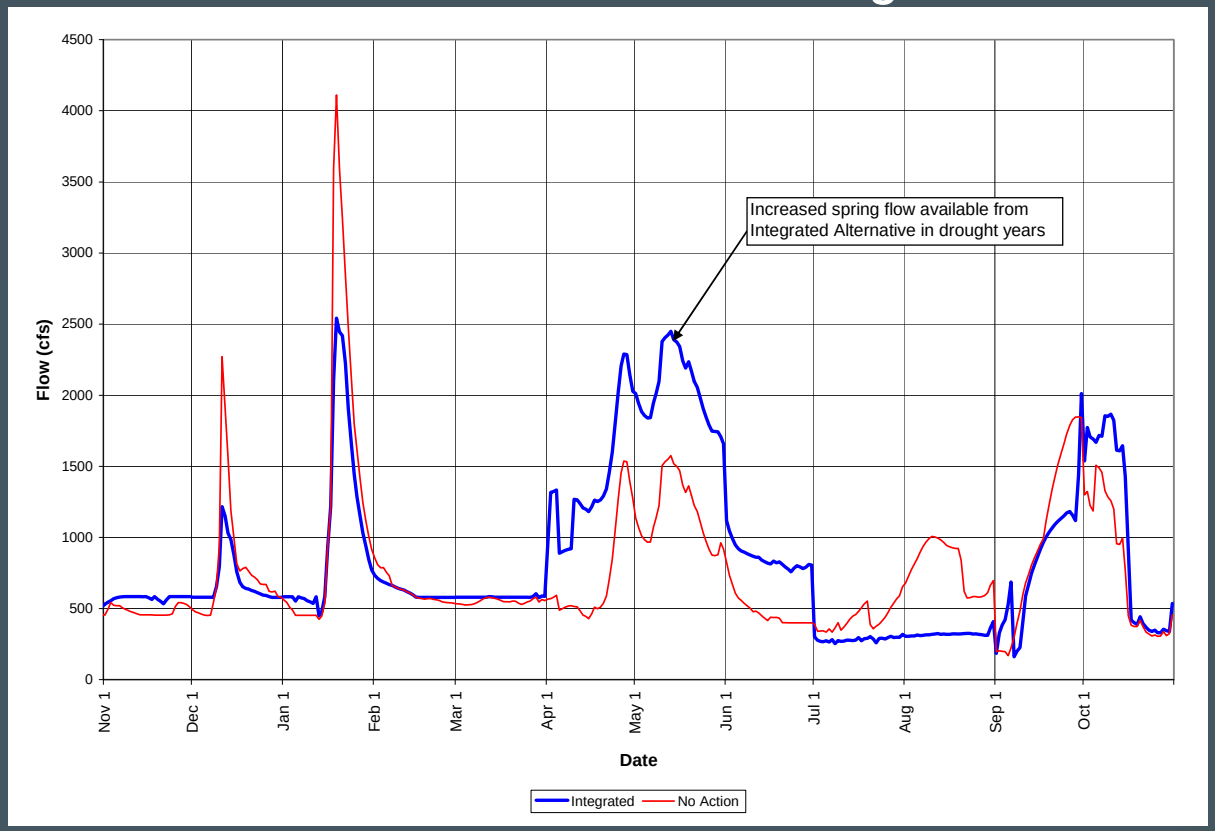
# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Naches River near Naches drought flow - 1994



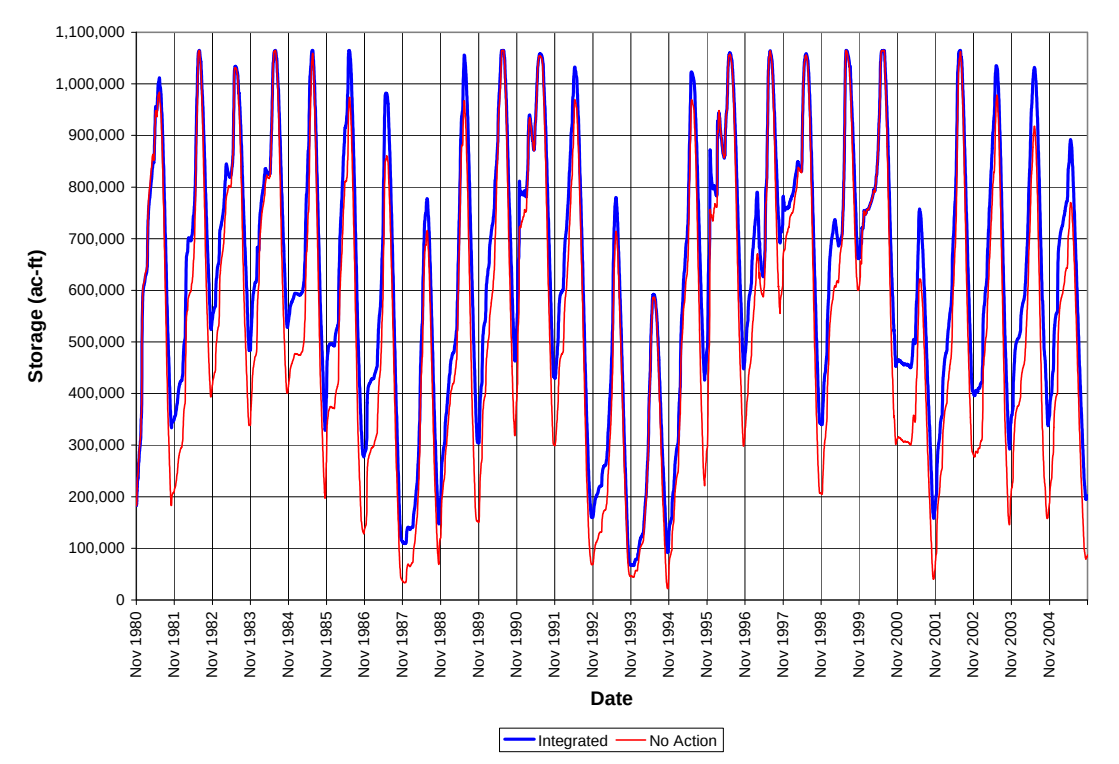
# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Naches River near Naches drought flow - 2005



# Integrated Water Resource Management Alternative

- Modeling results for combined elements
  - Existing reservoir storage volume (Keechelus, Kachess, Cle Elum, and Rimrock Reservoirs)



# Integrated Water Resource Management Alternative

- Summary of benefits for combined elements
  - Increase in water stored for additional flexibility within Yakima River basin
  - Increase in irrigation water supply and proration level
  - Decrease in summer flows for Cle Elum River &Yakima River between Thorp and Wymer
  - Increase in spring flows for Bumping, Naches River and Yakima River below Parker
  - Increase in summer flow in Yakima River below Parker
  - Increase in winter flow in Cle Elum River

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