# Oregon's Source Water Assessment and Protection

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# Agency Partners

- Department of Human Services – Health Services
  - monitoring and compliance with SDWA
  - administers the DWSRF loans with the Oregon Department of Economic and Community Development
- Dept. of Environmental Quality
  - Drinking water protection TA for PWS
  - groundwater protection and cleanup
  - watershed protection- TMDLs / Oregon Plan
- Dept. of Land Conservation and Development
  - administers statewide Goal 5 groundwater protection elements

# Oregon
# Source Water Assessments

- GW - 1003 systems (not including TNCs)
- SW - 142 systems
- Total full assessments - 1145
- TNCs 1350 systems
- Database queries (14), field locating in sensitive areas, PWS consultations
- 96 separate categories of PCSs
- As of 2/05, over 18,500 PCS have been identified

# Drinking Water Protection Process for Public Water Systems (PWS)

**Source Water ASSESSMENT phase**

**DHS and DEQ contact PWS;**
GPS intake or well and request PWS assistance

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**DELINEATION** of the source area or *"Drinking Water Protection Area"*

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**INVENTORY** for "*Potential Sources of Contamination"* per guidance

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Determine **SUSCEPTIBILITY** to contamination

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**SOURCE WATER ASSESSMENT REPORT**
**Sent to PWS**

**Drinking Water PROTECTION phase**

Activate community citizens, gather input, select a few **strategies for protecting the source area**

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*OPTIONAL: Consider writing a Drinking Water Protection Plan and gaining certification from DEQ*

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**IMPLEMENT the strategies to prevent contamination**

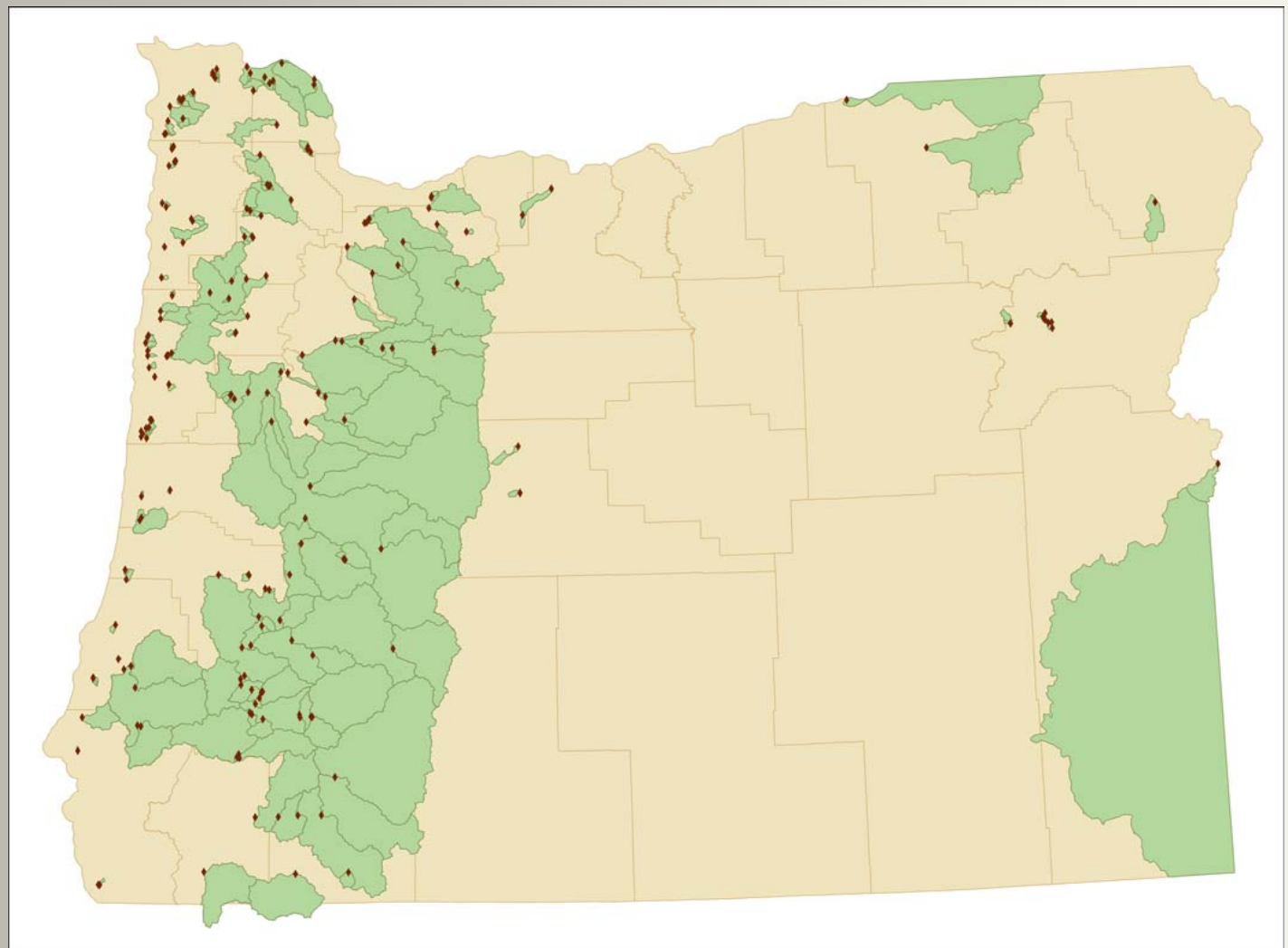
# Procedure for mapping of SW DWP Area

- Compiled base map with USGS topographic maps; edge-matched
- Used 5$^{th}$-field HUC Oregon Sub-basins to delineate watershed if available
- Completed mapping on GIS base map (up to state boundaries)

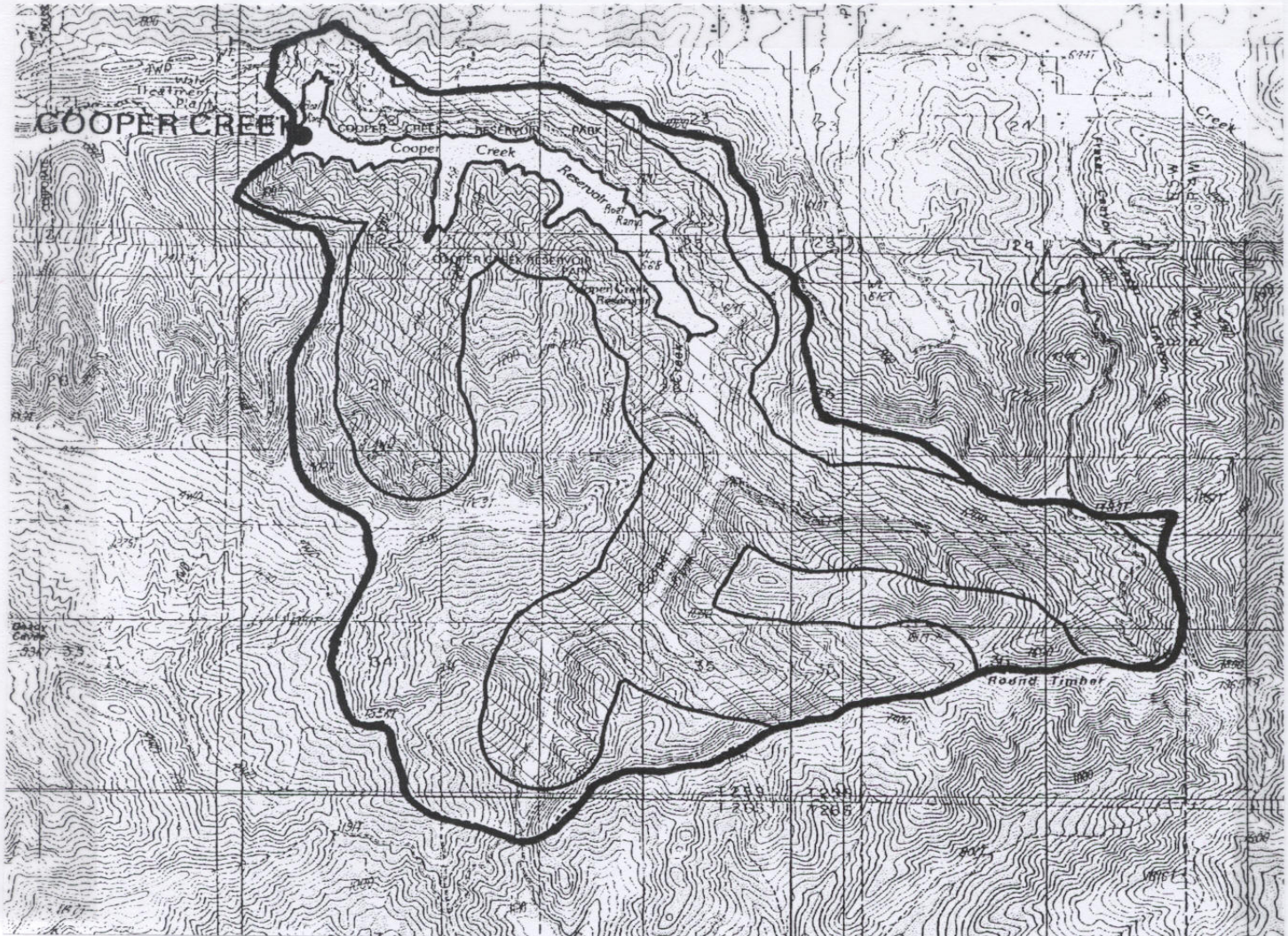
# Sensitive Areas for SW

- Why “sensitive areas” ?
  - sub-watershed area for focused inventory
  - used in susceptibility determination
- Characteristics
  - Setbacks: 1000’ from centerline of water body, includes all perennials
  - High soil erosion potential  (NRCS)
  - High permeability soils (alluvials mapped by USGS)
  - High runoff potential (Class D soils)
  - Landslide hazard areas

# Oregon drinking water source areas for surface water intakes



# *Example*
# Drinking Water Protection Area for Surface Water Intake



# Bandon’s intake

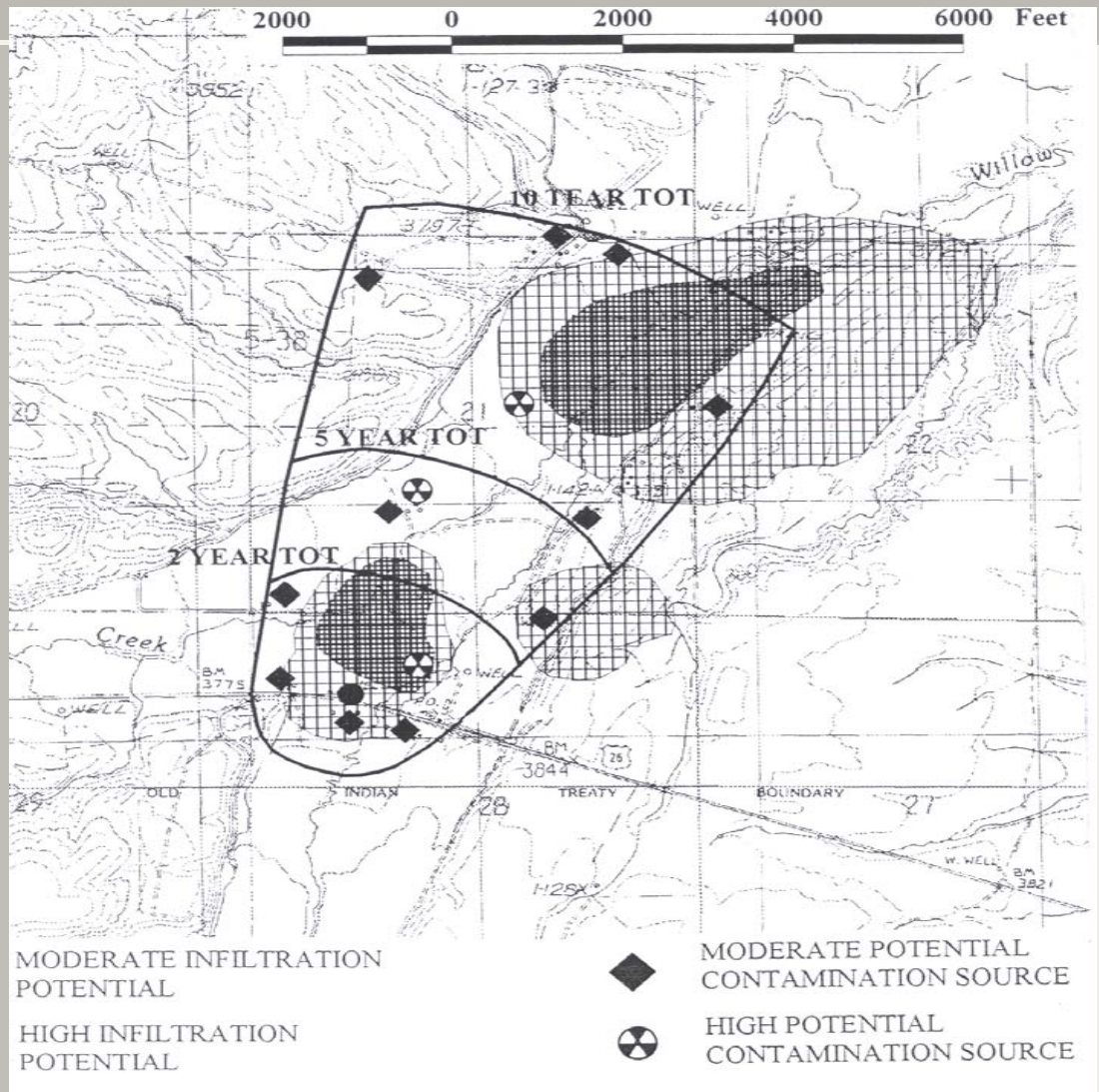
# Procedure for mapping of GW DWP Area

- < 500: calculated fixed radius around well
- 500-3300: regional conceptual model - analytical technique with researched data (well logs, reports, etc)
- 3300-50,000: site-specific conceptual model - analytical technique with field data (aquifer tests, mapped hydro. boundaries, etc)
- >50,000: numerical model

# Sensitive Areas for GW

- Aquifer sensitivity
  - Geologic environment
  - Lithology; overburden; soil types
  - Aquifer confined/unconfined
  - Infiltration potential
  - Hydraulic nature of aquifer matrix
- Well / Spring box construction & age
- Area within 2-year TOT

# Example GW delineation



# Inventory Methods

- Query 14 existing databases for permitted, located, etc, sites
- Created GIS overlay of land uses using existing layers
- Conducted a windshield survey of urban and rural developed areas and within all high risk areas
- Entered all PCSs into Access database and plotted PCSs via ArcView on delineated maps of source area

# Important points about the SWA Inventory

- listed potential sources not all inclusive
  - "contaminants of concern" = SDWA
  - potential sources = store/uses/produces levels that could contaminate PWS + sufficient likelihood of release
- not all listed sources were inventoried
  - microbes within 2-yr. TOT
  - watersheds >100 sq. miles : sensitive area focus
- not all listed sources pose actual high risk
  - worst-case assumptions for POTENTIAL
- not all inventoried sources need "managing"
  - screen out lower risks – focus only on higher ones

# Oregon's SWA Inventory Results
## Surface Water Systems
## Top 5 Highest Potential Risks

- **Managed Forests**
  - Sediments, pesticides, fertilizers
- **Crops – Irrigated**
  - Fertilizers, pesticides, sediments
- **Grazing Animals (>5 large /acre)**
  - Nitrates, bacteria, sediments
- **Above Ground Tanks**
  - Petroleum, chemicals
- **Roads – Stream Crossings**
  - Chemicals, petroleum

# Oregon's SWA Inventory Results
## Groundwater Systems (95% complete)
## Top 5 Highest Potential Risks

- **High Density Housing (>1 / .5 acre)**
  - Storm water, HHW, fertilizers, pesticides
- **Highways – Heavy Use**
  - Petroleum, chemicals, herbicides
- **Above Ground Tanks**
  - Petroleum, chemicals
- **Crops – Irrigated**
  - Fertilizers / nitrates, pesticides
- **Underground Storage Tanks**
  - Petroleum

# Elements of protecting drinking water sources

- WQ improvements = immediate fixes + long-term protection
- consider all components of water cycle: emphasize need to include GW
- include reduction of risk of loss
- balance responsibilities in protection area
  - many small changes vs. few major changes

# High Priority Public Water Systems

- Small or medium-size PWS
- CONTAMINATION RISKS
  - high soil erosion or spill potential for SW
  - unconfined aquifer with <150’ well
  - high PCS risks in close proximity
- CONTAMINATION DETECTION
  - any level of confirmed concentrations
- GW: CONSTRUCTION / INTEGRITY
  - well constructed prior to 1978

# Examples of drinking water protection components

- public awareness – CCR, sign installation
- incorporate pollution prevention concepts and BMPs for high-risk locations
- household hazardous waste education/collection
- community/watershed spill response plans
- zoning ordinances
- easements in sensitive areas –agriculture/forestry
- septic (onsite) system maintenance program
- technical training for high risk facilities' employees

# Why the need to protect?

- all surface water intakes are considered at risk
- Oregon groundwater source areas are especially vulnerable; shallow highly permeable soils, fractured basalt
- ~380 have had contaminant detections
- cost-effective to avoid loss of public water supply / expense of treatment or replacement (estimated $250,000/well; limit on new SW rights)
- protect property values and preserve economic growth potential in community by ensuring long-term clean drinking water

# “protection”…

# Why is citizen involvement so critical to drinking water protection?

- The largest percentage of pollution in Oregon comes from sources not regulated by permits, so we must engage individual citizens in the communities
- We must promote water quality protection through effective education and outreach materials
- Some of the most effective prevention tools will be individual actions by landowners and unregulated sources

# Drinking Water Protection Challenges

- Citizen concerns about pesticides (#1), monitoring frequency, drugs in water
- Citizen concerns do not translate to agency priorities
- Oregon fish priorities overwhelm drinking water issues
- It is currently easier to finance treatment than protection

# Drinking Water Protection Next Steps

- Integrate into CWA and watershed approach
- Use susceptibility results to build case for need to protect (by system, by risk)
- Develop strategy to address 5-10 highest risks for GW/SW (ex: auto repair TA, spill response grants, homeowner outreach)
- Transfer data lists of specific high risk PCS to other programs for prioritization (ex: tanks, WWTP, ODF-private forestlands)

# A healthy watershed means healthy drinking water