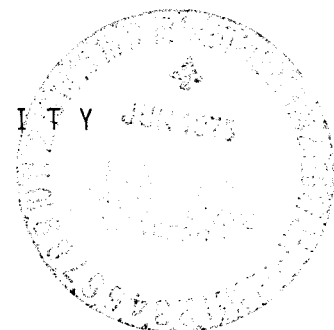


Oregon's Environment



OREGON STATE UNIVERSITY

May 1975



Number 23

Field Burning Problems Not Unique to Oregon

Rice growers and grass seed growers have much in common. They both have problems with burning the straw residue. Recently, in California, the Air Resources Board developed a series of proposals for consideration by the state's 125 (approximate) rice growers. The essential aspects of the control plan include:

1. Limit the amount of acreage burned per day depending on the ability of the atmosphere to disperse the smoke.
2. Restrict the time of day burning could take place--preferably between noon and 5 p.m.
3. Divide the burning between Fall and Spring months to distribute more evenly its impact on air quality.
4. The Board estimates that 37% of the amount to be burned could be done in the Fall; an additional 20% in the Winter; and the balance in the Spring.
5. Specific burning techniques, such as backfiring and striplighting will be used, and all straw burned should be spread rather than left in wind-rows.

Although rice growing is a year round operation, most burning of straw waste takes place from late September to early November. In 1974, a total of 467 thousand tons of straw were burned in October and 256 thousand tons were burned in November. This compared with an average of 90 thousand tons per month during the Spring, and almost no burning in the Summer.

(From the California Air Resources Board Bulletin, Sacramento, California, May 1975.)

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Donate old magazines, books, and clothing to groups like the Salvation Army or Goodwill Industries... someone needs them.

The Water Shortage

There are those in government who believe that the energy crisis is only the prelude to a national and world water shortage that could prove catastrophic unless the resource gets far better management than it has received so far. The amount of food that can be grown is limited by the amount of available water. Energy development of fossil resources, such as coal and shale, are directly dependent upon water supplies. And water, like everything else, is getting more expensive, even where it is available in large quantities.

The Water Resources Conference, an organization made up of state and national leaders, has issued a warning that as energy development is increased the nation faces a "water crisis" in the 1980's. Water management and development have moved far too slowly, the conference reported. The report found that the United States must develop seven million acre-feet of water above its present resources just to meet the increased energy demands. The situation is the most critical west of the Mississippi River where fossil fuel projects will require vast amounts of water in arid regions.

Even in states with heavy rainfall, such as Oregon and Washington, water use and distribution are far from satisfactory. In Washington, there is a backlog of 3,700 water permit requests, involving 200,000 acres, that have piled up since Gov. Dan Evans sought a water bill that would have set fees, time limits and recreational requirements for large irrigation projects. The increased use of water for irrigation (one company, U&I Sugar, alone is seeking water permits to irrigate 53,000 acres on the Horse Heaven Plateau) is snowballing, causing in some areas a reduction of the water table and drawing down the wells of many irrigated areas.

The Oregon Legislative Joint Interim Committee on the Environment, Agriculture and Natural Resources drew up SJR 2 that would establish a joint interim committee to study and review the state's water statutes and its capability to plan, develop and manage its water resources. The Pacific Northwest River Basins Commission has been developing a comprehensive plan for the Pacific Northwest and is making use of plans prepared by the states and various federal agencies.

The National Water Commission, headed by Charles F. Luce and having Howell Appling, Jr., of Oregon as a member, has issued a massive report to the President, seeking to identify water problems in the West and offering a long-range plan. But despite these efforts, and those of Oregon, the tons of books and papers discussing energy, natural resources and land use planning hardly give a glancing blow at the water problems of the nation. Until the nation gets as concerned about water as it is about oil, the crisis in water won't be apprehended until it arrives. (An editorial in the daily Oregonian issue of April 29, 1975.)

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The Willamette River, with an average rate of flow of 30,700 cfs, is tenth on the list of rivers in the United States with the highest flow. Ranking third on the list is the Columbia at 235,000 cfs, below the Ohio and the Mississippi.

Lake Tahoe Sewerage Systems

Statistical analysis indicates that wastewater infrastructure projects have had a significant influence on the land use pattern in the Lake Tahoe Basin. Land use densities have increased immediately following the expansion of plant capacities in areas serviced by three of the four major wastewater treatment facilities. The subdivision approval rate of raw land was also found to be a function of anticipated treatment capacity. Federal and state water quality agencies played an active and central role in wastewater management programs designed to remove the threat of water pollution at Lake Tahoe.

Cooperation among all levels of government led to expeditious resolution of the water quality problem in spite of the numerous geographic, economic and political constraints in the region. However, the provision of sewerage facilities also removed land development constraints. Local governments, acting without coordinated land use policies, permitted intensive land uses which could not have occurred with septic tank treatment. These increases in land use have subsequently produced major environmental problems in the Tahoe Basin. Thus the singular focus on water quality led to unforeseen environmental impacts resulting from the land use changes made possible by the provision of extensive sewerage systems.

From "*Influences of Wastewater Management on Land Use: Tahoe Basin 1950-1972*". EPA-600/5-74-019, October 1974. EPA, Wash, D.C. 20460.)

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Use local recycling centers. If there are none in your community, work for their establishment.

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Air Pollution in Forests

Concern for the air resource in making decisions about prescribed burning of forest residue should be only one of many concerns for the various resources and factors that comprise the forest environment. The most important air quality emergency from forest emissions and one that must be aggressively prevented comes from the catastrophic fire with its destruction of all forest resources with long-lasting effects.

The small prescribed burns, designed expressly to prevent catastrophic fires, can be scheduled during weather conditions that assure smoke dispersal with minimum effect on air quality, particularly in smoke-sensitive areas. Indeed, extra effort should be made to remove excessive fuels under favorable dispersion conditions; fuel accumulation increases the likelihood of a conflagration and attendant extreme smoke conditions.

Existing air quality regulations designed for metropolitan area problems are not generally applicable to the usually remote, higher elevation residue reduction fires that often have sufficient energy to place their smoke plumes far above the layers of atmosphere that come in contact with the surface. Smoke behavior and dispersion depend on weather which is changeable and provides a great variety of dispersion conditions.

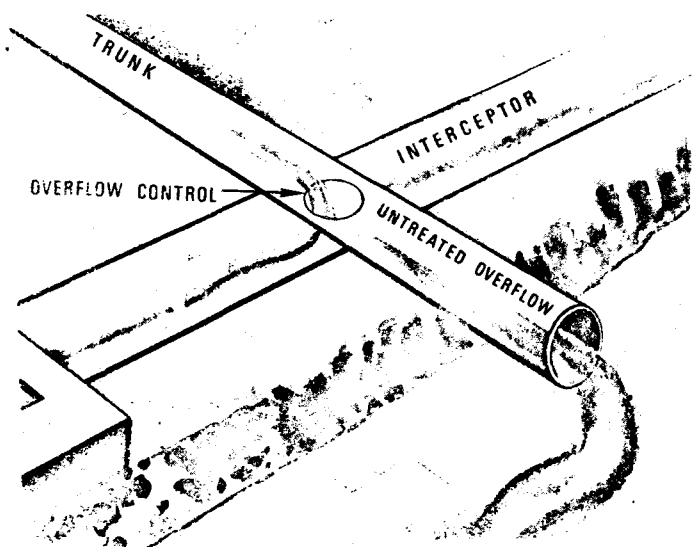
Smoke management systems intensively using available fire-weather information match the dispersion condition to the burning job, hence can accommodate a considerable amount of prescribed burning without serious effect on air quality. Each prescribed burn should be considered on its merits with respect to convective rise, plume trajectory, elevation, and air quality impacts as well as from the standpoint of effects of the burn and alternative treatments on related resources.

Sewers Determine Growth Pattern

The location and rate of extension of interceptor sewer lines through previously undeveloped areas seem to have more impact on land use than any other set of decisions on wastewater facilities. Interceptor sewers are defined as the major lines that run from the collector sewers to the treatment plant. Because the location of a new interceptor significantly increases the number of buildable lots along its right of way, a key issue is its capacity. There is a general tendency for such lines to be oversized in order to assure the necessary capacity for future development, but the oversizing itself can contribute to the extent of development that occurs. Such oversizing thus becomes a self-fulfilling prophecy.

A related land use impact caused by large interceptor sewers is their tendency to be designed to run for long distances between existing towns before reaching the treatment plant. Such lines open up large areas of what may have been previously undeveloped land between the towns. While this may be in line with overall regional land use planning, it could also run counter to desirable development patterns, particularly if sewers are placed only with an eye toward wastewater treatment efficiency.

In one recent case, a proposed interceptor was slated to run through a large undeveloped coastal area of Delaware that was on the state plan for eventual purchase as recreational land. The proposal would have used public funds to build a sewer that would have substantially raised the purchase cost of the land to the public.



Another phenomenon related to the construction of large interceptors is the tendency for developers to move immediately to the end of the new line in order to take advantage of both the available sewer service and the low land costs on the far urban fringe. The result is a costly leapfrog and fill-in development pattern, which increases the difficulty of properly planning the timing and size of other public facilities and spreads the urban area out in a pattern that is wasteful of land and energy resources.

Many of these problems could be avoided if the construction of major interceptor sewers were phased to the extent feasible to coordinate with the extension of other public facilities in accord with a comprehensive land use plan. While annual or biennial extensions of such interceptors might make the sewer cost somewhat higher and the funding mechanism more complicated, it would probably result in overall cost savings to the community and would significantly reduce adverse land use impacts.

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Similar issues arise when the analysis shifts from an individual interceptor to the design of an entire wastewater treatment system, including the treatment plant. Once again, cost factors favor the choice of large regional treatment plants with associated sewers. So far as water quality is concerned, these systems present economies of scale in construction and operation and require less monitoring and fewer highly trained personnel than a number of smaller treatment plants. But, as with sewers, the overdesign of capacity in the regional plant becomes a self-fulfilling prophecy.

Coastal and other areas of seasonal home construction may be particularly affected because only a limited amount of land may be available for high density development, and because the potential buyer of a seasonal home or a recreational lot has greater freedom of locational choice than with his primary home. While a series of smaller but individually expandable plants might be more costly in such circumstances, the community could retain more control over development. Such a course would also give communities broader options to coordinate the expansion of wastewater treatment facilities with other public service programs. It is important to assure that such options are considered and the potential land use impacts are recognized prior to Federal funding.

(From "the fifth annual report of the council on environmental quality". December 1974. U.S. Government Printing Office, Wash., D.C., 20402. Price: \$5.20.)

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Guide for Coastal Planning

Under the sponsorship of the NOAA Office of Coastal Zone Management, the Coastal Zone Management Institute has recently compiled and published a report which is intended to serve as a technical guide to state and local officials involved in the development and implementation of coastal zone management programs. This document should be useful as a reference to a broad audience, including government officials, the academic community, special interest groups, and the general public.

Entitled *Coastal Zone Management: The Process of Program Development*, the report deals at length with the requirements of the Federal Coastal Zone Management Act of 1972 and offers a substantive analysis of the key factors involved in formulating statewide programs in coastal zone management. It also offers extensive bibliographic listings of information available

pertinent to coastal zone matters, and includes copies of the Federal Act and of the rules and regulations promulgated under various sections of the Act.

Copies of the report may be obtained at a cost of \$7.50 each if prepaid and \$9.00 each if billed, from the Coastal Zone Management Institute, P. O. Box 221, Sandwich, Massachusetts 02563.

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OPERATE THE KITCHEN RANGE FOR PEAK EFFICIENCY. Well-designed cookware, used on the proper settings, helps to conserve energy. Never use the range as a space heater.

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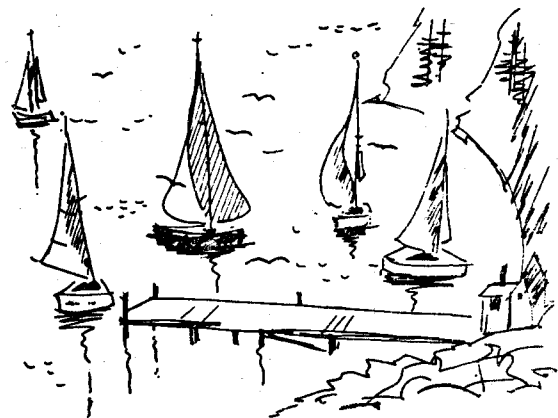
Public Dollars and Tourists

The economic impact on the Douglas County economy of visitor expenditures attributable to public investments in the Lower Umpqua River area for small-boat facilities and for county and state parks is estimated at \$5.4 million annually. These impacts accrue, but not equally, to most businesses of the county economy. The activities most affected include retail and wholesale trade, retail services and organizations, households, service stations, and automotive sales and services. Probably one of the most important impacts occur in households where approximately \$570,000 of gross wages and salaries are directly attributable to small-boat facilities and county and state park investments in the Lower Umpqua River area.

These are some of the conclusions reached in a study completed by Wilson E. Schmisser and Russell C. Youmans, OSU agricultural economists and William Boedt, U.S. Army Corps of Engineers. Public investments of particular concern in this study include a boat turning basin and small boat moorages at Salmon Harbor, a river channel to Reedsport with side channels serving Salmon Harbor at Winchester Bay, Scholfield Creek in Reedsport, and Gardiner, entrance jetties and channel at the Umpqua River mouth, Windy Cove County Park, Umpqua Lighthouse State Park, and Ziolkowski Beach. It was concluded that recreation and tourism is an important basic industry of the Lower Umpqua River area. Approximately 32 percent of the gross sales of the area's recreation related businesses were derived from visitors who include both tourists and recreationalists. Approximately 52 percent of the 254 individual businesses and firms located in the Lower Umpqua River area reported significant sales to visitors during 1972.

Total visitor expenditures during the year were estimated at about \$6.7 million. Grocery stores, automotive sales and service, and gasoline service stations were major recipients of visitor expenditures. They directly received about \$4.9 million, or 73 percent of the area's total visitor expenditure.

(From *"Economic Impact of Public Investments in Small-Boat Facilities and State Parks in the Lower Umpqua River Area of Douglas County, Oregon"*. WRRI-30, March 1975, Oregon State University.)



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Honey bees are being studied as valuable indicators of pollution stress. Specimens are exposed to various pollutants and an analysis made of the effects on physiology, behavior and productivity.

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Water Sampler Plans

The primary water-quality problem facing agriculture is to identify potential sources of water pollution, such as sediment, pesticides, and nutrients contained in fertilizer and manure, which leave farms in runoff water. Some of these substances may change rapidly with time or with variations in temperature, and it is therefore necessary to collect, refrigerate, and analyze water samples on a timely basis. Since runoff events cannot be accurately predicted, it is necessary to have automatic sampling equipment.

The USDA has developed a model to satisfy the need for a relatively small, inexpensive, versatile, and easily maintained unit. It is designed to take samples automatically for delivery to existing refrigeration units. The construction was undertaken because the USDA discovered that most existing samplers are too large or too expensive.

Two samplers were tested during 13 runoff events, each lasting 1 to 3 days, at the Agricultural Research Service's Watershed Research Center, Chickasha, Okla., and only minor problems arose. Samples collected with this sampler were well correlated with samples collected by the Federal Inter-Agency Sedimentation Project PS-66 samplers that were also installed at the sampling sites.

The cost of the basic sampler, excluding labor, is approximately \$225. Fabrication, assembly, and testing require approximately 50 man-hours. Installation time varies with complexity of installation type.

(From "An Inexpensive Automatic Water Sampler". ARS-S-50, March 1975. ARS, USDA, Durant, Oklahoma 74701.)

Ground Water Law

Eastern Colorado has a ground water problem more acute than that in eastern Oregon. It began in the late 1950's and early 1960's when water levels began to decline because of extensive irrigation wells.

In 1965, Colorado passed what is known as the "Ground Water Law." Among other things, this law created the Colorado Ground Water Commission and delegated to the State Engineer the authority to administer well permits. The Ground Water Commission was given the authority to create designated ground water basins in areas where critical ground water problems existed.

With water levels dropping, the Ground Water Commission ordered the creation of the High Plains Designated Ground Water Basin. A Ground Water Management District was set up to administer the designated basin on a local level. This Management District consisted of local farmers, businessmen and interested citizens.

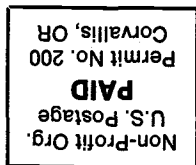
The creation of the High Plains District led to the enactment of ground water rules and regulations to curtail the water level declines. Among these rules and regulations were:

1. One-half mile spacing between wells.
2. Regulation of production, including required water meters.
3. The establishment of the no-additional-irrigation-well rule in areas where major water level declines had occurred.
4. Requirement of permits for all wells drilled in the High Plains Basin.

It was within this framework that the Burlington wells were drilled. All permits were granted as replacement permits for the old sand-pumping wells. Upon completion of the wells, a Well Completion Report was required of the driller and a Beneficial Use Statement required of the city.

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All test holes were plugged as specified by the Management District to prevent contamination of the aquifer. Water meters were required on the permanent pumps. Production rates were restricted to those specified on the original permits.

The formulation of the designated basin has not entirely solved the ground water problem in eastern Colorado. In some areas, water levels still continue to decline at a rate of about 2 ft. per year. Water quality is deteriorating, reflecting the closed system of ground water extraction and irrigation return. The present projection is 40 per cent ground water depletion in 25 years. This would render the shallower wells and wells of low specific capacity uneconomical for irrigation.

The Ogallala formation in eastern Colorado presents a problem which is occurring in many aquifers throughout the United States. The Colorado legal controls curtailed the uncontrolled pumping of ground water and extended the life of an aquifer which presently would have been exhausted without these constraints.

(From "*The Johnson Drillers Journal*", March-April 1975.)

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EDITOR'S NOTE:

There will be no newsletters for the months of June, July and August. Publication will resume in September.