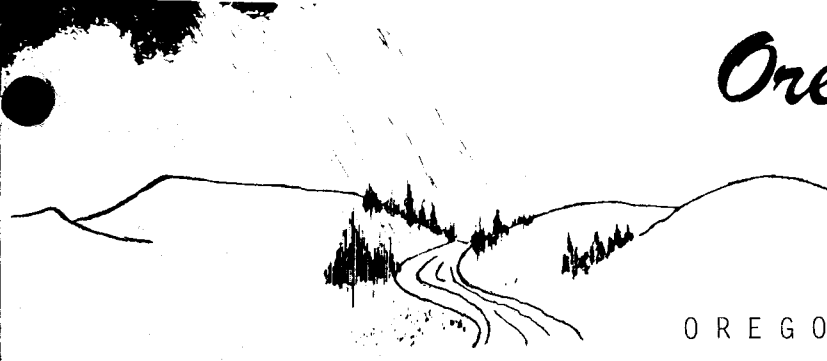


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Oregon's Environment



OREGON STATE UNIVERSITY

November 1974

Number 18

COASTAL COMPROMISES

Members of the Oregon Coastal Conservation and Development Commission (OCC&DC) are striving to hammer out a management program or plan. It must be completed by January of 1975 and submitted to the Land Conservation and Development Commission (LCDC) and to the Legislature for appropriate actions to carry out the program.

It is not an easy task. There is the age-old question of which level of government will make the decisions. A lot of dedicated people at OCC&DC are working on this with the help of concerned private citizens and interest groups. Compromise is the name of the game when you have to consider the needs and desires of seven counties, 34 incorporated cities and 15 port districts. In addition, there are almost 200 special districts in the 8,000 square miles of coastal zone which levy taxes and influence management of natural resources.

Beginning on January 1, 1975, all of these cities, special districts, counties, state agencies, and quite possibly federal agencies, too, will be required to formulate land use plans to comply with goals set by LCDC. Hopefully, what OCC&DC produces can be translated by LCDC into requirements which are meaningful for the coastal area.

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MOBILE AIR MONITORING

A mobile air sampling laboratory was put into operation last month by the Mid-Willamette Valley Air Pollution Authority. It includes a trailer to house initial equipment of a carbon monoxide monitor, an ozone monitor, and wind system. The lab will be used to supply detailed analysis of specific areas in five counties. Future equipment addition plans include a sulfur dioxide monitor, hydrocarbon analyzer and an oxides of nitrogen analyzer.

EVALUATE SMALL APPLIANCES

Small electric luxuries can make life easier and more pleasant if they're really needed. To a person with arthritic hands, an electric can opener or an electric toothbrush may be a necessity. But for most of us, these are energy-consuming luxuries. In the kitchen, small appliances such as electric coffeemakers and broilers often do the job with less energy than the range since they are thermostatically controlled and can be set for the amount of heat needed.

A DEVICE FOR MANAGING COMBINED SEWER OUTFLOWS

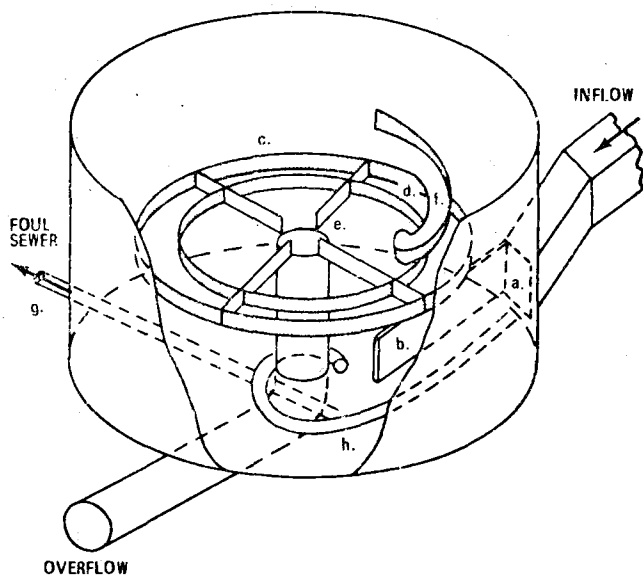
An improved model of a "swirl regulator/concentrator" has been developed by EPA for use in sewers which carry both stormwater and municipal sewage. A regulator is generally required, during periods of wet weather, to separate the flow to prevent overloading the treatment plant. Too often, the combined sewage that cannot be accommodated by the downstream intercepting sewer or treatment plant is bypassed by the regulator directly to the receiving waters, resulting in heavy wet-weather pollution loads.

A demonstration swirl device in operation at Syracuse, New York is 12 ft. in diameter and 3 ft. to the top of the weir. Its total cost is about \$65,000.

The swirl device regulates flows by a central circular weir, which is a modification of a common static flow regulator. During normal operation, it separates solids by means of the swirl action described above. Floatables are separated

from the overflow by a trap located near the weir. During low dry weather flows, the sewage is guided along a groove in the bottom and goes directly to the interceptor, which conveys it to the treatment plant.

During higher-flow storm conditions, the low-volume high-solids concentrate resulting from the swirl action is diverted via an outlet at the end of the bottom groove to the interceptor, and the clear, high-volume supernatant overflows the central circular weir. This liquid can be further treated and discharged into the receiving waters, or, depending on quality requirements, directly discharged into the receiving waters. Provisions can also be made for storage and subsequent pumping of this relatively clear liquid to the sanitary sewage treatment plant during low-flow, dry-weather periods. This method thus allows the maximum treatment possible but still protects the treatment plant from overloading. Such a system makes primary treatment possible at all times and prevents raw combined sewage from being passed directly to the receiving waters during periods of heavy flow, according to EPA.



Isometric View of Swirl Regulator/Concentrator. Legend: a, Inlet Ramp; b, Flow Deflector; c, Scum Ring; d, Overflow Weir and Weir Plate; e, Spoilers; f, Floatables Trap; g, Foul Sewer Outlet; h, Floor Gutters.

It is claimed that the dual-functioning swirl unit is the first regulator device of its type in this country to offer the basic advantage of simultaneously controlling the quantity and quality of combined sewer overflows. It is classified as a simple and practical facility that can effectively reduce significant portions of grit, settleable solids, and floatables over a wide range of varying overflow rates.

(From a newsletter dated October 25, 1974, issued by the NERC, Cincinnati, Ohio, 45268.)

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Cigarette smoking is dangerous to your health...and a source of pollution.

LAND USE POLICY TECHNIQUES

In April of this year, the American Assembly met in Harriman, New York to discuss "Land Use in America" and after three days of discussion issued a report. The Assembly is a national, non-partisan educational institution which takes no stand on the subjects it presents for public discussion. Here are the conclusions of the 77 participants, from diverse occupations, regarding land use policy techniques:

1. Tax -- federal

The federal tax system, which already affects real estate investment decisions in a variety of random ways, is a largely unreliable vehicle for land-use policy-making. It should be subordinated in favor of other more direct land-use policy tools. Where existing federal tax preferences have adverse land-use effects, they should be reviewed and revised.

2. Tax -- state and local

The state and local property tax structure has a substantial direct effect on land use. Better assessment practices are needed more promptly to reflect changes in market value. We recommend controlled experiments with the following:

- a. In urban areas, shifting the base of the property tax from both land and buildings to heavier taxation of land as against buildings, or to land only, as an incentive for better land use.
- b. Decreased reliance on local property taxes to support local government and schools, with greater reliance on metropolitan or statewide taxes, to alleviate the adverse impact of local tax inequalities on land use.

3. Urban Revitalization

Disillusion with solutions of the 1950's and 1960's should not divert the American people from a fundamental task: it is to revitalize the nation's inner cities. Such revitalization requires that it be a priority, coupled with substantial financial assistance for the following:

- a. Redevelopment and improved use of blighted central city and inner suburban land and buildings.
- b. Further imaginative experimentation with rehabilitation of existing structures--including experimentation with "urban homesteading."
- c. The infusion of more services in central cities to attack social and economic problems, with special emphasis on minority groups and other socio-economically disadvantaged individuals.
- d. Fiscal strengthening of the central cities through metropolitan area or state revenue sharing and direct aid from the federal government.
- e. Public policies to encourage private market pressure to revitalize central cities, including their socio-economic mix.
- f. Good land-use planning to include the retention and encouragement of minority and small businesses.

4. Rural Revitalization

Attention should be given to investment, tax, and regulatory measures affecting the conservation and development of the resources of rural areas used for the benefit of both rural and urban people. This development will include, for example, better housing and community facilities; expanded production of food and fiber; conservation and improvement of forests, watersheds, and recreation areas; and reclamation of strip-mine areas.

5. Transportation

Too often have the planning and placement of transportation facilities contributed to urban sprawl and the decay of critical cities. Therefore, all transportation planning and implementation should be integrated with plans for land use. In particular, subsidies for public transportation and pedestrian movement should be increased and subsidies for the private automobile reduced.

6. Housing

All metropolitan area land-use plans must include sites for adequate stocks of housing for all income groups located in relation to job opportunities, environmental concerns, transportation, and other public and private facilities.

7. Land Banking

"Land banking" -- the stockpiling, by governmental or quasi-governmental units, of land purchased at reasonable prices from private owners--should be utilized to assemble park, school, and other sites for public use. Land banking experiments are needed in governmental ownership of land for the purpose of strengthening the capacity to do effective comprehensive land-use planning and otherwise promoting good land-use practices. Such experiments should comprehend government acquisition of land which in the main would be sold or leased to private interests to farm or to develop in accordance with the public interest. They should be undertaken to determine the feasibility of land banking to hold down excessive inflation of land prices, to derive community-wide benefits from land price inflation, and in general to promote good land-use practices.

Donations of private land for public open space should be encouraged.

Some extension of eminent domain to allow a private developer to deal with the hold-outs under careful restriction is desirable.

8. Windfalls -- Wipeouts

The actions of government can lead to windfall profits for some property owners and wipeout losses to others. If present theoretical studies of windfall recapture and wipeout avoidance techniques are favorable, leading techniques should be subject to actual experiments. These experiments might well include "transferable development rights." Under that concept the severely restricted land owner can be permitted to transfer rights to develop to other less restricted land or to sell such rights to others for use on such land. Basic to this concept is the recognition of a separation of present use rights of land and the rights to its future development.

9. Environmental Protection

States must adopt methods for assessing the economic, social, and environmental impacts of substantial public and private land-use decisions, such that both costs and benefits can be determined in a timely and equitable manner.

In this connection, states should consider the adoption of environmental impact study requirements for land development similar to those contained in the National Environmental Policy Act. Appropriate regulatory action at all levels of government is essential to prevent further environmental damage and abate existing problems expeditiously.

Special steps should be taken immediately to protect areas of critical environmental importance from damage by ill-advised development.

Management of federal lands should be improved through comprehensive planning. They should be protected from environmental damage that might result from such lease activities as over-grazing, over-logging, and ill-advised surface mining. Stringent standards of reclamation for severe disturbance from surface mining and other development on all lands should be required by law. Further, policies to improve the management practices for federal lands must assure coordination of federal with state, regional, and local land-use policies and plans.

* * * * *

REUSE OF MUNICIPAL WASTEWATER

A study was made at Texas Tech University to investigate the feasibility of using, for recreational purposes, treated municipal sewage that had percolated into the underlying formation. Experimental ponds were set up and fish were used to determine the effect on reproduction of a fish resource.

The following tentative conclusions and specific recommendations are based on results obtained thus far in the project:

1. It is concluded that treated municipal wastewater that has been reused for irrigation and has percolated into the underlying aquifer is a suitable source of make-up water for recreational lakes to be used for all purposes, including primary contact recreation. It is recommended that the research be continued in an effort to find a predictive technique that would enable the manager of such a facility to anticipate approaching problems such as algal blooms and to take corrective measures before the problem becomes serious.

2. It is concluded that fairly sophisticated management techniques will be required to maintain the lakes in an aesthetically pleasing

condition at all times. It is recommended that any organization contemplating developing such a source of recreational water employ a competent manager with full-time responsibility for maintaining quality in the lakes. Such a person will need access to a well-equipped laboratory and will need to be decisive enough to take independent action to control algal blooms or other undesirable plant growth before they become aesthetic problems.

3. It is concluded that such reclaimed water will support a wide variety of fish life. It is recommended that further study be given to the possibility of controlling algae and other aquatic plant growth by means of fish such as the Tilapia. This might require the operation of a separate hatchery for such fish, since it is understood that bass or other game fish can control the population of Tilapia very effectively. These fish are not forbidden for release in waters in Texas, but may be elsewhere.

(*"Recreational Reuse of Municipal Wastewater"*, WRC-74-3, August 1974, Water Resources Center, Texas Tech University, Lubbock, Texas.)

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Don't accept paper bags for items small enough to fit in your purse or pocket.

GLOBAL AIR POLLUTION AND CLIMATE

Of the many urban air pollutants, only two classes seem capable of affecting climate -- at least on a large scale. These are CO₂ and fine particles. CO₂ is a ubiquitous result of fossil fuel combustion and in the past century the atmospheric concentration has increased by more than 10%. Fine particles result from pollutant sources in two ways --- as direct particulate emissions and as the emission of gases that participate in particle-forming reactions in the atmosphere. Some of these reactions are those producing sulfates from SO₂, nitrates from NO₂, and an ill-defined mixture from photochemical smog components relating to hydrocarbons, nitrogen oxides, and SO₂.

With regard to climate, it is noted that there has always been climatic change, but we are concerned with avoidable changes due to pollutant effects. Pollutant effects and thus the pollutants that might effect a climatic shift are those that might change the radiation regime or the precipitation cycle. With regard to the latter there is some evidence of local urban increases in precipitation under certain fairly special conditions. Precipitation changes could most logically be attributed to fine particles of specific chemical constituents. It is likely that any observed local situation that got out of hand could be readily controlled at the pollutant source after the causative agent was identified. Precipitation effects remote from the source seem unlikely.

Climatic change, inadvertent change that is, by radiation - balance shifts is possible with either CO₂ because of infrared absorption, or fine particles because of combined absorption and scattering effects. The lead-off or at least initial characteristic of a radiational climatic change is not global heating or cooling --- although this is the popular conception.

The initial radiational impact should be expected to be an alteration in the equator-to-pole temperature gradient and then a resultant shift in the major weather tracks, storminess, precipitation, etc. This results from the fact that the atmosphere responds as a heat engine running on the difference in temperature between the tropics and the poles. Radiation impacts, because they are dependent on solar energy, will cause more temperature change in the tropics because it is a high solar radiation energy area. This is especially true of CO₂ which has mixed globally and could be effective in altering tropical conditions.

Fine particles, on the other hand, may have a much more limited impact area because of an atmospheric residence time of 1 to 2 weeks and a limited emission zone in the mid-latitudes of the northern hemisphere. In the northern latitudes, because of the lower sun angle any effects of increased particles may be amplified and lead also to a greater temperature difference between the equator and the pole.

While we can speculate currently about inadvertent climatic change, the climate seems to be undergoing another period of change due to a presently undefined combination of natural factors. The change is toward a cooler climate on a global scale. The most notable result however may be a shift in storm patterns. The role of air pollutants in this shift over the past 20 years does not appear to be detectable but it might be a factor in combination with natural factors.

One final remark --- although air pollutant emissions may not be altering our global climate this is no excuse for relaxing our efforts at cleaning up our air pollutant emissions. The air pollution problems that are present close to home and clearly evident are reason enough to pursue an active campaign of regulation and control.

(This is a summary of remarks made by Elmer Robinson, Professor, Environmental Engineering, Washington State University, at a seminar conducted on the OSU campus this month.)

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MEASURING THE SNOWPACK

A device for measuring the important factors in a snowpack has been installed in California, as a joint project of the Bureau of Reclamation and staff members of the University of California at Davis. The result of their efforts is the world's largest and most sophisticated "Snow-melt Lysimeter".

Measuring 10 feet wide, 12 feet long, and 22 feet high, the steel and aluminum lysimeter was installed at the U.S. Forest Service Snow Laboratory near Norden, California, in late 1973. It consists of two large buckets within the one common container, separating two volumes of snow from each other and from the surrounding snowpack. The two volumes of snow, one treated and the other untreated, will be used to compare available melt waters.

At the beginning of the snow season, the lysimeter shell is retracted completely into an underground pit excavated in the solid rock. Thus, during the snow season, the shell is raised and lowered as the snowpack accumulates and recedes, and is always maintained just below the snow surface. If one container of snow melts faster than the other, the movable bottom in that part of the lysimeter is raised to return the snow surface to the proper level.

Most of the sophisticated electro-mechanical equipment to accomplish the movements, and the necessary

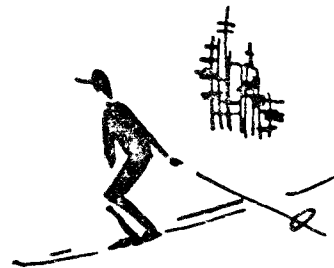
framing and supports, are underground. The only feature normally conspicuous above ground is the access tower. This tower and its access tube, or tunnel, provide year-round access to the underground equipment.

Instrumentation is now being completed for measuring snow density, melt water, lysimeter position, snow temperatures, and other snow parameters. Data obtained will go directly from the instrumentation to a computer for recording, processing, and printout.

Observation of the lysimeter and operation of its mechanical features last snow season have given an understanding of interactions between it and the snowpack. On that basis an operating procedure for the system has been developed. Now, with a new snow season approaching, this unique test facility should be ready to evaluate suppressants for reducing snowpack losses and retaining the maximum amount of water for uses downstream.

(From "Research News", Vol. 4, October 1974, No. 4, Bureau of Reclamation, P. O. Box 25007, Denver, CO 80225.)

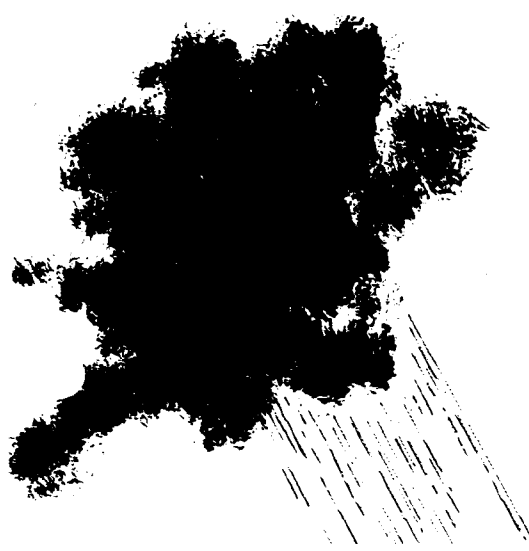
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FUTURE POLLUTION PROBLEMS

Future pollution problems have been analyzed and ranked in order of relative severity in a recent study conducted by Battelle Columbus Laboratories. Five to ten year projections were made of the ten problems which resulted.

Nine ranking factors were devised to select the ten "most serious" problems from the initial list. The factors included: persistence; mobility/pervasiveness; environmental, technological, social, and political complexity; physiological risk; research needs; and bulk or volume of the pollutant. The ten problems selected by this method were further ranked in order of relative importance. The problems in rank order are as follows:

- Impacts of New Energy Initiatives
- Geophysical Modifications of the Earth
- Trace Element (Metal) Contaminants
- Proliferating Hazardous and Toxic Chemicals
- Emissions from New Automobile Fuels, Additives, and Control Devices
- Disposal of Waste Sludges, Liquids, and Solid Residues
- Critical Radiation Problems
- Fine Particulates
- Expanding Drinking Water Contamination
- Irrigation (Impoundment) Practices

(From "Development of Predictions of Future Pollution Problems". EPA-600/5-74-005, March 1974. EPA, Washington, DC)