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EXPORT SHIPPING DEVELOPMENTS AT NEWPORT, OREGON: AN OVERVIEW

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INTRODUCTION

Newport has always been a single commodity port and will probably remain so. Because of its dependence on timber, Newport shipping activities fluctuate with the foreign demand and domestic supply of lumber, logs, plywood, and paper. Thus, as production of these products falls, exports tend to decline and Newport loses its "trade routes."

Moreover, since Newport has relied over the years on a single export commodity, the possibility of shipping other commodities has decreased. Potential export and import traffic has flowed to and from diversified large ports, like Portland, which are close to large producing and consuming areas. The assurance of continual multi-commodity traffic has prompted these ports to invest in expensive storage and handling equipment (warehouses, cranes, etc.) for their increasing volumes of non-timber commodities. In turn, commodity producers, taking advantage of the efficiencies of capital-intensive port operation, have increasingly shipped by container and thereby induced diversified ports to mechanize.

With no assurance of sizeable, stable commodity flows, small ports cannot afford to invest in the storage and handling equipment necessary for each commodity. Therefore, given the competition with the diversified ports for domestic products and the battle to restructure the "traditional" export and import traffic movement, the rich, diversified ports get richer as the poor, undiversified ports become poorer. Unimpeded, this process will lead to one superport in Oregon and a half-a-dozen superports along the West Coast.

This is a necessary background for understanding the present situation in Newport. Currently, deep water shipping at Newport is a private enterprise operation. Sunset Terminals owns about 100 acres of land and an office building on the northside of Y uina Bay; it presently leases the building to Newport Terminals which is owned by the Brady-Hamilton Stevedore Company of Portland. The terminals maintain two berths with capacity to open two more.

However, only about 3 ships have called at Newport on a monthly basis recently. At best, cargo is shipped on a haphazard basis with an occasional Austrialian or South American ship. No trade routes are developing.

The decline in shipping has also caused a decline in the number of Newport-based longshoremen. Lee Wade, manager of Newport Terminals, is hard pressed to find three gangs to work. Consequently, if more gangs are needed, they must be brought from Coos Bay at the added expense of living costs plus mileage. Unless more ships stop, the longshoreman force will continue to decline.

The decline in Newport shipping and its attendant problems led to the formation of the Yaquina Bay Shipping Council, a group of public-minded Newport citizens, who want to stimulate deep-water shipping at Newport. The group entered into agreement with the Oregon State University Sea Grant College Program and Department of Economics for a study of deep-water shipping. This report is the first phase of that study, and it provides an overview of the issues surrounding export shipping developments at Newport.

NEWPORT SHIPPING IN HISTORICAL PERSPECTIVE

Newport's Dependence on Specific Export Markets

Table 1 shows the gradual decline in export shipments from Newport since 1950. The figures in the table are somewhat deceiving, however, because they do not reveal Newport's dependence on specific export markets.

East Coast Shipments. The largest volumes of lumber out of Newport from 1951 to 1963 went to East Coast markets. During 1951-63 as much as 60% of total Newport exports moved to the East Coast. Simultaneously, however, the Canadian shipping and timber industries began aggressively developing its East Coast markets. Canadian ports could ship lumber more cheaply to the East Coast than American ports because the Jones Act of 1935 requires that American products be shipped to American ports only in American bottoms. This Act helped British Columbia sawmills and penalized Oregon-Washington mills. As Stanford Research Institute indicated in its report, The Benefits and Cost of Alternative Log Export Policies,

> Through the eyes of the coastal British Columbia lumber industry...it would...(be) in their interest to continue concentrating on (the) U.S. Atlantic coast...this reflects the ocean freight advantage enjoyed by coastal British Columbia mills over producers in the Douglas fir region in serving the U.S. Atlantic coast market. The British Columbia mills can ship to that market at considerably lower rates in foreign flag vessels than mills in the Douglas fir region which are put at a competitive disadvantage as compared with Coastal British Columbia mills because of the Jones Act.[1]

Consequently, East Coast shipments rapidly declined until 1970, when no lumber was shipped out of Newport to East Coast markets.

Vietnam Shipments. The second great surge in lumber shipments occurred in the middle and late 1960's, when the majority of Newport lumber was shipped to Vietnam. In 1967 over 50% of the lumber shipped from Newport went to Vietnam. As American activity in the war diminished, Newport shipments declined sharply.

Shipments to Other Markets. There have been consistent but small flows of timber to Japan and Korea, as well as to domestic military markets. In the near future, however, these markets will probably be quite unstable. On the other hand, shipments to California and log shipments by Caffall Brothers should continue.

Decline in Sawmill Production

Over the past 20 years, the number of sawmills in the Pacific Northwest has declined sharply. Table 4 shows this decline in western Oregon. The story is the same in the immediate Newport area. Ten to fifteen years ago there were 30 to 40 mills, currently there are only three: Cascadia, Georgia Pacific, and Guy Roberts. The Stanford Research Institute study helps explain this decline.

> The declining number of sawmills appears to be closely related to various economic forces affecting the structure of the U.S. lumber industry that have been working to a greater or lesser degree in each of the regions

TABLE I

Export Shipments from Yaquina Bay Harbor, by Product, 1950-1973

YEAR	Lumber (mbf)	Logs (mbf)	Plywood (short ton)	Paper (short ton)
1950	76,614	-	-	-
1951	101,391	-	-	-
1952	129,500	-	-	-
1953	117,468	-	-	-
1954	157,783	-	-	-
1955	149,058	-	-	-
1956	135,860	-	-	-
1957	140,437	-	-	-
1958	138,790	-	- 5.34	9,067
1959	153,336	-	-	4,236
1960	151,510	-	-	6,336
1961	96,630	-	-	6,807
1962	115,171	-	-	10,098
1963	126,907	-	-	2,543
1964	99,123	-	-	16,421
1965	90,099	-	39	20,632
1966	69,474	-	-	7,587
1967	99,590	-	-	14,803
1968	91,309	-	-	12,420
1969	56,487	4,928	2,868	19,672
1970	42,385	17,428	3,037	10,830
1971	36,394	10,207	2,334	6,107
1972	44,060	21,980	-	7,026
1973	53,825	27,359	1,422	3,224

1. Coffall Brothers Forest Products Company began log shipments from Yaquina Bay in mid-1969.

Source: Lee Wade, Newport Terminals, Annual Shipping Reports

TABLE 2

Lumber Shipments from Yaquina Bay
to East Coast United States Markets, 1950-73

YEAR	LUMBER (mbf)
1950	51,179,241
1951	49,082,723
1952	45,728,477
1953	33,403,020
1954	86,529,548
1955	81,726,609
1956	66,878,644
1957	80,599,732
1958	75,390,168
1959	85,016,415
1960	80,297,514
1961	52,419,403
1962	59,692,162
1963	54,184,618
1964	56,912,728
1965	51,384,392
1966	Not Available
1967	19,062,103
1968	12,125,837
1969	2,300,851
1970	-
1971	-
1972	-
1973	3,315,262

Source: Lee Wade, Newport Terminals, Annual Shipping Reports

TABLE 3

Export Shipments from Yaquina Bay to Vietnam 1965

Year	Lumber	Plywood	Paper
1965	8,602,840	-	2,778.0
1966	Not Available	-	-
1967	51,368,963	-	-
1968	47,248,167	-	-
1969	30,118,764	2,868.5245	-
1970	12,520,607	2,881.565	-
1971	9,166,178	2,125.6245	-
1972	6,221,588	-	-
1973	104,556	-	-

Source: Lee Wade, Newport Terminals, Annual Shipping Reports

TABLE 4

Number of Active Sawmills in Western Oregon, 1952-72

Year	Number of Mills
1952[a]	761
1957	426
1962	262
1967	228
1972	221

[a] Includes Idle Mills

Source: Western Wood Products Association

> of the United States for many years. Among these, for example, are: (1) the growing inability of sawmills to survive without producing chips from their sawmill waste. (2) the financial weakness of smaller firms that (a) has made them especially vulnerable to the unpredictable and prolonged periods of weak demand and product prices that have characterized U.S. lumber markets and (b) that has made it especially difficult for them to make new investments to upgrade the quality and quantity of lumber output and thus offset rising costs of wood and labor; (3) the heavy dependence of some mills on market supplies of logs or standing timber and lack of low cost captive wood supplies; (4) the historical record of low profitability of the U.S. lumber industry generally; and (5) the development and installation of more efficient processing equipment resulting in a greater volume of production..in existing mills.[2]

Other causal or explanatory factors not mentioned in the previous quotation include log exports, the British Columbia take-over of the East Coast market, and the Federal government's conservative timber management policies.

Of the remaining three mills, Georgia Pacific and Cascadia produce lumber totally for domestic markets and will probably continue to do so in the future.[3] A small part of the Guy Roberts production is exported from Coos Bay. None of this lumber will be diverted to Newport.

Caffall Brothers plan the construction of chippers and a small sawmill that would cut wood of Japanese dimensions.[4] Depending on future log export legislation, this production may be a source of future export shipments.

Timber and Employment Projections

Timber supply and employment studies project a dim future for mill production, expansion, and construction. The Forest Service's 1969 publication The Douglas Fir Supply Study concluded that "continuation of current trends of private log production in Western Oregon and Southwest Washington would lead to a 65% reduction in annual private harvests within 30 years."[5] The Outlook for Timber in the United States, a 1973 Forest Service publication projects "a nearly 50% decrease on forest industry lands" because of the "reduction of old growth forests."[6] Brian R. Wall in his 1973 Forest Service study..... used Outlook figures to estimate that (assuming a constant trend in labor productivity) "employment in the timber based industries in the Douglas fir region is projected to drop 45% between 1970 and 2000."[7]

Increased Forest Service timber production will not affect the predicted decline in private timber production. For example, the Siuslaw National Forest's current timber management plan has an allowable cut of 382 million board feet, and this cut limitation will not increase in the near future. In fact, the allowable cut may decrease when forest land use planning is completed.

All in all, timber production in the immediate Newport area will not expand and will more likely decline during the next quarter century.

WHY THE VOID HASN'T BEEN FILLED

The decline of Newport shipping can be causally related to many interdependent problems. One of the biggest problems is simply getting cargo in sufficient quantity for a ship to stop. As Lee Wade said, "Shipping companies want a million board feet of lumber before a ship will stop or 1000 tons of grass seed. Both are difficult to accumulate." [8]

The flip side of this problem is that the shipping companies want domestic markets for the goods they carry. Much as truckers desire backhaul, ships want to unload goods at ports where they pick up export cargo. This has been a major problem for Newport.

Newport is neither a major producing nor consuming area, and thus it is dependent on the Willamette Valley, specifically five (5) counties: Benton, Lane, Linn, Marion and Polk. Without adequate transportation from the Valley to Newport, without specialized storage and handling facilities for grains, seeds, fruits, vegetables, and manufactured products, without sufficient quantities of these commodities to ship, and without aggressive export promotion by the Port, the state and the producing companies together, the Port did not develop.

The Transportation Problem

Railroad. Currently there is Southern Pacific rail service from the Willamette Valley to Toledo. Some years ago there was an extension to Newport but because of insufficient traffic the line was closed. Thus, shipments destined for Newport have to unload at Toledo and be barged or trucked to Newport, thereby requiring extra handling. The cost of extending the line, according to Bert Kleinhaus, office engineer in the Southern Pacific's Portland office, would be in the range of 1.5 to 3 million dollars.[9] It is highly unlikely that an extension will be built in the forseeable future.

Highway 20. In 1948, the Highway 20 Association was organized "to work... for the straightening, widening and improvement of U.S. Highway 20 from Newport to Boise."[10] Due in large part to the Association's efforts, there has been over 30 million dollars in improvements made on the highway. However, since the construction dollar goes 4.5 times further east of the Cascades then west, there have only been relatively small highway improvements from Corvallis to Newport."[11]

In fact, despite improvements made in 20 of the last 25 years, Highway 20 is still as one Newport citizen said a "bitch". It still takes over an hour to make the Corvallis-Newport trip by truck; the highway still has numerous winding sections. Partly as a consequence, except for truck runs during the Vietnam war, there has been no consistent carrier service between Corvallis and Newport.

Transportation cost comparisons made by Lee Wade for Professor Robert Shirley's 1966 study, An Economic Study of the Seaport at Newport Oregon and its Relation to Use of Highway 20, showed that most commodities could be trucked cheaper to Newport than Portland from southern locations in the Willamette Valley.[12] On the surface, this still holds true today. However, as Shirley noted, "Many commodities are moved by exempt, contract, and private motor carriers. Rates tend to be negotiated and are a function of the volume of traffic moving."[13] Moreover, as Shirley remarked, "of crucial importance is the possibility of truckers securing a two-way haul. Favorable rates from truckers largely depend on loads being available at origin and destination. Portland has substantial back-haul available and thus obtains favorable rates from motor carriers."[14]

This has created a natural flow of export and import to and from the Willamette Valley through Portland.[15] Considerable barge traffic moves to Portland via the Willamette and Columbia Rivers. The competitive barge rates have influenced rail and truck rates to and from Portland, resulting in a favorable rate structure for Willamette Valley-Portland trade.[16] This trade movement is traditional. Consequently, realistic analysis suggests that little if any cargo now moving through Portland is likely to be diverted to Newport.

Lack of Commodities, Storage and Handling Facilities

For a variety of reasons, some which have already been mentioned, no non-timber commodity has been shipped from Newport. This is partly because of the special characteristics of each commodity, the quantity of each commodity produced and the lack of promotion by market specialists.

Each Willamette Valley-produced commodity requires special handling and storage equipment. Currently, Newport has covered storage cpapcity of 16,000 square feet available for manufacture goods, bulk products and containers. Newport does not, however, have warehouse facilities for grains, crane services for containerized products, or refrigerated storage for fish, vegetables or fruit. Investment in these capital items would require millions of dollars including at least $2 million for a suitable crane alone.[17] In addition, use of the crane for containers would require at least 50 acres of space for cargo moving through the Port. Without substantial investments in equipment and additional land, Newport cannot handle grains, fruits, vegetables, or fish, seeds and manufactured goods, which are moved today by containers.

Moreover, Willamette Valley products have not been agressively promoted. In a series of articles written by the Corvallis Gazette-Times writer,[18] Mike Bradley, officials talked again and again of potential but none offered any specific proposals to increase exports. As Robert Dodge, executive director of the Oregon Legislature's Committee on Trade and Development, remarked, "there is plenty of room in Oregon to expand production. The state is not doing as good a job as it could, for instance, in the manufacture of wood products."[19] But another Dodge quote in the Bradley article possible shows his misunderstanding of the problems, "The Willamette Valley could grow strawberries and find an overseas demand for them. I am told they could sell at $5 a berry in Russia and $1 a berry in Japan. There are plenty of acres in the valley that could grow strawberries."[20]

Tables 5 through 8 give the total production of grains, seeds, mint oil and and the total sales of fruits and vegetables raised in the Willamette Valley five-county area. To get an additional 20 to 50 ship stops per year, it would require not only additional investment in handling and storage equipment, but also sufficient cargo to justify the ship to stop. According to Lee Wade, the average ship docking in Yaquina Bay is 500 feet long, has a capacity of 10,000 tons, and requires a minimum 1000 ton load. According to estimates by Dr. Shirley in 1964, the total fruit, nut, and vegetable crop in the 5 county area could be shipped in just 20 fully-loaded ships.[21] Moreover, the total mint oil seed crops in 1970 could be shipped in 24 ships. Thus, the Port would need a mix of these commodities to develop any trade routes or to induce any large number of ships to stop.

Of course, it is important to remember that Portland already exports 10% of Oregon seed production, although its dominant cargo is grain. These exports are unlikely to be diverted to Newport.

TABLE 5

Seed Production: Benton, Lane, Linn, Marion, Polk and Lincoln Counties, 1970-73 (1,000's pounds)

Seed Type	1970	1971	1972	1973
Hairy Vetch Seed[1]	780	925	730	775
Rye Grass Seed	215,342	259,100	205,820	203,623
Tall Fescue Seed	8,853	12,896	9,580	12,313
Red Fescue Seed	3,589	4,576	3,540	4,059
Bent Grass Seed	6,532	8,701	8,191	7,847
Red Clover Seed[2]	1,435	1,276	1,678	766
Crimson Clover Seed	1,510	645	580	556
Totals	238,041	287,519	230,119	229,939
Tons	119,000.5	143,759.5	115,059.5	114,969.5

1. Includes Production in Clachamas County
2. Does not include production in Lane County

Source: Oregon Commodity Data Sheet, OSU Cooperative Extension Service.

TABLE 6

Grain Production: Benton, Lane, Linn, Marion, Polk and Lincoln Counties, 1971-73 (1000's Bushels)

Grain Type	1971	1972	1973
Wheat	2,811	3,435	6,341
Barley[1]	37,524	29,652	33,948
Oats	1,543	1,151	1,291

1. Barley production is in tons and not bushels.

Source: Oregon Commodity Data Sheet, OSU Cooperative Extension Service.

TABLE 7

Mint Production in Benton, Lincoln, Lane, Linn, Marion and Polk Counties, 1969-71

Year	Production (000's lbs.)
1969	1,079
1970	1,296
1971	990

Source: Oregon Commodity Data Sheet, OSU Cooperative Extension Service.

TABLE 8

Value of Sales: Tree Fruit and Nut Crop and Vegetables for Benton, Lincoln, Lane, Linn, Marion and Polk Counties, 1970 (000's dollar)

Year	Tree fruit and Nut Crop[1]	Vegetables[2]
1970	8,369	21,202

1. Includes Apples, Sweet Cherries, Sour Cherries, Peaches, Bartlett Pears, Winter Pears, Prunes and Plums, Apricots, Grapes, Filberts, Walnuts, and all other Berries.

2. Includes Snap Beans, Beets, Sweet Corn, Green Peas, Onions and other Vegetables.

Source: Oregon Commodity Data Sheet, OSU Cooperative Extension Service.

Fish Industry

One natural commodity potentially shipped from Newport could be fish products. According to Dr. Fred Smith, currently 5% of the total Newport area production is shipped from Portland.[22] Dr. Smith remarked it is unlikely that any fish products would ever be exported from Newport for two reasons. First, the fishing industry is highly institutionalized and very slow to adopt to new technologies. Second, the fish products industry is dominated by Seattle and San Francisco conglomerates that truck their product to their home plant before it is shipped.

Other Ancillary Services

Unlike the Port of Portland, the Port of Newport has no major marketing division, research department, service of freight forwarders, bonding agents, or international financial institutions necessary to develop substantial amounts of extra traffic. All of this work is left to one man, Lee Wade.

With a weak financial base the Port not only cannot affort the qualified staff necessary for these operations but finds it extremely difficult to get development bonds. The total personnel budget of Port of Newport would not pay the salary of a middle-level executive at the Port of Portland. Understandably, then, there is a lack of unity and direction among the commissioners and interested citizens. This report is evidence of this lack of direction.

Lack of Unified State Effort

State export promotion is similarly marked by a lack of coordination and direction. Evidence of this is the 1973 Oregon Legislature's resolution to establish a legislative committee on trade and development whose purpose is to coordinate trade development activities. The committee has been in existence for two years, under the direction of Dr. Dodge. In 1974, Dodge noted, "so far the committee has found more than 20 agencies concerned with trade development."[23] This obvious lack of coordination translates into underdeveloped export markets. As Howard Traver, international manager for the Oregon Department for Economic Development, has observed, "Oregon is not selling it products abroad to the extent it could. It should get out and scour."[24]

The scarcity of state offices in key foreign countries leaves individual firms on their own to find export markets. Dick Baertlein, plant manager, for Foamat Foods Corporation, Corvallis, outlined the difficulties this presents: import restriction, duties and regulation requirements, problems of currency, and the difficulty of doing business from afar.[25] As Gene Graf, former employee of Foamat, remarked, "overseas shipping is the most complicated thing you ever saw."[26]

The lack of state effort can be seen in comparison with the Puget Sound development that is threatening further development of all Oregon's Ports. As Mike Bradley wrote in his article, "Puget Sound Ports Threaten Portland."

> Robert Dodge, executive secretary for the Oregon Legislative Committee on Trade and Development, agreed there was reason for Oregon to be concerned over the Puget Sound Activity. George Grove, Port of Astoria manager, sees Puget Sound as a serious threat. Other state and port officials expressed concern.

Dodge pointed to what apparently is complete cooperation between all Washington agencies--state, county, city, and port,-working for port developments.

Dodge said he attended a meeting in Seattle that was aimed at long range overseas market development. The Washington governor, Seattle Mayor, county and port officials were working together on the program, Dodge said.

In the background, smiling, were Washington's U.S. senators, Warren Magnuson and Henry Jackson, he said. [27]

The uncoordination of export activities in Oregon, moreover, is understated by the 1973 legislatures refusal to appropriate money for the Ports division of the state Department of Transportation. Withdrawal of the state from port activities leaves development of the ports to local port commissioners and their regional organizations. But, as Fred Weakly notes, most of these commissions are concerned with the mere survival of the coastal ports and not exports, per se.

PROSPECTS AND RESEARCH SUGGESTIONS

The advantages of Yaquina Bay shipping are well known. There is ready access to the ocean, enabling vessels to enter the harbor in about 30 minutes. This may be compared to Portland where it takes ships 8 hours up the Columbia River to reach the Portland docks. Using the Newport docks instead of Portland would save ships thousands of dollars in operating costs. Despite this advantage, Newport shipping has not grown for the reasons indicated in the previous section of this report.

Currently, the major hope for Newport shipping lies with Northwest Natural Gas Company shipping. The company will haul liquified natural gas from southern Alaska to Newport to be fed into Oregon pipelines. The company plans to construct a wharf and other facilities adjacent to Newport terminals.

The delivered gas will be intensely cold and when unloaded dissipate considerable amounts of heat. The Port, as of now, plans to build a cold storage plant in conjunction with this natural gas operation. Possible offspring of this project could include fish processing and storage facilities, refrigerated storage, and fertilizer development.

These opportunities provide a reasonable point for further studies of deep-water shipping possibilities at Newport. Additional research is necessary in two areas. First, the Port of Newport could begin now to develop the export of seed crops. An in-depth study of seed transportation costs, handling and storage problems, and the development of export markets could assist the Port to reduce timber's dominant role. Secondly, research could be done on the regional economic and social effects of maintaining Newport's navigation channels. The U.S. Army Corps of Engineer's recently estimated that the costs of maintaining Yaquina Bay's deep channel to the Pacific Ocean are about 4 times greater than its benefits to shipping. [28] Although this estimate may be incorrect, a benefit-cost ratio of only 0.25 suggests rather grim implications for Newport. Therefore, a

detailed analysis of the total benefits and costs of maintaining the Newport channel is needed. The study would investigate, among other things, (1) the magnitude of transportation cost savings potentially attainable at Newport and (2) the impact of shipping activities on employment and income in the Newport area.

Both of these studies are likely to be undertaken during the fall term 1975 by students in two courses, Public Expenditure and Regional Economics, at Oregon State University under the direction of Drs. Donald Farness and R. Charles Vars.

FOOTNOTES AND REFERENCES

1. Stanford Research Institute, Benefits and Costs of Alternative Log Export Policies, Phase I report, draft prepared for: Pacific Northwest Regional Commission, Vancouver, Washington, Feb. 1974, p. 38.

2. Ibid., pp. 66 & 67.

3. L.R. Chabot, Division Controller, Georgia Pacific Mill at Toledo, May 2, 1975 Interview.

4. Fred Weekly, Executive Secretary Port of Newport May 22, 1975 Interview.

5. Regions 5 and 6, Pacific Northwest and Range Experiment Station, Forest Service, U.S. Department of Agriculture, Douglas-Fir Supply Study, (1969), p. vii.

6. Forest Service, U.S. Department of Agriculture, The Outlook For Timber in the United States, October 1973, p. 81.

7. Brian R. Wall, Employment Implications of Projected Timber Output in the Douglas-Fir Region, 1970-2000, Abstract, Pacific Northwest Forest and Range Experiment Station, Research Note PNW 211, Portland, Oregon.

8. Mike Bradley, "Without Action, Oregon will lose out," March 30, 1974, Corvallis Gazette Times, Corvallis, Oregon, p. 13.

9. Telephone Communication, June 19, 1975.

10. Robert E. Shirley, An Economic Study of the Seaport at Newport, Oregon and Its Relation to Use of Highway 20. A report prepared for the Highway 20 Association, Oregon State University, Corvallis, Oregon, May 1966, p. i.

11. Ibid., p. ii.

12. Ibid., p. 33.

13. Ibid., pp. 33,34.

14. Ibid., p. 34.

15. Ibid., p. 5.

16. Ibid., p. 5.

17. Mary Brugo, Research Department, Port of Portland, May 22, 1975 Interview.

18. The 6 part series entitled "The Meaning of Overseas Trade", the Corvallis Gazette Times, March 25, 1974 to March 30, 1974.

19. Mike Bradley, "Aggressiveness is Key to Oregon's World Market", Corvallis Gazette Times, March 25, 1974, p. 1.

20. Ibid., p. 1.

21. Robert E. Shipley, op. cit., p. 26.

22. Dr. Fred Smith, Marine Economist, O.S.U. Sea Grant extension agent, June 17, 1975 Interview.

23. Mike Bradley, op. cit., p. 1.

24. Ibid., p. 1.

25. Interview, May 30, 1975.

26. Mike Bradley, "Foreign Money has Big Impact in Valley" Corvallis Gazette Times, March 27, 1974, p. 2.

27. Mike Bradley, "Puget Sound Threatens Portland" Corvallis Gazette Times, March 26, 1974, p. 2.

28. Fred Weakly, May 22, 1975, Interview.