

Background and References

1. **44. UO's application for a Conditional Use Permit**— Submitted Feb. 26, 2018:
<http://pdd.eugene-or.gov/LandUse/ApplicationDetails?file=CU-18-0001>
2. **Previous UO Senate resolutions**
 - a. **(US98/99-4, Jan. 13, 1999) RESOLVED** that the University Senate hereby urges President Frohnmayer to exclude the University-owned lands in the RiverView and Gateway Sectors from any future commercial development and to designate these lands for open space, recreational fields and natural areas. Passed: 20 in favor, 10 opposed
 - b. **(US09/10-11, Jan 13, 2010) RESOLVED:**
 - i. the University Senate declares opposition to the planned development of the first 4.3-acre increment of the Riverfront Research Park North of the railroad tracks on the South bank of the Willamette River until the University undergoes a student and faculty inclusive, open process for revising the RRP Master Plan; and
 - ii. that the Senate President be directed to write and send a letter to the University President and the City of Eugene expressing the Senate's opposition to the planned development North of the railroad tracks along the South bank of the Willamette River.
 - c. **(US10/11-04, Oct. 18, 2010) RESOLVED:** That the UO Senate requests that President Lariviere comply with the terms set forth in the Intergovernmental Agreement for the Riverfront Research Park prior to initiating groundbreaking or construction activities in the Riverfront Research Park north of the railroad tracks, and to report to the Senate without delay how the University has maintained and will remain in compliance with the agreement.

3. UO academic courses that currently use the UO Riverfront in their curriculum. This is an incomplete list that includes courses that utilize the riparian zone and/or the adjacent "upland" (including areas proposed for playing fields and buildings*) in their academic curriculum.

Department	Course Number	Course Name	Max. enrollment per year
Anthropology	Anth145	Principles of Archaeology*	200
Art	Art233	Drawing 1*	54
Biology	Bi130	Introduction to Ecology*	200
Biology	Bi131	Intro to Evolution	200
Biology	Bi132	Intro to Animal Behavior*	200
Biology	Bi370	Ecology*	100
Biology	Bi4/572	Systematic Botany*	25
Biology	Bi372	Field Biology*	25
Biology	Bi306	Pollination Ecology*	25
Biology	Bi4/559	Ornithology*	25
Biology	Bi452	Insect Biology*	25
Biology	B4/548	Field Botany*	25
Biology	Bi4/532	Mycology*	25
Biology	Bi307	Forest Biology	25

Biology	Bi374	Conservation Biology*	50
Biology	Bi390	Animal Behavior*	75
Biology	Bi283H	Honors Biology III*	40
Environmental Studies	Env4/577	Natural and Cultural History*	25
Environmental Studies	Env4/577	Soil Science*	25
Environmental Studies	Env4/527	Env. and Ecol. Monitoring*	30
Geography	Geog323	Biogeography*	100
Earth Sciences	Geol101	Earth's Dynamic Interior	400
Earth Sciences	Geol201	Earth's Interior Heat & Dynamics	68
Earth Sciences	Geol102	Earth's Surface Environment	400
Earth Sciences	Geol202	Earth Surface & Environ. Geology	44
Earth Sciences	Geol103	Evolving Earth	400
Earth Sciences	Geol203	Evolution of the Earth	80
Earth Sciences	Geol199(FIG)	Fire & Ice: PNW Geology)	20
Earth Sciences	Geol318	Introduction to Field Methods	20
History	Hist4/573	Environmental History*	25
Landscape Architecture	LA326	Plants, Fall*	50
Landscape Architecture	LA328	Plants, Spring*	25
Landscape Architecture	LA337	The Nature of Eugene*	40
Landscape Architecture	LA337	Trees across Oregon	60
Landscape Architecture	LA 390	Urban Farm*	343
Landscape Architecture	LA4/540	Intro to Land Planning*	35
Landscape Architecture	LA4/541	Principles of Applied Ecology*	35
Landscape Architecture	LA Design Studios	1-2 Studios/year*	20
Library	Lib199(FIG)	The PNW: Present and Primeval*	20
Museum of Natural & Cultural History	Ed Davis/Museum	Various primary school classes	40
Sum of affected students, per year:			3624

*Some or all course activities take place in the uplands, including areas of potential playing fields.

4. Related to the special nature of the Willamette River

- d. River ranking by discharge.** The Willamette is the third largest river in the western US as measured by average discharge, and 19th in the U.S. overall, including Alaska.
- i. Kammerer, J.C., 1990. Largest Rivers in the United States. US Geological Survey Open File Report 87-242
 - ii. <https://pubs.usgs.gov/of/1987/ofr87-242/pdf/ofr87242.pdf>
- e. National Water Trail.** The easily navigable parts of the Willamette river, including all of which flows through Eugene, have been designated a National Water Trail, part of the National Trail System.
- i. "The National Water Trails System has been established to:
 1. Protect and restore America's rivers, shorelines, and waterways and conserve natural areas along waterways.
 2. Increase access to outdoor recreation on shorelines and waterways."
 - a. <https://www.nps.gov/WaterTrails/Trail/Info/36>
 - b. <https://www.nps.gov/WaterTrails/Home/About>

- f. **American Heritage River.** In 1998, the Willamette River was designated by President Bill Clinton as one of 14 American Heritage Rivers.
 - i. Priorities for the Willamette under this designation include “protection and restoration of wetlands and floodplains, cost-effective solutions to flooding and sewage problems, improving the health of aquatic species and habitat, and minimizing the impacts of population growth and changing land use.”
 - ii. <https://clintonwhitehouse2.archives.gov/CEQ/Rivers/willamette.html>
- g. **National Natural Landmark.** Part of the Willamette Floodplain north of Eugene was established as a National Natural Landmark in 1987. It was designated as such since Willamette River-associated grassland and shrubland habitat is now exceedingly rare, with most having been cultivated, turned into pastureland, and developed.
 - i. <https://www.nps.gov/subjects/nlandmarks/site.htm?Site=WIFL-OR>

5. Related to habitat for sensitive, threatened and/or endangered species:

- h. **Species federally listed as threatened or endangered and in the river along UO’s property.**
http://www.dfw.state.or.us/wildlife/diversity/species/threatened_endangered_species.asp
 - i. Upper Willamette River Chinook Salmon (*Oncorhynchus tshawytscha*)
 - ii. Upper Willamette River Steelhead (*Oncorhynchus mykiss*)
- i. **Species listed by Oregon as sensitive, representatives of which have been identified along UO’s riverfront.** The OR Sensitive Species List serves as an early warning system for biologists, land managers, policy makers, and the public.
http://www.dfw.state.or.us/wildlife/diversity/species/docs/2017_Sensitive_Species_List.pdf
 - i. Lamprey species (an aquatic, fish-like group of animals)
 (*Entosphenus tridentata*, *Lampetra ayresii*, *Lampetra richardsonii*)
 - ii. Western Gray Squirrel (*Sciurus griseus*).
- j. **Recently delisted from federal endangered species act list, known from UO’s riverfront**
 - i. Bald Eagle
 - ii. Peregrine Falcon
- k. **Additional sensitive, threatened, or endangered species that would be favored by appropriate restoration of the UO Riverfront.**
 - i. Birds
 1. Acorn woodpecker
 2. Western bluebird
 3. Olive-sided flycatcher
 4. Grasshopper sparrow
 5. Western meadowlark
 6. Streaked horned lark
 7. Purple martin (occurs in the vicinity of UO riverfront).
 8. Willow flycatcher
 9. White-breasted nuthatch
 - ii. Reptiles and Amphibians
 1. Western Pond turtle
 2. Northern red-legged frog
 - iii. Bats, several species
 - iv. Plants, several species

3. **Examples of Universities that are promoting their brand through forward-thinking stewardship of natural resources and reaping great benefits in terms of recruiting and retention.** *This list is not comprehensive.* Our UO riverfront is more modest in size than most of these, but is a unique resource for its riparian area and proximity to campus (walk out the door with your class and you're almost there):
- a. **Arboretums** – Near campus, used extensively for restoration and education
 - i. **University of Michigan** – Nichols Arboretum <https://mbgna.umich.edu/>
 - ii. **University of Georgia** – Georgia State Botanical Garden <http://botgarden.uga.edu/>
 - b. **Educational Forest Management Reserves** – Albeit, these are land-grant institutions with substantial acreages and reserves are distant from campus. Their educational and recruiting value, however, is extraordinary.
 - i. **North Carolina State University** – Forest Reserves, <https://cnr.ncsu.edu/fer/about/forests-and-facilities/>
 - ii. **Michigan State University** – Kellogg Biological Reserve <http://www.kbs.msu.edu/>
 - iii. **Oregon State University** – MacDonald Forest <http://cf.forestry.oregonstate.edu/mcdonald-forest-trails>
 - c. **Organic Farm** – For research, student field learning, and community education.
 - i. **University of San Francisco** – Star Route Farm, 100-acre organic farm <https://www.usfca.edu/newsroom/media-relations/news-releases/star-route-farms>
 - d. **Wetland and Public Space**, on campus
 - i. **Wellesley College** – Converted a parking lot covering a toxic brown-field into an award-winning wetland <https://www.asla.org/sustainablelandscapes/brownfield.html>;
 - e. **Natural Areas for Academic Programming** – emphasizing environmental restoration, habitat conservation, and also low-impact public recreation.
 - i. **Stanford University** – Dish area (<https://dish.stanford.edu/>),
 - ii. **Harvard University** – Harvard Forest, remote from Boston, <http://harvardforest.fas.harvard.edu/>
 - iii. **Duke University** — Duke Forest, 1-mile from campus, <http://dukeforest.duke.edu/>
4. **Background related to importance of riparian areas, best practice, and current uses for academic education.**
- a. As simple as it may sound, the Riverfront is a unique and exceptional piece of property because it is along a river. Riparian zones provide a plethora of critical ecological services, including clean water, flood control, and habitat that can be achieved nowhere else. While the UO Riverfront is not “pristine” it is considerably less damaged than, for example, the (now remarkable) Eugene Delta Ponds were prior to restoration.

- b.** Putting artificial turf (typically petroleum based) playing fields and bright lights on the riverfront will expose organisms along the river to potential leachates from the fields, ingestion of man-made particulate turf infill materials, and disruption of circadian rhythms and flight paths from the lights.
- c.** Many ecological functions require large riparian buffer widths. While urban areas may not be able to provide full riparian functionality, available scientific data (as summarized in the document linked below) would favor much larger buffer widths than the 100'-200' proposed in the CUP. The proposed narrow riparian buffer would substantially limit what the university could achieve in its stewardship of the Riverfront – both ecologically and educationally. <https://tinyurl.com/y6utnp24>
- d.** The broadly accepted Precautionary Principle posits that when there is plausible risk to people or the environment, the weight of evidence should be placed on those proposing an action to demonstrate conclusively that it will NOT harm said people or the environment, and, in the case of the UO Riverfront, this has not been done.
- e.** Furthermore, the Riverfront is used now by thousands of students in academic classes (including Ecology, Field Biology, Pollination Ecology, and several classes in Earth Sciences, History, Anthropology,, Geography and AAA).
- f.** We are now have a "once-in-a-landscape" opportunity to create a vision for the Riverfront that would make it a centerpiece for sustainability and restoration practices and teaching at the University of Oregon.

APPENDIX 1 - PRELIMINARY

3/10/18

TO: U of Oregon Faculty Senate

FRO: Ed Whitelaw, U of Oregon, Economics and FION with Samier Waqar, FION

RE: U of Oregon's Proposal for North Campus Conditional Use Permit

NB: On 2/14/18, I submitted to the UO Faculty Senate an earlier, succinct and perhaps cryptic edition of my comments on the UO Proposal. In this 3/10/18 edition, I've reversed none of my initial opinions, and I've added clarification, more foundation, and some new opinions, including much stronger condemnation of the UO Proposal.

I. Origin, Purposes, and Conclusions of This Memo

A. Origin: In a 1/22/18 email to me regarding the UO's "proposed developments north of the railroad tracks and near the river," George Evans stated that he and other UO faculty believe "the university [has not] adequately [taken] into account the loss of habitat, effects of light pollution, and the amenity values to those who walk, run or bike on the paths that are near these proposed developments." He doubted the UO had tried "to quantify the lost benefits for current users and future users." He and I agreed I would: 1) describe how best to quantify comparing the alternatives for handling the area between the tracks and into the river; and 2) evaluate how well the UO Proposal serves the objective of a quantitative comparison of the alternatives. Since George Evans' email and his and my subsequent exchanges, I added 3), namely, scrutinize the 34,000-student footprint. George is innocent of this #3 addition.

B. Purposes:

1. In Part II of this memo, I heed the UO Proposal's implicit request to pay no attention to what's behind the curtain labeled "34,000-STUDENT FOOTPRINT!" My purpose in Part II then is to evaluate the UO's alternative-free proposal, taking the 34,000-student footprint as given. But then, borrowing from cost-benefit analysis (CBA),¹ I enrich the UO Proposal with what I see as some of the salient, relevant alternatives. I characterize Part II as "Standing Very Close and Squinting."
2. In Part III, I look behind the curtain (aka I question the 34,000-student footprint) by comparing what the UO *appears to have done* and what it should have done. I characterize Part III as "Stepping Way Back with Eyes Wide Open."
3. In Part IV, I examine how well the UO and Eugene are handling their social capital², especially their institutions, in the matter at hand.
4. In Part V, I list the main sources on which I've relied. In Part VI I list my affiliations and qualifications.

C. Conclusions: The UO Proposal in general is irrelevant to the purpose of optimizing the use of what I call the "relevant area," namely, the area between the tracks and into the river. Below, I identify a number of specific fatal errors. By "fatal error," I mean an error sufficient, on its own, to render the UO Proposal irrelevant.

¹ Cost-benefit analysis (CBA) "is a systematic approach to estimate the strengths and weaknesses of alternatives." <<https://en.wikipedia.org/wiki/Cost%E2%80%93benefit_analysis>>

² Social capital is "the institutions, relationships, and norms that shape the quality and quantity of a society's social interactions" World Bank. 1999. <<http://www.worldbank.org/en/webarchives/archive?url=httpzzxxweb.worldbank.org/archive/website00996A/WEB/OTHER/COMMUNIT.HTM&mdk=21600690>>

D. Various: I proffer this memo as work in progress. It's neither definitive nor subjunctive and, of course, not exhaustive. But it's certainly indicative.³ Without my colleague Samier Waqar's collaboration, I wouldn't have come close to pulling this together. I alone am responsible for any errors of omission or commission.

II. Take the 34,000-Student Footprint⁴ as Given: Standing Very Close and Squinting

A. Concept, Method, and Summary of Conclusions

1. Concept: At the conceptual level, the seemingly narrow matter at hand—what to do with the relevant area—involves the Venn Diagram intersection⁵ of at least three dynamic systems: an urban system, an ecological system composed of adjoining riverine, riparian, and land subsystems, and climate change.
2. Method: Assuming the UO Proposal contained alternatives to the physical capital⁶ and natural capital⁷ it proposes, the UO should have adopted a credible method for comparing alternative sets of uses for the relevant. It didn't. The most widely respected and applied method for comparing such alternatives is cost-benefit analysis (CBA). In choosing a method, the UO should explain its choice by contrasting it with the alternatives it could have chosen, e.g., CBA. It didn't do this either.
3. Summary of Conclusions
 - a. Among the UO Proposal-related documents I've reviewed, I've not found a specific method by which the UO has developed its proposal. Instead I've found a collection of partial analyses⁸. To conduct a partial analysis, one must hold other conditions constant. But when examining complex, dynamic systems, e.g., urban and ecological systems in the context of climate change, failing to include variables and units of measurement in common dooms trying to rank alternatives rigorously. The UO Proposal omits such variables and units of measurement, a fatal error of omission.
 - b. Not incidental, in his 1/22/18 email to me regarding the UO Proposal, George Evans reported that he and other UO faculty believe "the university [has not]

³ For your convenience and my control, I've grabbed these definitions from <<http://www.dictionary.com>>: *definitive*, (of a conclusion or agreement) done or reached decisively and with authority; *subjunctive*, noting or pertaining to a mood or mode of the verb that may be used for subjective, doubtful, hypothetical, or grammatically subordinate statements or questions; *exhaustive*, a subject, topic, etc., comprehensive, thorough; and *indicative*, showing, signifying, or pointing out.

⁴ For the 34,000-Student Footprint see: https://cpfm.uoregon.edu/sites/cpfm2.uoregon.edu/files/north_campus_community_stakeholder_questions_updated.pdf.

⁵ For Venn diagram, see <https://en.wikipedia.org/wiki/Venn_diagram>.

⁶ Physical capital is "those durable produced items that are in turn used as productive inputs for further production," e.g., buildings, soccer fields, and utilities. Samuelson, P.A. and W.D. Nordhaus. 2005. Economics, 18th ed. New York: McGraw-Hill Irwin. p 267.

⁷ Natural capital is the "endowment of environmental and natural resources," e.g., the ecological system I describe above in IIA(1) above. Teitenberg, T. and Lewis, L. 2015. Environmental & Natural Resource Economics. 10th ed. New Jersey: Pearson. p. 570.

⁸ Partial Analysis: https://en.wikipedia.org/wiki/Partial_equilibrium

PRELIMINARY

adequately [taken] into account the loss of habitat, effects of light pollution, and the amenity values to those who walk, run or bike on the paths that are near these proposed developments” and doubted the UO had tried “to quantify the lost benefits for current users and future users.” Their judgments are spot on. This error is egregious and unequivocally fatal to the UO Proposal. Furthermore, the methods for such valuations are readily available, e.g., contingent valuation, benefit transfer, and, if it comes to it, habitat equivalency analysis.⁹ I’ve testified successfully using these methods, e.g., benefit transfer in the State of Oregon’s trespass case over the 1999 grounding of the *New Carissa* on the Oregon Coast.

- c. In its proposal, the UO commits other fatal errors. I list only three of them in Part II(B).
- B. Judging Three of the UO’s Errors by Cost-Benefit-Analysis (CBA) Standards¹⁰
1. Identify the Relevant Scope¹¹: In this matter, the relevant scope has three dimensions: services, geography, and time. Addressing each of the three dimensions of the relevant scope with rigor and clarity is a necessary condition for meeting the professional standards of CBA. The UO Proposal fails to meet this condition for any of the three dimensions, and thereby makes fatal errors of both omission and commission.
 - a. In the UO Proposal, the relevant services, through this economist’s eyes, are the services demanded from the physical capital proposed and the services demanded from the natural capital, both as the natural capital is and how the community of UO faculty, students and staff as well as of other residents of Eugene all would like it to be. Throughout the UO Proposal I’ve found no evidence any of the authors shared my view of these respective roles of physical and natural capital. More’s the pity.
 - b. Above in this memo, I used the term, “relevant area,” which is not a term of art in economics. The term, “relevant geography,” is a term of art in economics when addressing markets or, e.g., the Venn Diagram intersection of an economic system and an ecological system, e.g., San Francisco metropolitan area, San Francisco Bay and Bay Delta, and the Sacramento and San Joaquin Rivers. In the context of the UO Proposal, the relevant geography, arguably, is the entire Willamette River and Valley. At the least, the UO Proposal should regard the relevant geography as no less than a mini-Venn Diagram intersection of the urban economic system, the UO economic system, and the riverine-riparian-

⁹ For contingent valuation, see <https://en.wikipedia.org/wiki/Contingent_valuation>. For benefit transfer, see <https://www.ecosystemvaluation.org/benefit_transfer.htm>. And for habitat equivalency analysis, see <<https://darrp.noaa.gov/economics/habitat-equivalency-analysis>>.

¹⁰ My written and oral testimony in 2003-04 before and on behalf of the NAFTA Tribunal in a dispute between Canadian corporation, Methanex, and the U.S. I’d been retained by the U.S. State Department. My testimony focused primarily on the application of cost-benefit analysis. It prevailed over that of Gordon Rauser, then Dean of the College of Natural Resources, UC Berkeley.

¹¹ Rossi, P. and H. Freeman. 1982, *Evaluation: A Systematic Approach*, Second Edition. Sage publications. pages 275-276; Office of Management and Budget. 2003. *Informing Regulatory Decisions: 2003 Report to Congress on the Costs and Benefits of Federal Regulations and Unfunded Mandates on State, Local, and Tribal Entities*. Office of Information and Regulatory Affairs. February. page 132

PRELIMINARY

terrestrial ecological subsystems. My reasoning for this derives directly from the reasoning underlying the sources of demand for the services in II.B(1).

- c. Mentioning the term and topic, time, in this matter cracks open a door to a large room the authors of the UO Proposal appear never to have entered. As to my time, I've run out of it. For expedience, then, I punt "time" to II.B(3), Risk and Uncertainty, to describe the relevant time and some of the other occupants of the large room.
2. Identify the Alternatives¹²: The UO Proposal fails to identify all—perhaps any—of the alternatives i) to the physical capital (buildings, soccer fields, and utilities) it proposes or ii) to the natural capital it proposes. Again, these are fatal errors of omission. More important, the cause of death is telling. Without alternatives, as George Evans nailed it in his 1/22/18 email to me, one can't know what we're missing, i.e., one can't know the value of the options forgone. That is, the UO Proposal has no clothes. It's reduced to naked assertion.
3. Risk and Uncertainty¹³: Distinguish between, and account explicitly for each of risk and uncertainty.¹⁴ The UO omits this step. Omitting uncertainty within the context of climate change in a project that has implications for generations¹⁵ is a fatal error.¹⁶ From II.B(1c), I punted relevant time here, II.B(3). Simply to point out some of the other occupants of the large room I mention in II.B(1c), I list here only some of the salient, relevant articles.

Gollier, C. and M. Weitzman 2010. "How Should the Distant Future Be Discounted When Discount Rates Are Uncertain?"

Kahn, A. 1966. "Tyranny of Small Decisions"

Knight, F. 1921. *Risk, Uncertainty, and Profit*

Solow, R. 1991. "Sustainability: An Economist's Perspective"

III. Scrutinize the 34,000-Student Footprint: Stepping Way Back with Eyes Wide Open

A. Undertake as Given the UO's 34,000-Student Footprint.

B. Take as Given the 4 Parts of Policy Analysis 101¹⁷:

1. Part 1 (Descriptive: Conditions as they are: 23,000 students); Part 2 (Normative: Conditions as they should be: 34,000 students or Oregon Governor Oswald West's

¹² Field, B.C. 1997. *Environmental Economics*, Second Edition. San Francisco: McGraw-Hill Company, Inc. pages 116-117; US Environmental Protection Agency, 2000. *Guidelines for Preparing Economic Analyses*. September. page 21

¹³ Knight, F. 1921. *Risk, Uncertainty, and Profit*. Pg. 19-20 (Chapter VII: "The Meaning of Risk and Uncertainty" - Pg. 197-232)

¹⁴ In economics, with risk one can know the odds of an event occurring while with uncertainty one cannot.

¹⁵ Solow, R. 1991. "Sustainability: An Economist's Perspective."

¹⁶ In 2016-2017, I addressed risk, uncertainty, and climate change before the California Water Resources Control Board re *Hearing in the Matter of California Department of Water Resources and U.S. Bureau of Reclamation*, the so-called, "California WaterFix." <https://en.wikipedia.org/wiki/California_Water_Fix_and_Eco_Restore>. I expect to testify again on these topics in 2018-2019 before the same Board, though focused on San Francisco Bay's estuarine system.

¹⁷ Lincoln, A. *House Divided* speech (1858). *If we could first know where we are, and whither we are tending, we could then better judge what to do, and how to do it.*

PRELIMINARY

- criterion¹⁸); Part 3 (Explanatory: Why are conditions as they are?); Part 4 (Prescriptive: How to change conditions from 23,000 students to 34,000).
2. For the UO to get from where it is to where it apparently wants to be requires understanding the relevant explanations.
- C. The Two Hypotheses the UO Failed to Test, Thereby Committing Another Fatal Error
1. The UO Proposal's Implicit Hypothesis: My admittedly quick read of the UO Proposal tells me its authors have asserted, perhaps unwittingly, that with soccer fields intruding into the ecological system at issue¹⁹, the UO can gain a competitive edge in the national market for students in which it competes.
 2. My Just-Fabricated Hypothesis: My admittedly quickly crafted explanatory and prescriptive long-run plan for the UO, as yet unwritten, would instead put its proposed physical capital, including especially the soccer fields, elsewhere and instead join Eugene in a coordinated effort to optimize the singular comparative advantage of natural capital the two institutions share, namely, the proximate reach of the Willamette.

IV. Scrutinize How the UO and the City of Eugene Are Handling Their Joint Social Capital

- A. I focus here on the special part of social capital, namely, institutions.²⁰ The City and the UO share the benefits from the ecological system at issue. This system is a *local public good*²¹. I am confounded that the City of Eugene seems to have allowed a conditional use permit serve as the only official, interinstitutional touching in which it engages with the UO. This smacks loudly of Alfred Khan's tyranny of small decisions.²²
- B. The two institutions also suffer the spillover costs from global warming, an *international public bad*²³.
- C. Perhaps this institutional insularity makes sense in other matters. But in this matter, it's nonsense.

V. Most of The Main Sources on Which I Relied

Stanford University and Nobel Laureate economist, Kenneth Arrow
MIT economist Olivier Blanchard
University of Montana Dean of Forestry Arnold Bolle
University of Montana zoologist John Craighead
Brookings Institution demographer and Senior Fellow, William Frey

¹⁸ West, O. (1915). *No selfish interest should be permitted, through politics or otherwise, to destroy or even impair this great birthright of our people.*

¹⁹ Recall in Part II, I describe the ecological system at issue as "an ecological system composed of adjoining riverine, riparian, and land subsystems."

²⁰ Blanchard, O. and D. Johnson. (2017) *Macroeconomics*. p. 254.

²¹ A *local public good* is an asset or activities "whose benefits are largely confined to local residents." In the matter at hand, "residents" include the UO's faculty, students, and staff.

²² Kahn, Alfred E. (1966) *Tyranny of Small Decisions*.

²³ An *international public bad*'s costs "transcend the boundaries of individual countries."

PRELIMINARY

University of Chicago economist Frank Knight
University of Montana botanist Joseph Kramer
Abraham Lincoln
Oregon Governor Tom McCall
Yale University economist William Nordhaus
MIT and Nobel Laureate economist Paul Samuelson
MIT and Nobel Laureate economist Robert Solow
Columbia University and Nobel Laureate economist Joseph Stiglitz
Harvard University economist Martin Weitzman
Oregon Governor Oswald West
and others

VI. Quals Relevant to This Matter

- A. Undergrad: U of MT (1959-63) and Yellowstone Park research station (late summers, 1961-62). Began in forestry, continued de facto in forest botany, watershed systems, and field zoology & ornithology (grizzlies, elk, golden eagle, falconry (honorary member of the Montana Peregrine Institute)); graduated in math, econ & poli sci.
- B. Doctorate, econ: MIT & Harvard (1963-68).
- C. Teaching econ, including enviro and urban: U of OR 1967-today; U of Nairobi 1970-71.
- D. Studying ecological systems: Peru (1969-70, ecology of the Andean condor); Kenya-Tanzania (1970-71, various ecological systems); Oregon (1974-75, Oregon coast and south slough estuarine systems); NSF Forested Long-Term Ecological Research sites (1996-97); Madagascar (2005-08, ecology of the ring-tailed lemur); Yap, Micronesia (barrier reef, lagoon, and mangrove systems).
- E. Affiliations and consulting
 1. Founder and head ECONorthwest (1974-2009); project director ECONorthwest (2009-2015); Founder, principal investigator and testifying economist FION 2015-today (website is work in progress). FION works closely with ECONorthwest.
 2. Consulting, advising and testifying: 1974-today: environmental matters, e.g., Oregon coast (1974-75, Oregon Coastal Conservation and Development Commission; 2002, *New Carissa* grounding); Gulf and Gulf coast (1976-77, NSF; 2017 BP-Deep Horizon oil spill); Exxon *Valdez* oil spill (1989-02); northern spotted owl matters (1991-92); ground & surface waters (CA, LA, TX, OK, MN, OH, NYC); rivers and aquifers (Willamette, Santiam, Columbia & Snake, Hudson, Sacramento (twice), San Joaquin, Klamath, Mississippi, Missouri, OK Superfund, etc.).