

What is the Worth of Wind?



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Estimating the Economic Value of Personal Windsports in the Columbia River Gorge: An Individual Travel Cost Approach

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The Individual Travel Cost Model

Assumptions:

- Non-market goods may give users a benefit, so they have economic value.
- Cost of travel to a site is the implicit price for recreation.
- A user's benefits must at least equal the costs of taking the trip.
- Opportunity cost of time spent traveling to a site may be accounted for.

We can estimate consumer surplus for all users of a site.

What are “personal windsports”?

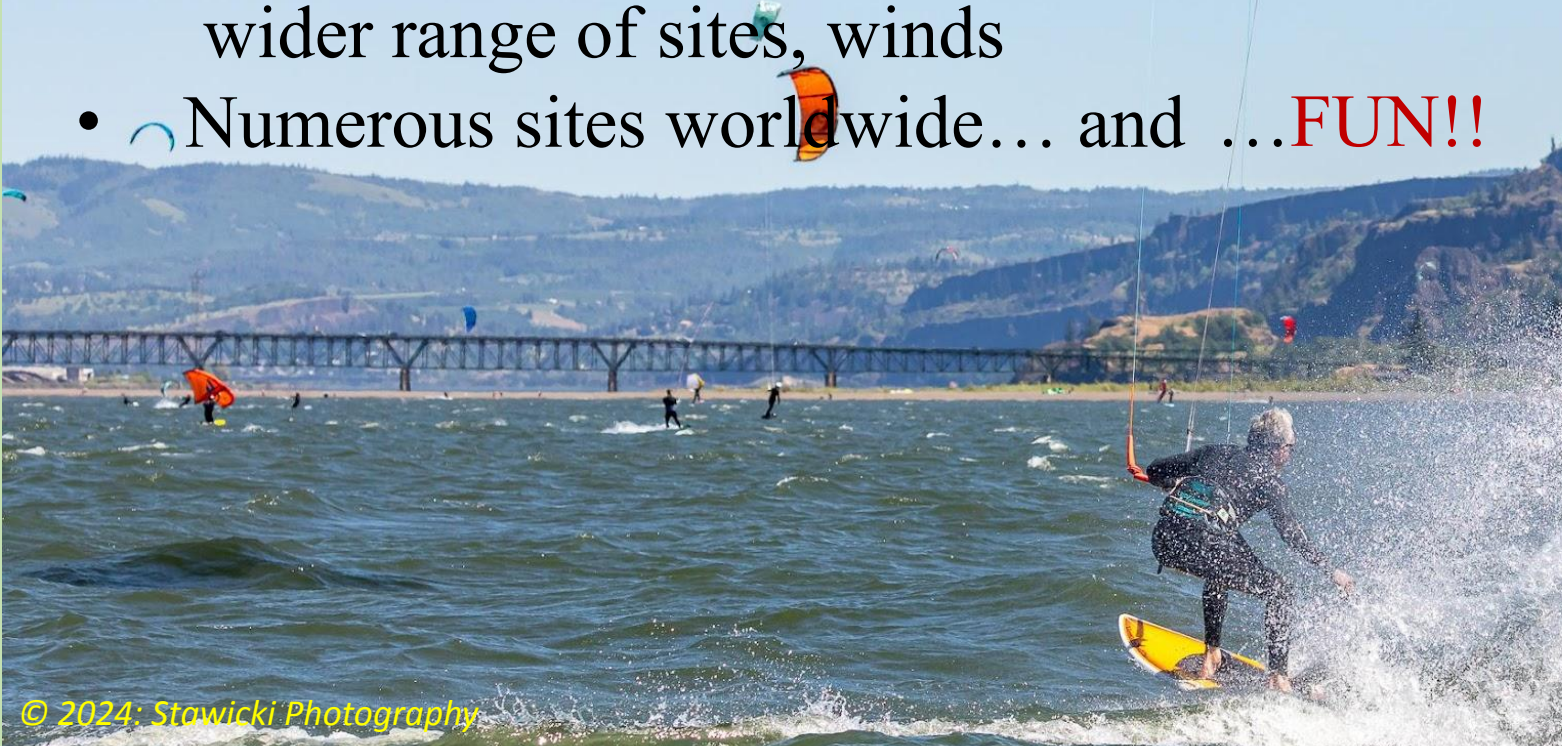
- Windsurfing: started in mid 1960s, includes centerboard, fin, hydrofoil variants.
- Kitesurfing: began ~1995 – surfboard, twintip, hydrofoil, several kite types.
- Wingfoiling: became available in 2019, always with a hydrofoil (so far).



Key features of personal windsports:

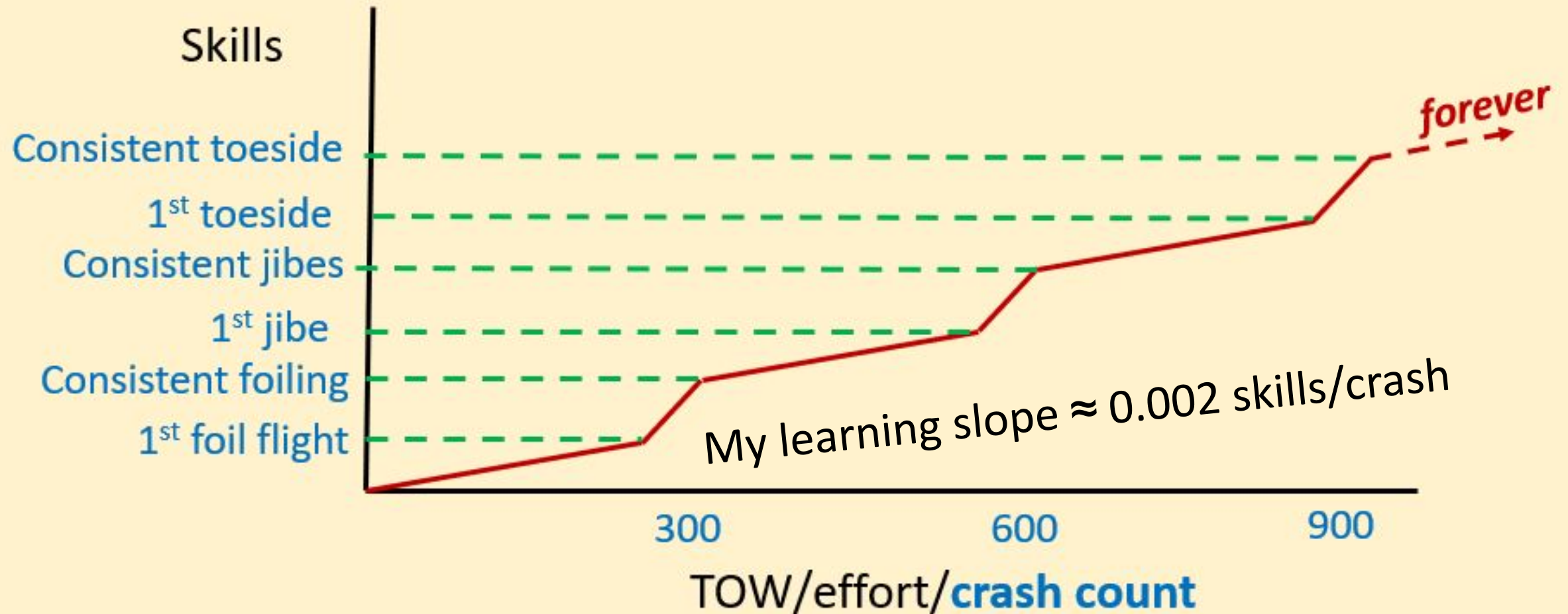
- Autonomous, portable, uses natural outdoor power source
- Relatively inexpensive
- Physically/mentally challenging, good workout, but possible to do for many hours in a “session.”
- Wide range of conditions
- Wingfoiling in particular: versatile, compact, opens up wider range of sites, winds
- Numerous sites worldwide... and ...**FUN!!**

<https://youtu.be/krR1jclNW6g?si=UKSRmLREymIjN2IL>



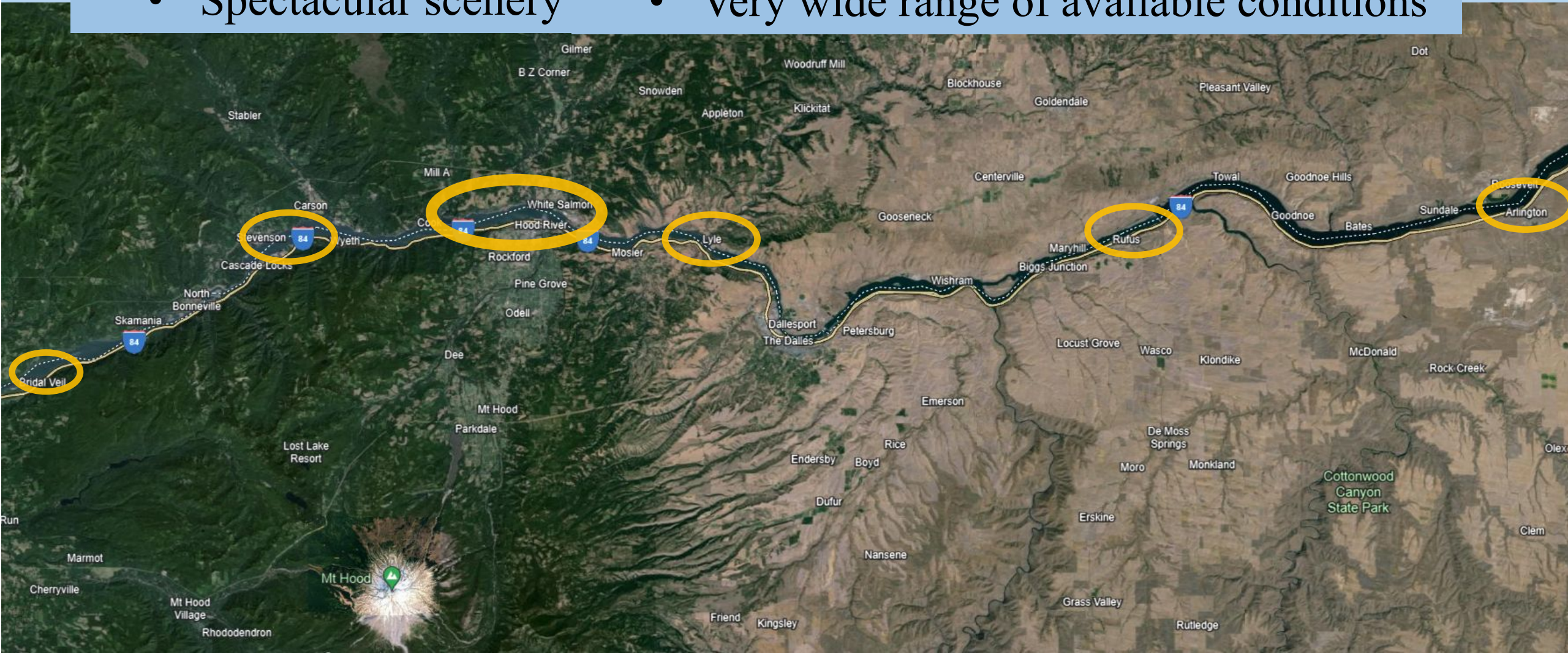
How hard is it to learn?

From *Wing-foilers over 40* FB group: “Can taxi on flattish water, but as soon as I begin to foil, the board just squirts away from me – it’s like trying to stand on a tea tray balanced on the back of a greasy dolphin.”



Columbia River Gorge/Hood River: a world windsports destination

- Reliable, strong winds
- Long season – May to September+
- Current typically opposite to wind direction
- Pleasant climate
- Spectacular scenery
- Very wide range of available conditions





Columbia Gorge Windsurfing Association

The CGWA was founded in 1987, and together with our members and supporters, has made great strides toward improving windsurfing amenities in the Gorge. Some of our accomplishments include:

- Building Rowena, Viento, Doug's Beach, Jensen, and Blackberry Beach
- Creating Gorge Groms: providing gear and clinics for local & visiting
- Contributing to the river access ramp at the new Waterfront Park
- Hosting fun events like Windfest, King of the Hook, and swap meets

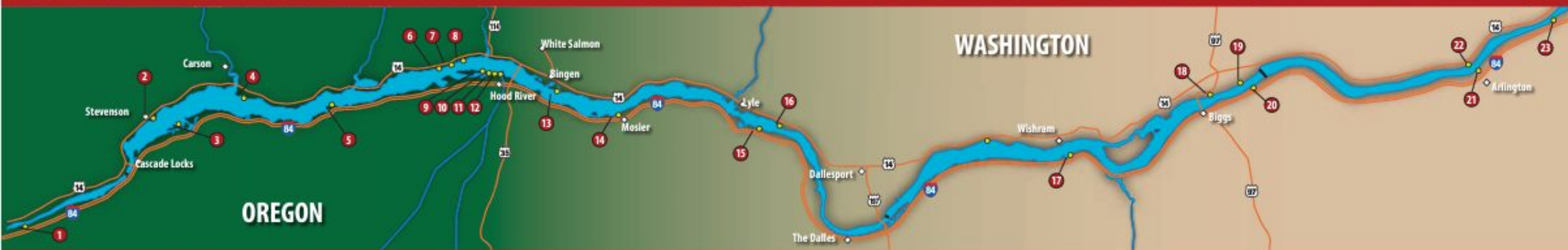
...and much more! See photos from our projects online at gorgewindsurfing.org

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[@gorgewind](https://twitter.com/gorgewind)

- | | |
|--------------------|--|
| Parking | Beginner |
| Restrooms | Intermediate |
| Kite Launch | Advanced |
| Camping | <small>Parking fees subject to change.</small> |







Our Comparative/Pilot Survey

- La Ventana, BCS, Mexico – February-March 2024 high season
- Similar mix of windsports
- Travel destination, even if not in the ranks of Maui or The Gorge
- Test of survey questions – about 100 responses



**ENCUESTA DE RECREACIÓN
DE DEPORTES DE VIENTO**

¿Eres un wingfoiler, kitesurfista
o windsurfista adulto?

Por favor, responde a la breve encuesta
que se enlaza a continuación por un
estudio de investigación. Solo le tomará
de 5-10 minutos.

**WIND SPORTS
RECREATION SURVEY**

Are you an adult wingfoiler, kitesurfer,
or windsurfer?

Please take the brief questionnaire linked
below, for an academic research study. It
should take only 5-10 minutes.




CONTACT/CONTACTO


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https://www.qualtrics.com/jfe/form/SV_2HLR1K8gYkA06



**COLUMBIA GORGE WIND SPORTS
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Bob Stawicki photo. <https://www.iwasphotographed.com/>



Kristen Jones photo

Why flock to La

- Reliable north wind, ~ Dec.-March
- Relief from calm/cold of El Norte
- Established business/instruction/local acceptance
- Fairly inexpensive travel/lodging



La Ventana Survey Issues/Challenges/Assets

↑ Isolated from alternative destinations

↑ Businesses amenable, esp. for academic survey

? Limited alternative activities

? 2nd language wasn't needed

? To our knowledge, first survey of this kind

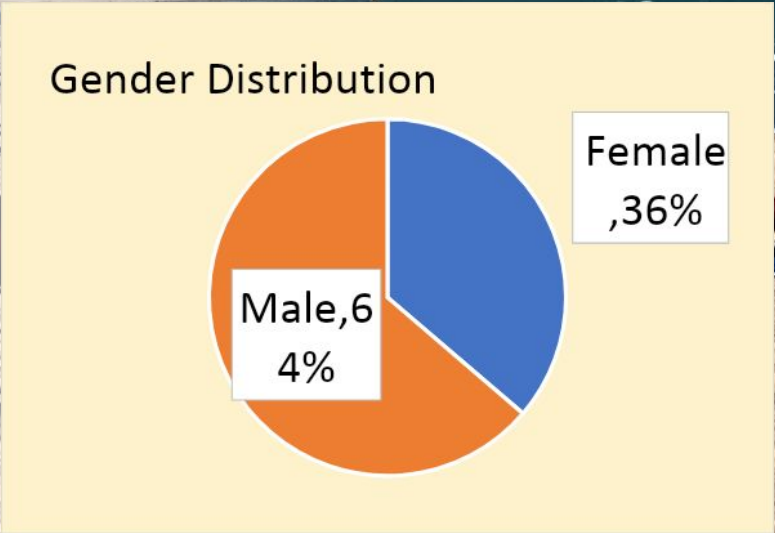
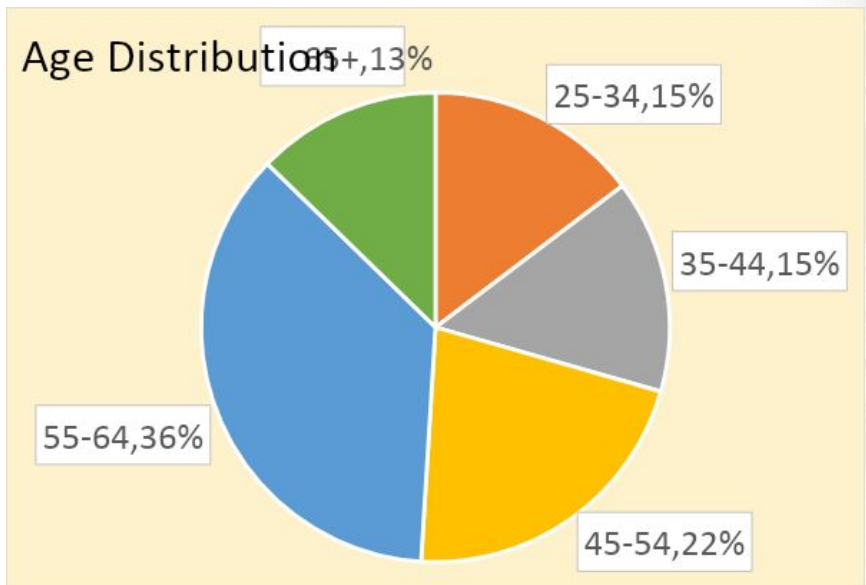
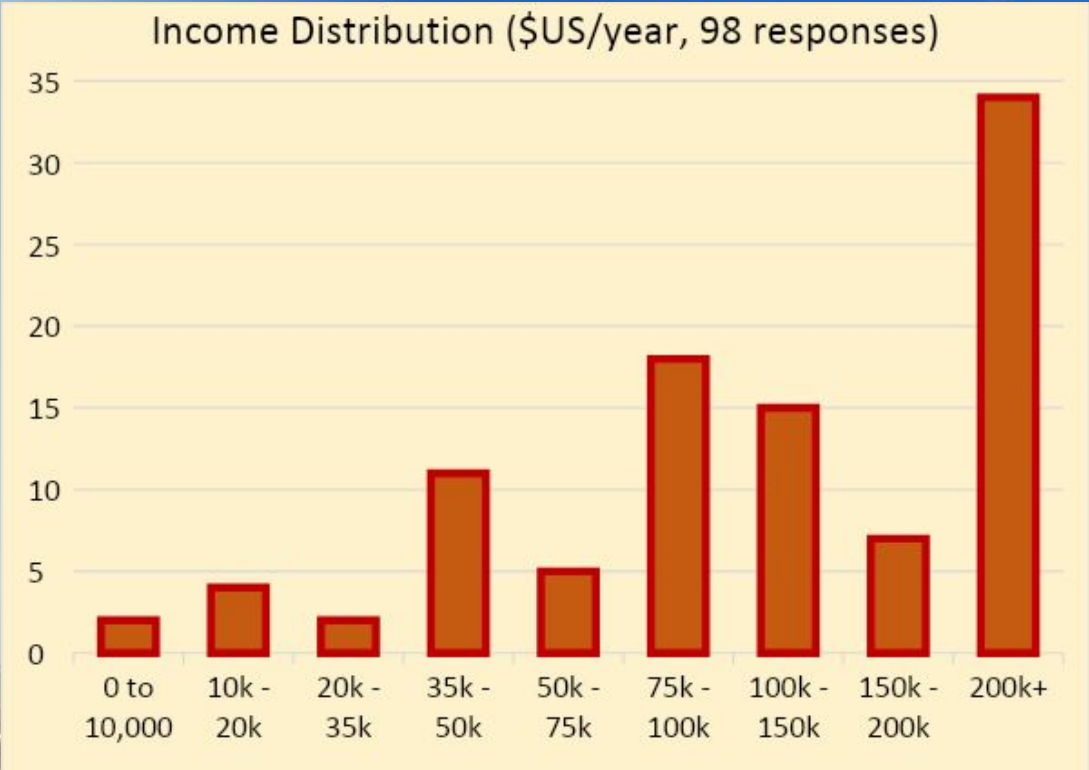
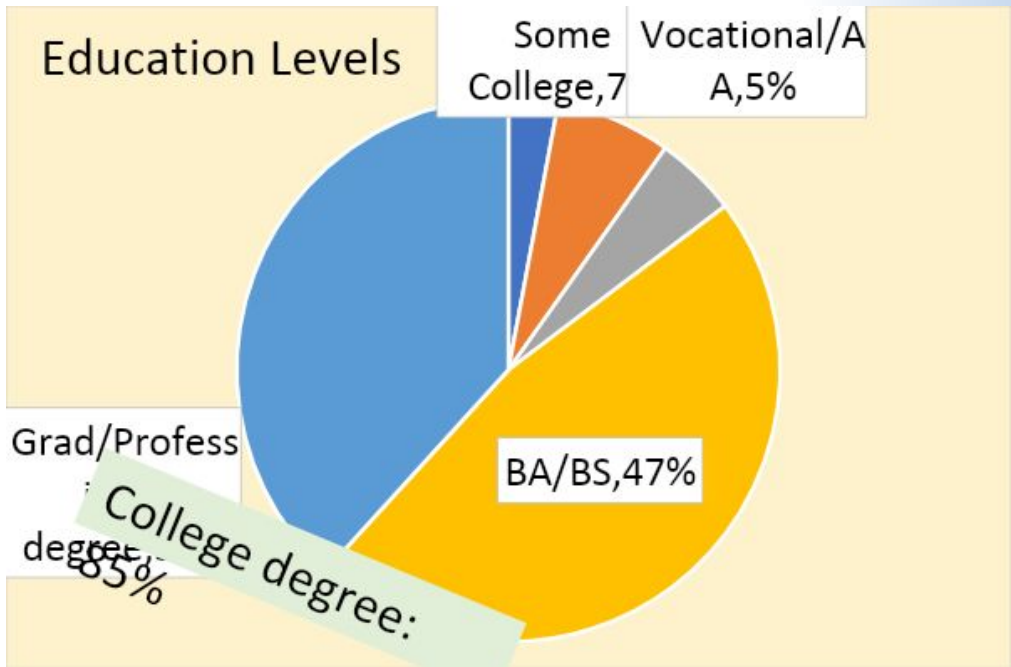
↓ Inexperience with Qualtrics

↓ Bimodal travel/stay options

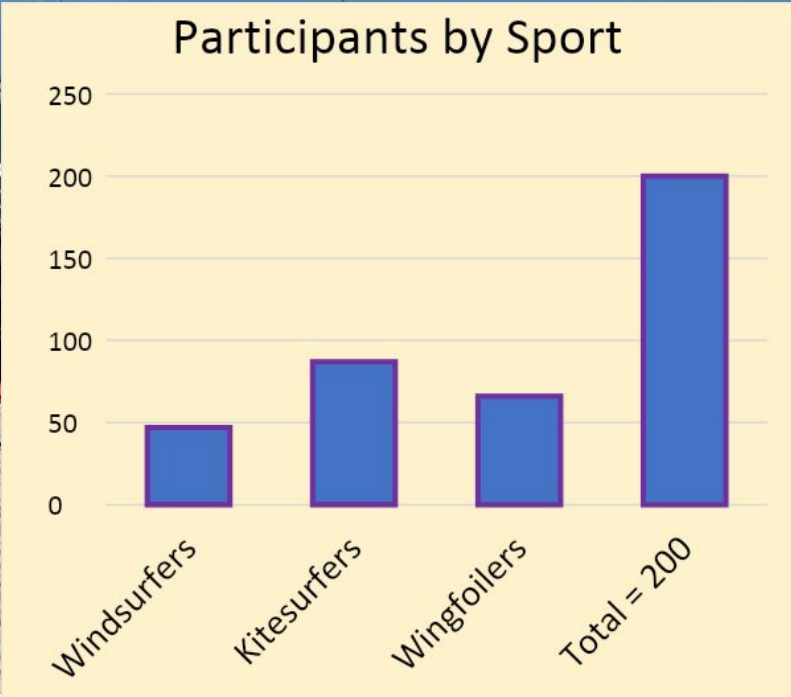
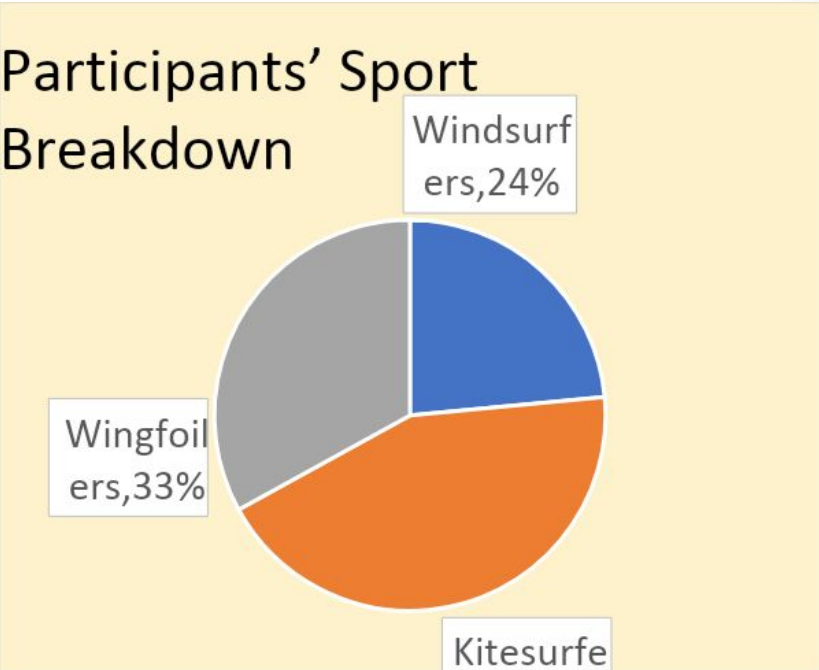
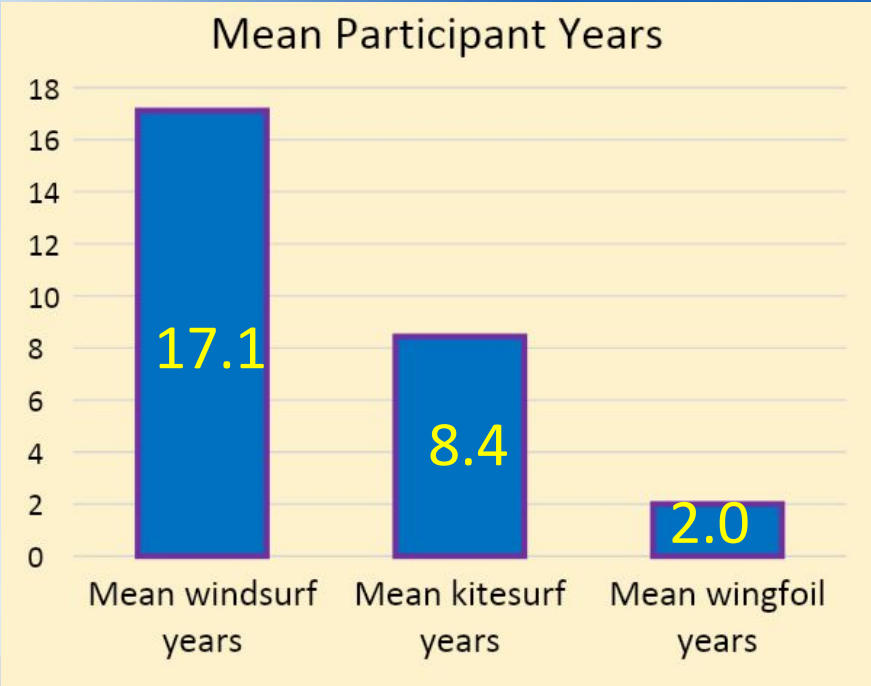
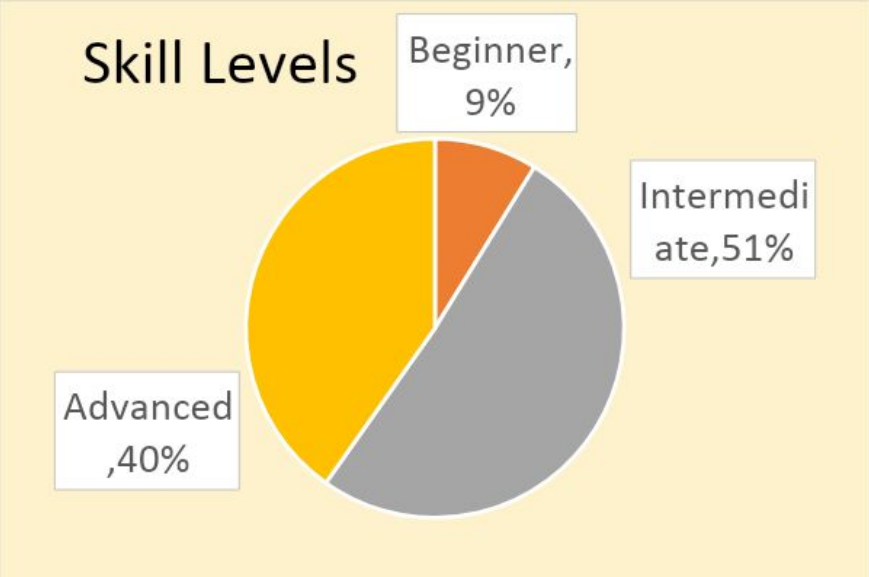
↓ What constitutes a “trip,” “visit,” or “session”?

↓ Have not found good estimate of annual participants

Demographics from La Ventana survey



Other data from La Ventana survey



A person is rock climbing a steep, reddish-brown cliff face. The climber is positioned on the right side of the frame, silhouetted against the bright orange and yellow light of a sunset. The climber is wearing a dark shirt, shorts, and a helmet. A rope is visible extending from the climber. The background features a deep valley with a winding river and a forest of evergreen trees. The sky is filled with soft, orange-hued clouds.

Estimating the Economic Value of Rock Climbing at Smith Rock: An Individual Travel Cost Approach

CASSANDRA KOEFOD

Cultural and Environmental Resource Management
Central Washington University

Photo: Albie Hartshill

Research Methods

- Calculate opportunity cost
- Remove outliers
- Correct for endogenous stratification

Poisson Regression:

$$\Pr(Y_i = y_i | \mu_i) = \frac{e^{-\mu_i}(\mu_i)^{y_i}}{y_i!} \quad (y = 0, 1, 2, 3, \dots)$$

Negative Binomial Regression:

$$f(y|\mu_i, \alpha) = \frac{\Gamma(y_i + \alpha^{-1})}{\Gamma(y_i + 1)\Gamma(\alpha^{-1})} \left(\frac{\alpha^{-1}}{\alpha^{-1} + \mu_i} \right)^{\alpha^{-1}} \left(\frac{\mu_i}{\alpha^{-1} + \mu_i} \right)^{y_i}$$

**COLUMBIA GORGE WIND SPORTS
RECREATION SURVEY**



Are you an adult windsurfer, kitesurfer, or foiler?

Please take the brief questionnaire for an academic research study (5-10 minutes).

CWU

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WELCOME TO ROCK CREEK



**This beach is open to all users.
Please be respectful and kind to others.**

- This is an advanced launch site and not suitable for novices.
- A windsurfer, kite or foil left at water's edge makes launching and landing more difficult for all.
- After launching please quickly move away from the shoreline into the river.
- After landing please move gear away from water's edge and out of the landing zone.

Have a great day at Rock Creek!
And thank you for keeping the Mosier in Rock Creek!

Map Legend



No Gear Allowed



Gear Allowed



Launch/Landing Zone

Regression Results from La Ventana Survey

Generalized Linear Model Regression Results

Dep. Variable:	visits	No. Observations:	59
Model:	GLM	Df Residuals:	55
Model Family:	Poisson	Df Model:	
Link Function:	Log	Scale:	
Method:	IRLS	Log-Likelihood:	-511.66
Date:	Mon, 13 May 2024	Deviance:	557.
Time:	21:14:19	Pearson chi2:	0.9962
No. Iterations:	7	Pseudo R-squ. (CS):	
Covariance Type:	nonrobust		

	coef	std err	z	P> z	[0.025	0.975]
totalCost	1.856e-05	9.43e-06	1.967	0.049	6.91e-08	3.7e-05
age	-0.4385	0.070	-6.250	0.000	-0.576	-0.301
female	1.1782	0.175	6.748	0.000	0.836	1.520
educ	0.2973	0.063	4.714	0.000	0.174	0.421
income	-0.1827	0.043	-4.251	0.000	-0.267	-0.098
wingfoilYears	0.6463	0.046	14.037	0.000	0.556	0.737

Leads to nonsensical
benefit/person-trip \approx -\$54,000

Regression Results from La Ventana Survey

Generalized Linear Model Regression Results

Dep. Variable:	visits	No. Observations:	29
Model:	GLM	Df Residuals:	22
Model Family:	Poisson	Df Model:	
Link Function:	Log	Scale:	
Method:	IRLS	Log-Likelihood:	
Date:	Wed, 15 May 2024	Deviance:	
Time:	14:44:14	Pearson chi2:	283.
No. Iterations:	7	Pseudo R-squ. (CS):	1.000
Covariance Type:	nonrobust		

	coef	std err	z	P> z	[0.025	0.975]
Intercept	9.2995	1.322	7.036	0.000	6.709	11.890
totalCost	-0.0002	0.000	-2.275	0.023	-0.000	-3.24e-05
age	-0.6824	0.098	-6.938	0.000	-0.875	-0.490
female	0.9248	0.301	3.071	0.002	0.335	1.515
educ	-1.1416	0.191	-5.963	0.000	-1.517	-0.766
income	-0.2388	0.061	-3.887	0.000	-0.359	-0.118
wingfoilYears	0.5619	0.074	7.596	0.000	0.417	0.707

Leads to more plausible
benefit/person-trip = +\$5,000

Challenges of TCM in general

- “...there is a considerable literature documenting that welfare estimates generated by TCM are sensitive – sometimes alarmingly so – to the discretionary analytical choices of researchers.”
- Wide variation in costs of durable travel/recreation equipment. Difficult, arbitrary cost allocation to particular trips.
- Cost allocation to specific sites during multi-purpose trips.
- Discretionary components of food/lodging expenses.
- How to treat substitute sites/activities?
- TCM treats distance, \$/mile as exogenous, but home location may be influenced by recreation preferences.
- Unclear opportunity cost of travel time. Scenery during trip? Music, podcasts?

“A Difficulty with the Travel Cost Method,” Randall, Alan, *Land Economics*, Feb. 1994, 88-96

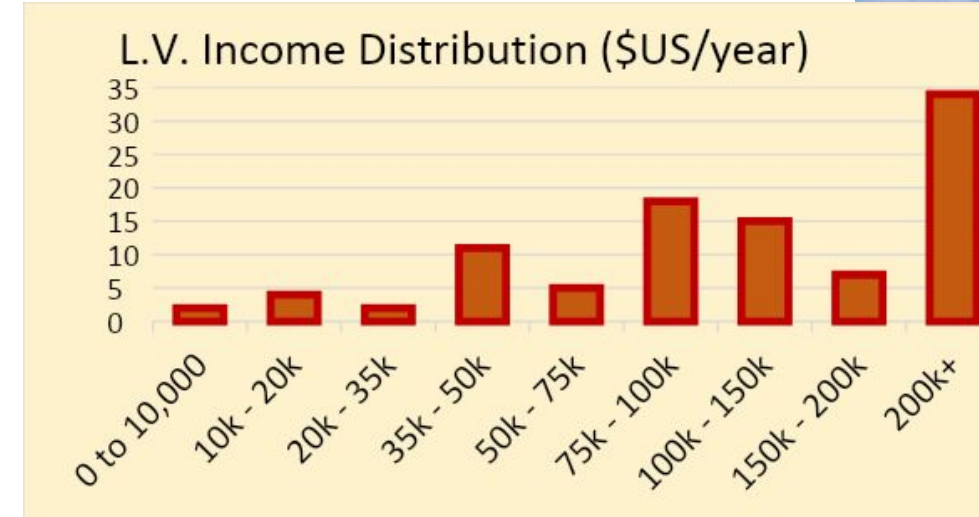
Lessons from La Ventana survey to apply to The Gorge

- Many questions need to be clarified; a few can be eliminated.
- Added a question about where respondents learned of the survey.
- Clearer instructions, to help avoid response errors.
- Raised and expanded income range.
- Changed age question from age ranges to “enter birth year.”
- Need estimate of annual participants.

Q27

21. What is your personal annual income in US dollars? Please check one income range (no personal info will be shared).

- ☐ Under \$20,000
- ☐ \$20,000 – \$39,999
- ☐ \$40,000 – \$59,999
- ☐ \$60,000 – \$79,999
- ☐ \$80,000 – \$99,999
- ☐ \$100,000 – \$149,999
- ☐ \$150,000 – \$199,999
- ☐ \$200,000 – \$299,999
- ☐ \$300,000 or more



Unresolved issues with survey design

- How to distinguish short vs. long-term visits, and allocate costs.
- How to spread out equipment costs – mainly for locals and migrators.
- Allocating lodging, food costs for short-term visitors.
- Filtering participant categories without adding too many questions.
- For frequent local participants, how to count trips without double-counting.



Questions?

