PRICING LANDSCAPE QUALITY
THE INFLUENCE OF LANDSCAPE VIEWS ON PROPERTY VALUES

Dr Andrew Lothian, Scenic Solutions
April 2014

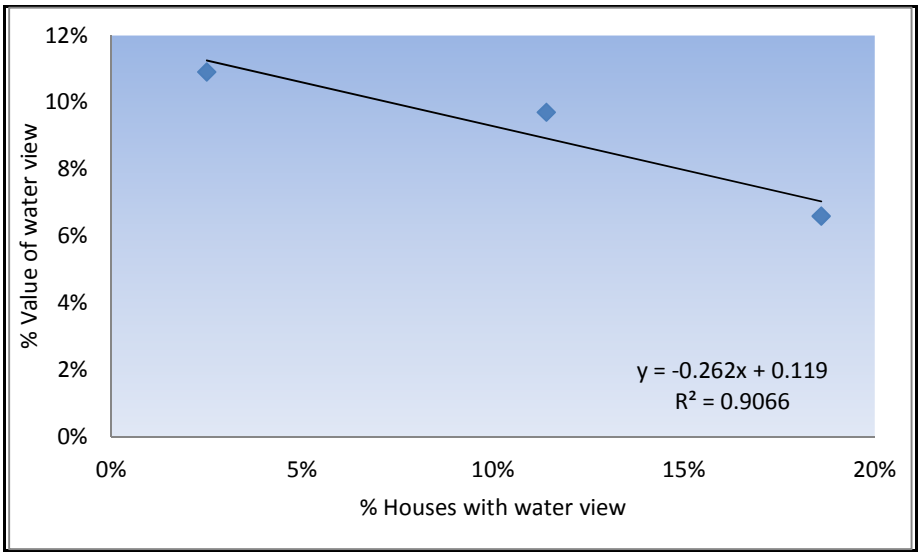
Real estate values provide an excellent surrogate for valuing landscape quality in monetary terms. In this paper a review is provided of studies into the effect of landscape views upon house values.

House values and the effect of landscape views upon them will reflect the laws of demand and supply prevailing at the particular location. In an area with an abundance of scenic beauty but a low population, the values may be low whereas the presence of a large population will generally increase demand and hence values.

This was reflected in a study in New Zealand (Bourassa et al, 2005) which found an inverse relationship between the relative abundance of a water view and its effect on house values, the fewer the views, the higher the contribution (Christchurch), and the converse – the more abundant the views, the lower the contribution (Wellington) (Table 1, Figure 1).

Table 1 Relative abundance of view vs contribution to house value

	Wellington	Auckland	Christchurch
% of houses with water view	18.6%	11.4%	2.5%
Influence of water view to house prices	6.6%	9.7%	10.9%



Source: Bourassa et al, 2005

Figure 1 Inverse relationship between abundance of view and contribution to house value

With this proviso in mind, studies of the influence of landscape views on property values do provide useful insights.

The Appendix summarises 27 papers covering 43 studies between 1973 and 2012 that have quantified the influence of landscape views on house values. Most of the studies examined the influence of water views on house prices, using the sea or lakes as the landscape and assessed the presence or absence of a view. All but two studies used actual sales data in preference to valuation data. Most studies used hedonic price analysis, a form of regression analysis where the price (dependent variable) is a function of the house characteristics (independent variables) such as number of bedrooms, floor area, air conditioning, etc to

derive the contribution of each to the price. The presence or absence of a view is included in the model.

The mean increase to house values for all studies is 17.4% but with a large standard deviation of 20%. Thus a property worth, say $200,000, will be worth $234,800 if it has a good view. Multiply this by the hundreds, or in some areas, thousands of properties which enjoy the view, and its worth runs to millions of dollars. Based on an average house value of $200,000, the value of the view for 1000 homes will be $34.8 million.

The increase to house values ranges from 2.18% to 90% and is heavily skewed towards the lower percentage as shown in Table 1 and Figure 2 (median 8.9%, mode 8%). Of the 37 separate study locations, 22 increased house values by up to 10%.

Table 1 Frequency of % increase in house values

% Increase	Frequency
0 - 4.99	4
5 - 9.99	18
10 -19.99	6
20 - 29.99	2
30 - 39.99	3
40 - 49.99	0
50 - 74.99	3
75 - 100	1

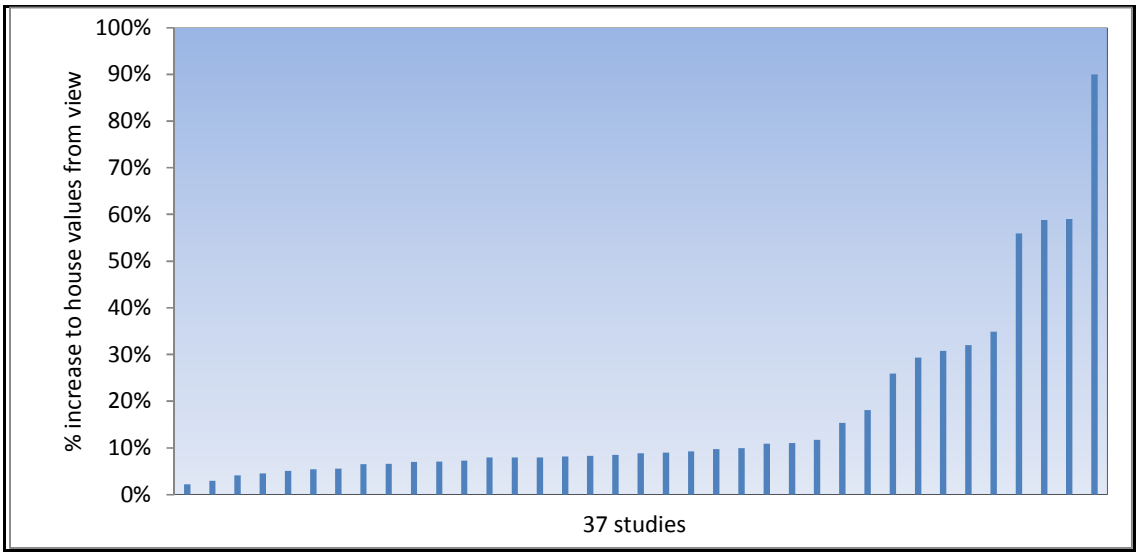
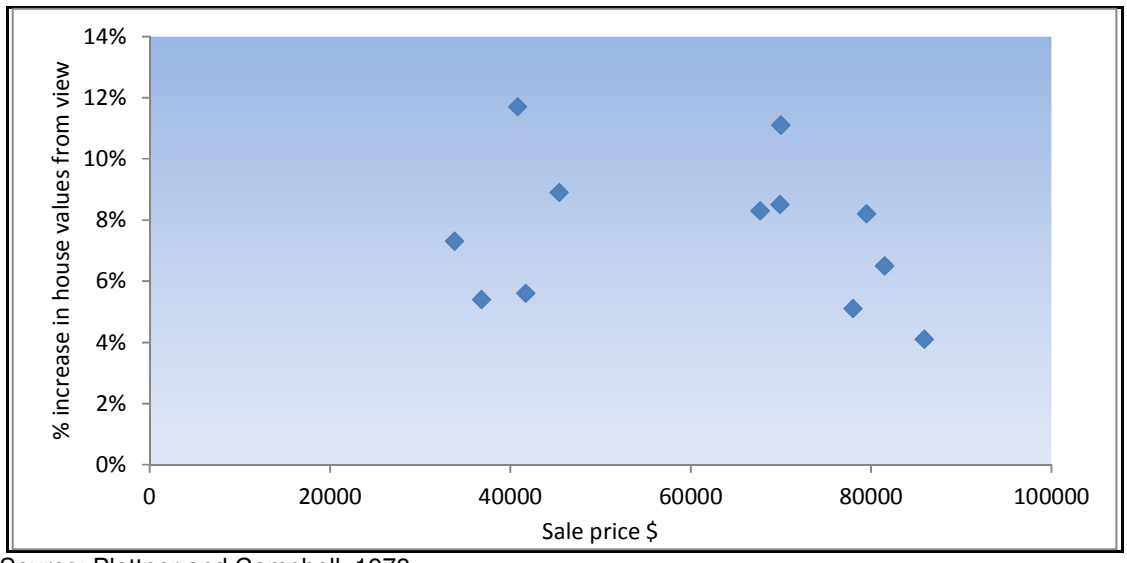


Figure 2 Studies of influence of a landscape view on house values

The highest increase, 90%, was derived in a study of houses along Lake Erie where houses with a view of the lake averaged $527,184 compared with $285,518 for those without a view. After controlling for house characteristics (e.g. lot size, house size) the premium added to homes with a view was $256,545. The authors wrote with academic understatement: “This is quite a large premium even given the spectacular view that Lake Erie offers.” (Bond, *et al,* 2002). This is clearly an example where the demand and capacity to pay is high but the supply is limited.

There appeared to be little or no relationship between the actual house value and the contribution of the view to that value. Figure 3 shows the results of a study of condominiums

near Boston where the contribution ranged from 4% to nearly 12% across the range of house values.



Source: Plattner and Campbell, 1978

Figure 3 Influence of water view on price of condominiums, Massachusetts

A study in Switzerland examined the profit derived from two hotels in and near Zurich that offered views over the lake and Alps compared with views without these (Lange, E. and P.V. Schaeffer, 2001). It found for one hotel an annual difference of US$0.45 m and for the other US$1.74 m. In present value terms, these added $4.3 m and $16.3 m to their property value (interest rate 10%, time period 20 years).

Baranzini and Schaerer (2007) examined rents in Geneva, Switzerland and found, using a large data base and GIS, that every additional hectare of a view of natural landscapes increased rents by 0.25% (US$3.2/ha) while a water view increased them by 0.47% (US$6/ha). A view of distant mountains increased rents by 0.05% (US$0.6/ha).

A study of rental apartments in Chicago in the mid-1970s found that the amenities in the area – access to parks and lake, and lake view, comprised 26% of their rents, including 7% for the lake view (Pollard, 1982). The author concluded that the "presence of either a lake view or accessibility to the lake leads to a doubling of the predicted height of buildings. These results for Lake Michigan are indicative of the substantial impact of topographic amenities on the height of buildings, the supply of housing, and the structure of cities".

Sander and Polasky (2009) examined the environmental influences on nearly 5,000 properties in Ramsey County in central Michigan in the US. The mean value was $255,955. They found the views increased house prices by 2.2 – 2.9 % (Table 2).

Table 2 Contribution of environmental qualities to house prices, Michigan, 2005

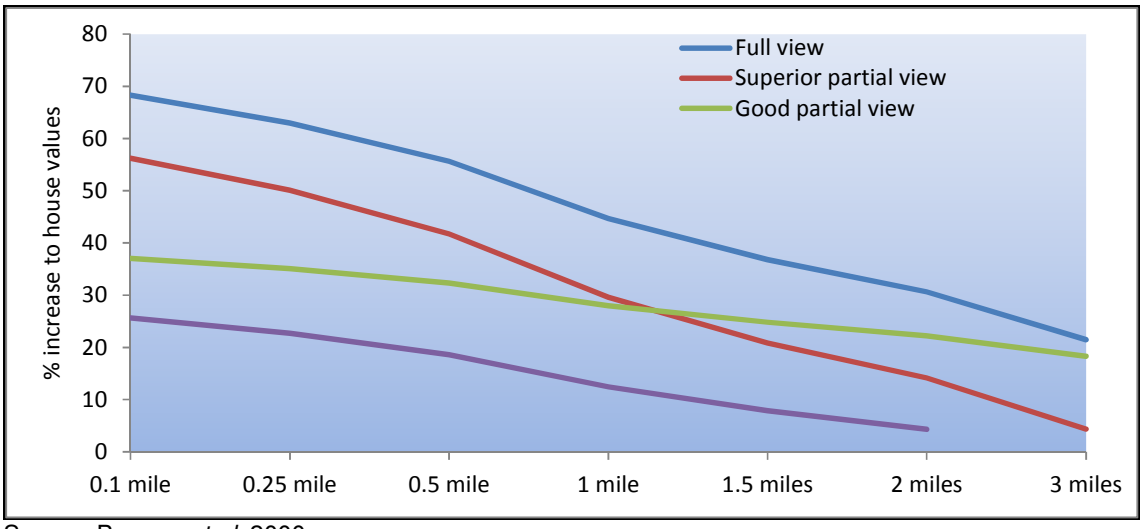
Change	Increase US$ 2005	% of av price
10% increase in view of grassy surfaces	5517	2.16
10% increase in view of water	7417	2.90

The extent of a view varies widely from a full expansive view covering the entire landscape through partial views to no view. It also varies by distance from the landscape being viewed, generally the more distant the view the lesser its influence on house prices. A study at Bellingham, Washington, which classified the extent of an ocean view (superior, good, poor) and distance found the value of a view varied inversely with distance from the water (Benson

et al, 2000) (Table 3, Figure 4). The study showed that the significant contribution of the view to house values decreases quite quickly within the first mile but then declines less quickly, meaning that a landscape viewed from even a considerable distance will generally still contribute to property values, unless the view is very restricted.

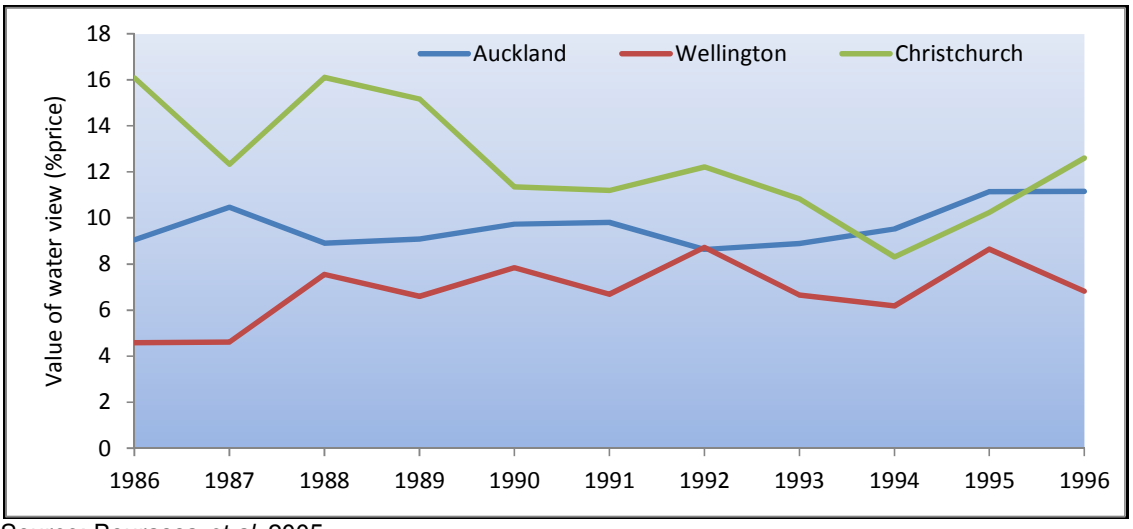
Table 3 Percentage increase to house values based on distance of view

Type of ocean view	0.1 miles	0.25 miles	0.5 miles	1 mile	1.5 miles	2 miles	3 miles
Full view	68.31	62.97	55.63	44.72	36.79	30.63	21.47
Superior partial view	56.21	50.09	41.78	29.59	20.86	14.16	4.35
Good partial view	37.03	35.05	32.28	28.01	24.8	22.23	18.29
Poor partial view	25.64	22.69	18.61	12.45	7.89	4.30	-1.12



Source: Benson *et al*, 2000

Figure 4 Percentage increase to house values based on distance of view



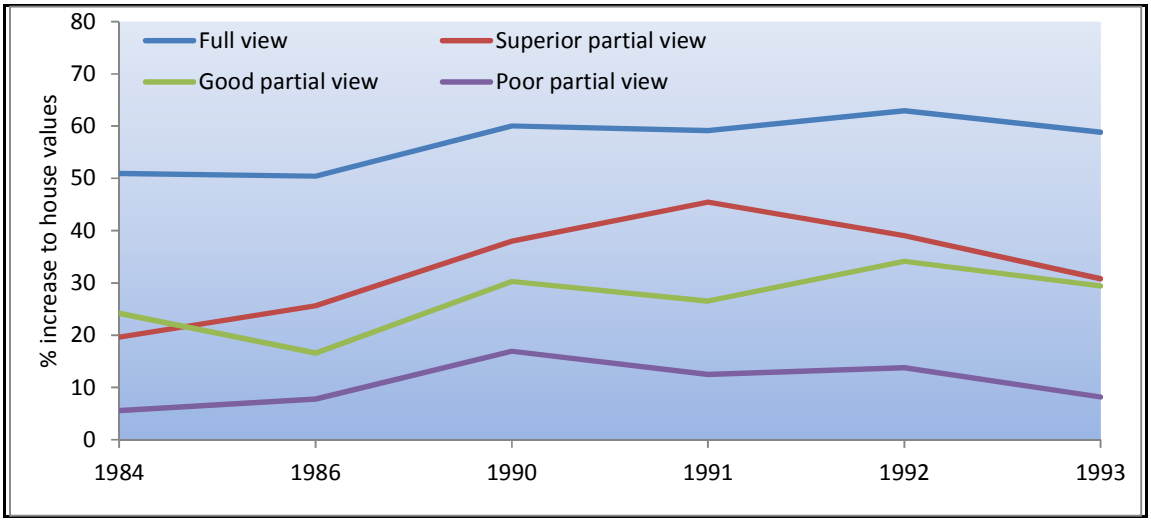
Source: Bourassa *et al*, 2005

Figure 5 Varying contribution of landscape view to house values over time (New Zealand)

The contribution of a landscape view to house prices is not constant, but in accordance with the laws of supply and demand, may fluctuate over time. This is shown by the study of New Zealand cities (Bourassa *et al,* 2005) which traced house sales by date (Figure 5). While the contribution was relatively constant for Auckland and Wellington both of which have

abundant sea views, it fell appreciably for Christchurch between 1986 and 1994 before making up for some of the decline by 1996. The decrease was probably due to new developments occurring nearer the coast and water features during the 1980s and early 1990s and supply being limited after 1994.

The study referred to above at Bellingham, Washington also traced the contribution of an ocean view over a decade and produced more stable results than the New Zealand study (Figure 6). It also found an appreciable increase in the contribution of the view to house values. For example, the contribution of the full ocean view rose from 51% to 59% over the decade, while the superior view more than doubled midway through the decade and then fell back to about a two-thirds increase by the end of the decade. This probably reflects the continuing demand for a view resulting in an added supply of suitable housing sites which reduced prices.



Source: Benson *et al*, 2000

Figure 6 Varying contribution of landscape view to house values over time (Washington)

Although most of the studies were carried out in Western nations with single storey family houses, five studies were of multi-storey apartment blocks in Hong Kong, Singapore and Guangzhou (China). The Singapore study (Shi Ming Yu et al, 2005) found a view of the sea increased apartment values by 15.4%. Two of the three Hong Kong studies found apartment values increased by 4.6% (Hui et al, 2007) and 9.3% (Tse, 2002). The third study found a broad sea view yielded an increase of 3.97% whereas confined sea views yielded 2.18%, not a large difference (Jim and Chen, 2009). However, this latter study also found that a broad mountain view lowered values by 6.7%, the reasons for which the authors speculated may be linked to the traditional Chinese view that regards water as fortune but mountains as wilderness. The Guangzhou study found that a view of green spaces near the apartments contributed 7.1% to their value.

Daniel, et al, 1989 used the Scenic Beauty Estimation method for measuring landscape quality together with camper's willingness to pay for camping trips to 35 forest areas with differing forest characteristics – tree ages, densities, stories and species. The found an almost perfect correlation (0.96) between scenic beauty estimates and the willingness to pay (Figure 7). This indicates that both scenic beauty and the willingness to pay were sensitive to the same variations in forest characteristics.

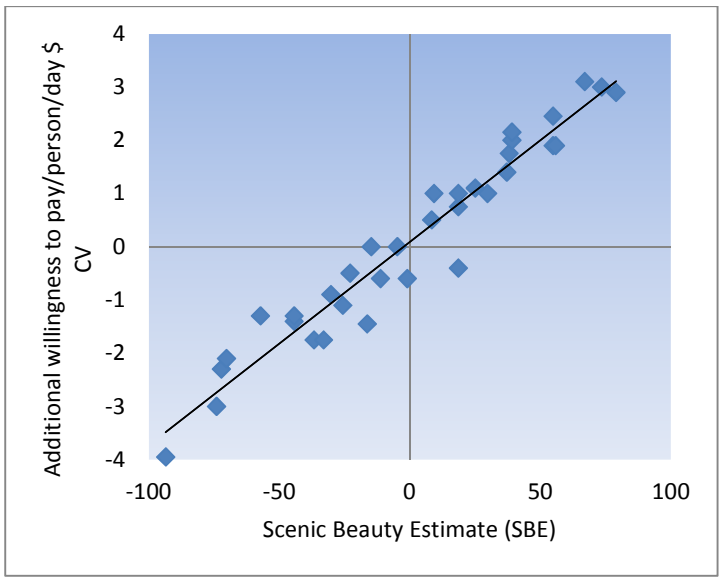


Figure 7 Relationship between perceived scenic beauty and willingness to pay for camping areas

SUMMARY AND CONCLUSIONS

The contribution of the view to house values ranged from 2% to 90% with an average of 17.4%. The amount reflects the laws of supply and demand; in locations with abundant views but little housing demand, the contribution may be slight but reverses where the demand increases with little supply. The contribution of a view did not correlate with the house value, the same contribution occurred for houses of low and high values. The value of a view varied inversely with distance from the view, declining quite rapidly over the first few kilometres before levelling out so that even distant views will provide some added value to house prices. The contribution of the view generally appreciated over time, presumably reflecting continuing demand but contracting supply of suitable land. While most of the studies were in the West (US, New Zealand and Holland), five studies in the East (Singapore, Hong Kong and Guangzhou) found similar results, ranging from 2% to 15%.

While not a perfect surrogate of the value of landscape quality, these studies demonstrate that house prices can benefit very significantly from a view of an attractive landscape.

REFERENCES

Baranzini, A. & C. Schaerer, 2007. A sight for sore eyes Assessing the value of view and landscape use on the housing market. Int. Conf. Reg. & Urban Modeling, Free University of Brussels, 1-2 June.

Benson, E., J. Hanson, A. Schwartz and G. Smersh, 1997. The influence of 'World Class Water' views on residential property values. American Real Estate Meeting, Lake Tahoe, Calif. 1996.

Benson, E., J. Hanson, A. Schwartz and G. Smersh, 1998. Pricing residential amenities: The value of a view. *Jnl Real Estate Finance and Economics*, 16:1, 55 -73. (Also: Benson, E., J. Hanson, A. Schwartz, 2000. Water views and residential property values, *The Appraisal Journal*, July, 260 – 271.)

Benson, E., J. Hanson, A. Schwartz and G. Smersh, 1998. The influence of Canadian investment on U.S. residential property values. *Jnl Real Esttae Research*. 13:3, 231 – 249.

Bond, M.T., V.L. Seiler and , M.J. Seiler, 2002. Residential real estate prices: a room with a view. Jnl Real Estate Research, 23:1/2, 129 -137.

Bourassa, S.C, M. Hoesli and J. Sun, 2004. What's in a view? *Environment and Planning A*, 36:8, 1427 – 1450.

Bourassa, S.C, M. Hoesli and J. Sun, 2005, "The price of aesthetic externalities." *Journal of Real Estate Literature*, vol. 13: 2, 167-187.

Daniel, T.C., T.C. Brown, D.A. King, M.T. Richards & W.P. Stewart, 1989. Perceived scenic beauty and contingent valuation of forest campgrounds. *Forest Science*, 35:1, 76 – 90.

Darling, A.H. 1973. Measuring benefits generated by urban water parks, *Urban Economics.* 49:1, 22 -34.

Davies, G., 1974. An econometric analysis of residential amenity. *Urban Studies*, 11, 217 – 225.

Gillard, Q., 1981. The effect of environmental amenities on house values: the example of a view lot. *Professional Geographer*, 33:2, 216 – 220.

Hui, E.C.M., C.K. Chau, L. Pun, M.Y. Law, 2007. Measuring the neighboring and environmental effects on residential property value: using spatial weighting matrix. *Building and Environment*, 42, 2333 – 2343.

Lange, E. and P.V. Schaeffer, 2001. A comment on the market value of a room with a view. *Landscape and Urban Planning*, 55, 113 – 120.

Luttik, J., 2000. The value of trees, water and open space as reflected by house prices in the Netherlands, *Landscape and Urban Planning*, 48, 161 - 167.

Morton, T.G. 1977. Factor analysis, multicollinearity, and regression appraisal models. *The Appraisal Jnl*, Oct, 578 – 588.

Plattner, R.H. and T.J. Campbell, 1978. A study of the effect of water view on site value, *The Appraisal Jnl.*, Jan, 20 – 25.

Pollard, R. 1982. View amenities, building heights, and housing supply, In Diamond, D, and Tolley, G. (Eds). *The Economics of Urban Amenities.* Academic Press, New York, pp 105 – 123.

Rodriguez, M. and C. Sirmons, 1994. Quantifying the value of a view in single family housing markets, *The Appraisal Jnl.* Oct, 600 – 3.

Sander, H.A. & S. Polasky, 2009. The value of views and open space: Estimates from a hedonic pricing model for Ramsey County, Minnesota, USA. *Land Use Policy*, 26, 837 – 845.

Seiler, M.J., M.T. Bond and V.L. Seiler. 2001. The impact of world class Great Lakes water views on residential property values, *The Appraisal Jnl*, 69:3, 287 – 95.

Tse, R.C., 2002. Estimating effects in house prices: towards a new hedonic model approach. *Urban Studies*, 39:7, 1165 – 1180.

Wolverton, M.L., 1997. Empirical study of the relationship between residential lot price, size and view. *Journal of Property Valuation and Investment*.15:1, 48 – 57.

Yu, Shi-Ming, Sun-Sheng Han and Chee-Hian Chai, 2005. Modeling the value of view in real estate valuation: a 3-D GIS approach. Dept Real Estate, National University of Singapore.

APPENDIX

STUDIES OF THE INFLUENCE OF LANDSCAPE VIEWS ON HOUSE VALUES

Reference	Location	Data date	Sales	Val'n	Number	$ added/ $ house value	% added
Darling, 1973	California Lake Murray Santee Lakes		☆			 +$2362 +$2756	
Davies 1974	Nottingham	1968	☆		114	-	
Morton 1977	California	<1975	☆		400	$19,748	
Plattner & Campbell 1978	Near Boston Knollsbrook Village Farrar Pond	1972 – 76	☆		 325 56	+$2.2k/$41.7k +$3.7k/$45.4k +$2.3k/$33.8k +$1.9k/$36.8k +$4.3k/$40.8k +$7k/$70k +$6k/$79.5k +$5.2k/$67.7k +$3.8k/$78k +$5.4k/$69.9k +$5k/$81.5k +$3.4k/$85.9k	5.6% 8.9% 7.3% 5.4% 11.7% 11.1% 8.2% 8.3% 5.1% 8.5% 6.5% 4.1%
Gillard, 1981	Los Angeles	1970	☆		392	+$3.9k/ $42K	9%
Pollard, 1982	Chicago	1975	☆		232	+$216/$3090 annual rent	7% on apartment rents
Daniel, Brown, King, Richards & Stewart, 1989	Forest campground areas	1985		☆	35	$7 over SBE range	CV correlated with SBE
Rodriguez & Sirmons, 1994	Virginia	1985 – 91		☆	194	+$22.5k/ $281k	8%
Wolverton, 1997	Tucson, Arizona	1989 – 91	☆		56	+$60,000/$173,000 (incl. lots with view)	34.9%
Benson et al 1997	Washington		☆		397		Ocean view 32% Partial view 10%
Benson et al 1998, and Benson et al, 2000	Bellingham Washington	1993	☆		5095 Distance vs effect	+$51.9k/$200k +$58.8k/$200k +$61.6k/$200k +$117.6/$200k +$36.2/$200k	View +25.9% Good partial ocean view 29.4% Superior partial ocean view 30.8% Unobstructed ocean view 58.8% Lake view 18.1%
Luttik 2000	Netherlands Emmen Apeldoorn Leiden	1989 – 1992	☆		 282 102 336		 Water view +10% Park view +8% Water view +8%
Seiler et al, 2001	Lake Erie	1998		☆	1172	+$115k/$292.5k	Water view +56%

Bond et al 2002	Lake Erie	<2000	☆		190	+$257k/$285.5k	Water view +90%
Garrod, 2002	Great Britain	2002		☆	416	£269 per annum for woodland view on urban fringe. Capitalised value £7,680 per property	
Tse, 2002	Hong Kong	1994	☆		1000	+$23.3k/$250.9k +$40.8k/$439.1k	9.3%
Bourassa et al 2004	Auckland NZ		☆		5,000		Water view + 59% to waterfront property
Bourassa et al 2005	Auckland, NZ Wellington Christchurch	1986 -1996	☆		128,982 28,357 73,851	Inverse rel. with % water view	Water view +9.7% Water view + 6.6% Water view + 10.9% Annual values avail.
Yu et al 2005	Singapore		☆		841	+$233k	Water view + 15.4%
Hui et al, 2007	Hong Kong	2000 - 01	☆		3000	US$8,208/$178,438 - $14,358/$312,131	Sea view 4.6%
Baranzini & Schaerer, 2007	Geneva Switzerland	2005	☆		10,396	Nat landscape +$3.2/ha additional view, water $6ha, mountains $0.6/ha	Nat landscape +0.25%/ha, water +0.47%/ha, mountains 0.05%/ha.
Sander & Polasky, 2009	Ramsey county, Michigan	2005	☆		4918 houses	10% increase view grass $5517 10% increase view water $7417	10% increase view grass 2.16% 10% increase view water 2.90%
Hui, Zhong & Yu, 2012	Hong Kong	2008-10	☆		2375	High rise apartments Seaview increased values of low & medium floors but lower for high floors	