

Do tourists use too much water, pay too little in taxes?

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Research into tourism, water, wastewater and solid wastes

- Growth in visitor numbers
- Increased demands for water, wastewater, solid waste services
- Need to fund operational costs and new services
- Studies of water, sewerage, and solids disposal and funding:
 - Westland 2000/01, Akaroa 2002/03, Kaikoura and Hanmer Springs 2003/04
- Micro data collection. FRST and MED/ CDC funding

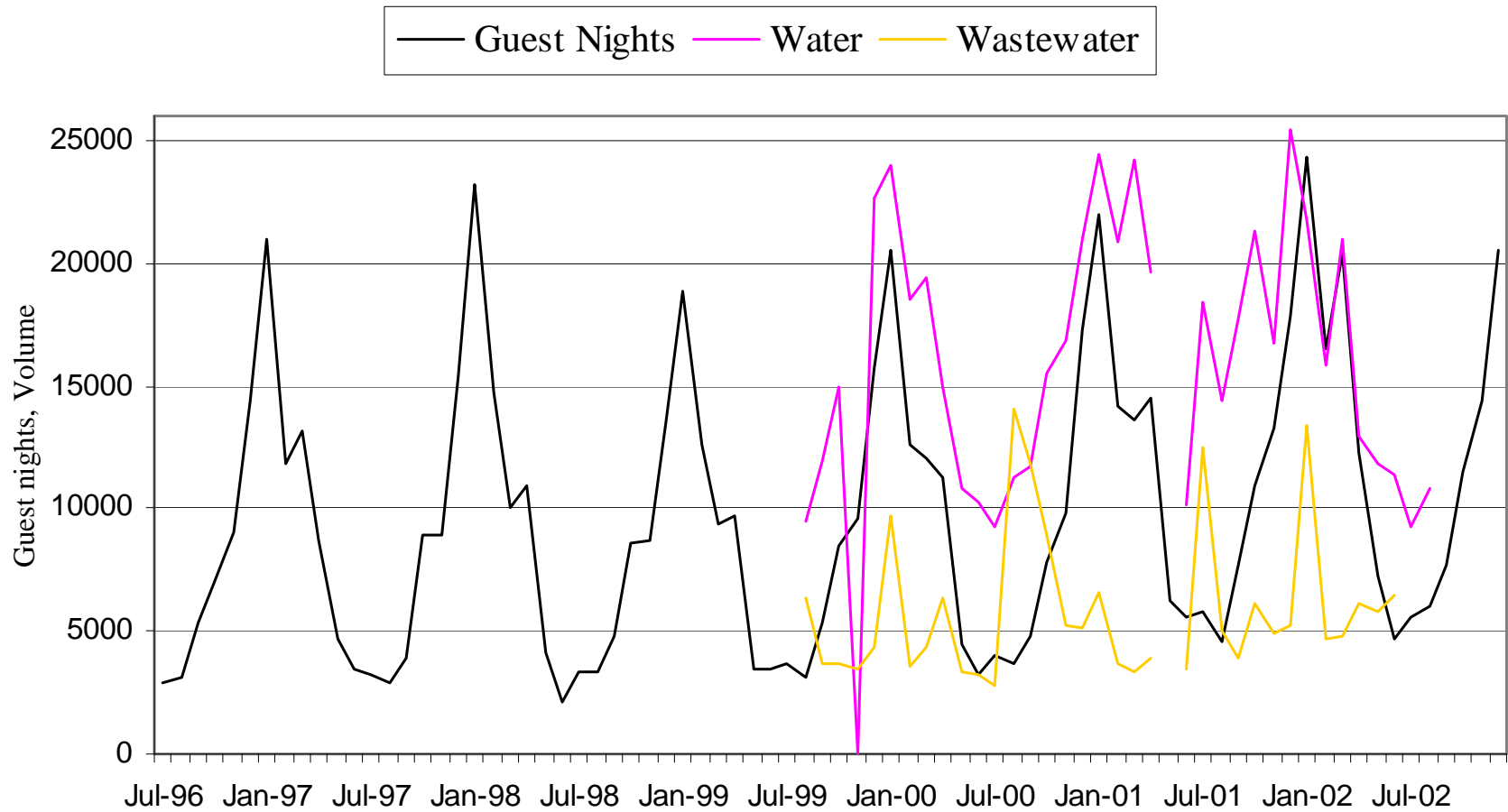
Tourism in Akaroa

Akaroa:

- 576 residents, 1010 rateable properties
- 900 houses, incl. 600 holiday homes
- Many day visitors
- Large visitor peak in summer



Tourism and Water/Wastewater Flow



Tourism in Hanmer Springs and Kaikoura

Hanmer Springs

- 660 residents
- Many day visitors, many holiday homes, stable visitor numbers

Kaikoura

- 2106 residents
- Many short stop visitors, few holiday homes, stable visitors /month
- Planned new developments – hotel, golf course, housing – will double town's water demand

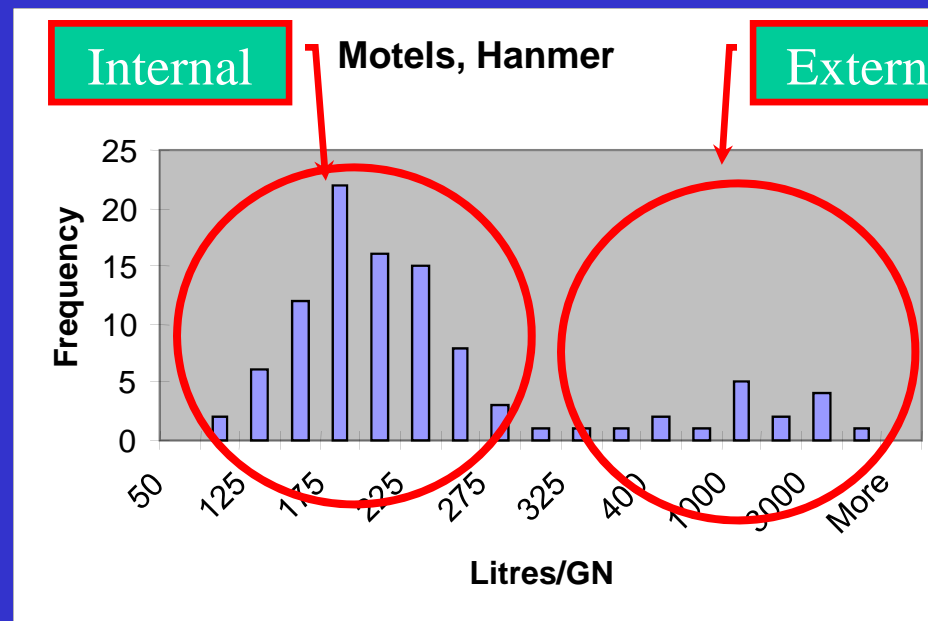
Variable water demands

Akaroa B&B, January,

L/GN:

- 170 (Thursday)
- 73 (Friday)
- 415 (Saturday)
- 3163 (Sunday –
water blasting to prepare
the building for painting)

Hanmer, Motels:



➤ Landscape watering on a B&B or motel garden could add 1 to 5 m³ to daily water user

Tourist related heavy users of water

- Public toilets – continuous flow urinals
- Hotels with bars and continuous flow urinals
- Garden watering – Akaroa
- Car wash at service stations



Heavy water users

Public toilets

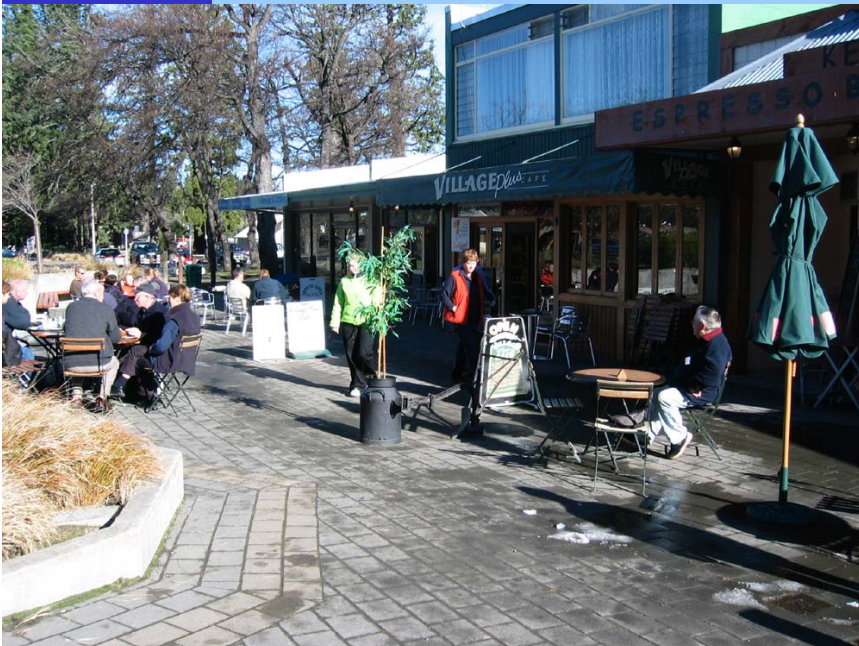
	Kaikoura m ³ /day	Hanmer m ³ /day
Mean	16.31	15.40
SD	2.06	8.76

Café

	Kaikoura m ³ /day	Hanmer m ³ /day
Mean	1.13	0.81
SD	0.19	0.22

Café with public urinal attached

	m ³ /day
Mean	12.20
SD	1.98



Thermal Pools – Hanmer

Thermal pool approx. 0.5 m visits /year

	m ³ /day
Mean	77.16
SD	11.70

Boat/car washing

- Widely perceived as heavy user of water
- Akaroa - volume of water used per boat-wash ranged from 85 litres to 600 litres with an average of 342 litres



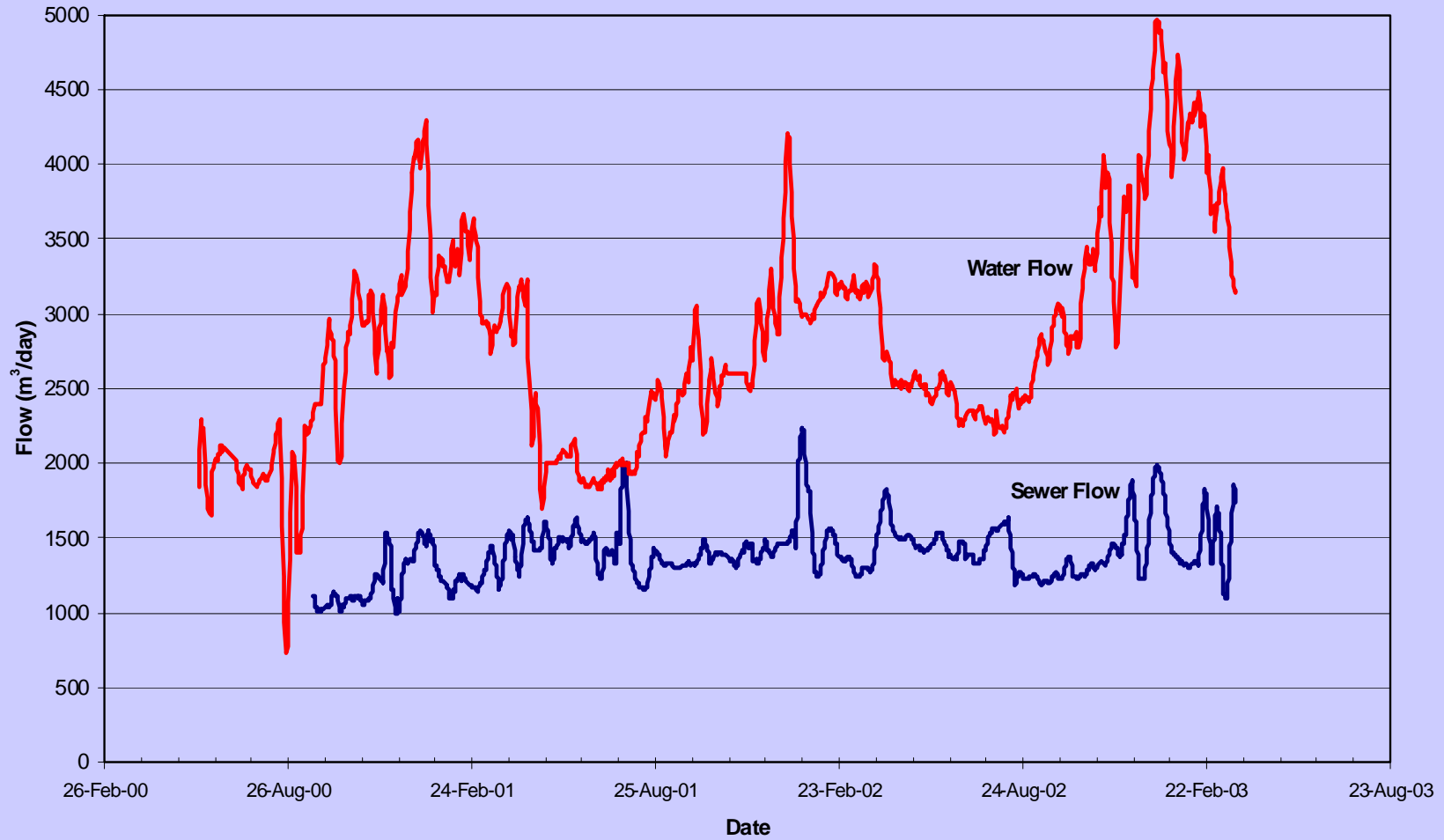
Relationship between water consumption and wastewater volumes

Distorted by:

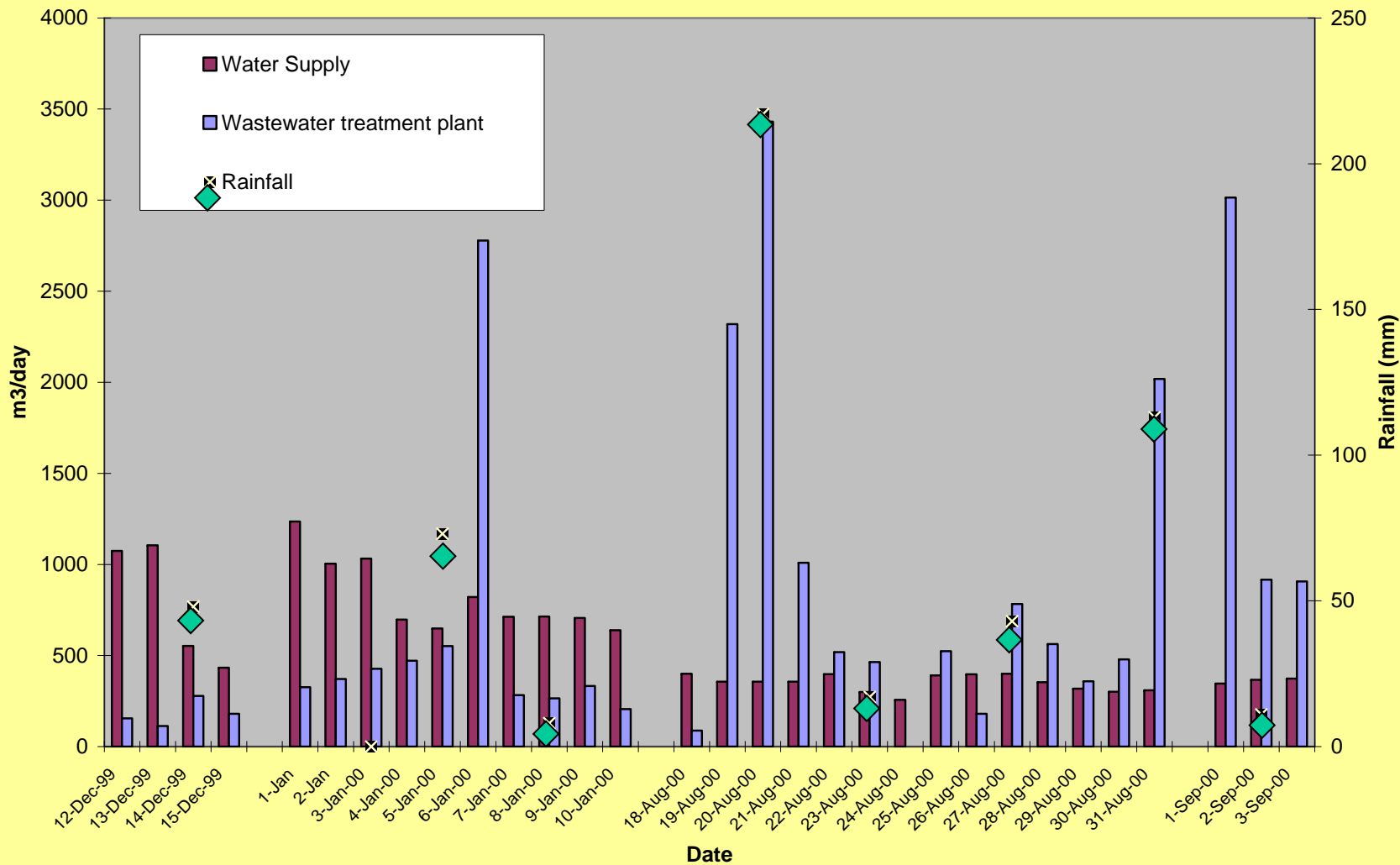
- External water use
- Leakage
- Stormwater infiltration



Kaikoura Water & Sewer Systems
Water Demands & Sewer Flows
(Seven Day Average)



Akaroa – effect of rainfall in causing stormwater infiltration



Sector water demands

Different for:

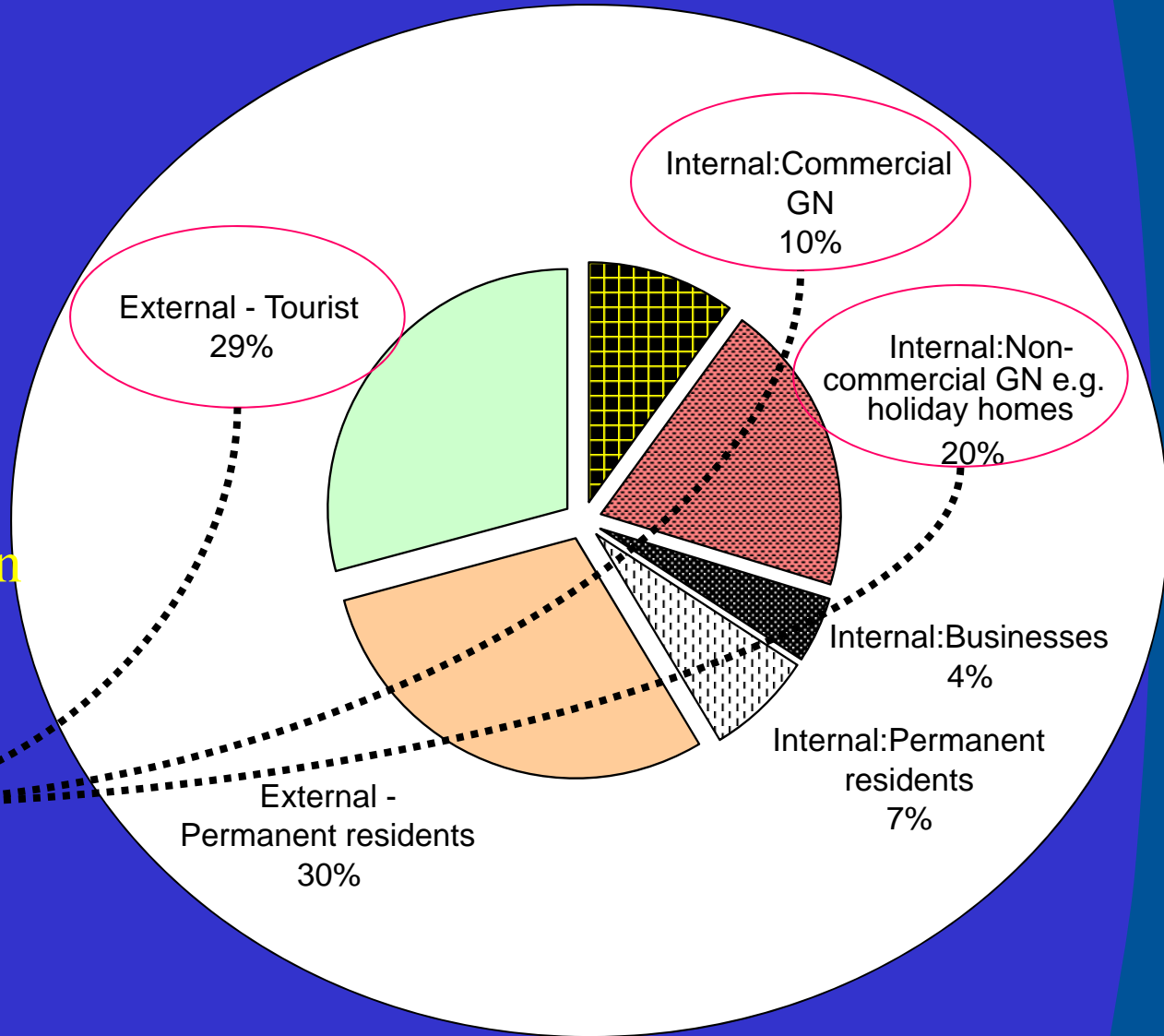
- Peak (daily) demand
 - drives capital costs of infrastructure
- Averaged demand (monthly)
 - drives operating costs

Akaroa: Peak sector water demand

Averaged monthly water demand

Aug 99 to Aug 02 mean monthly guest nights water consumption

➤ average annual tourist demand is 8.6%



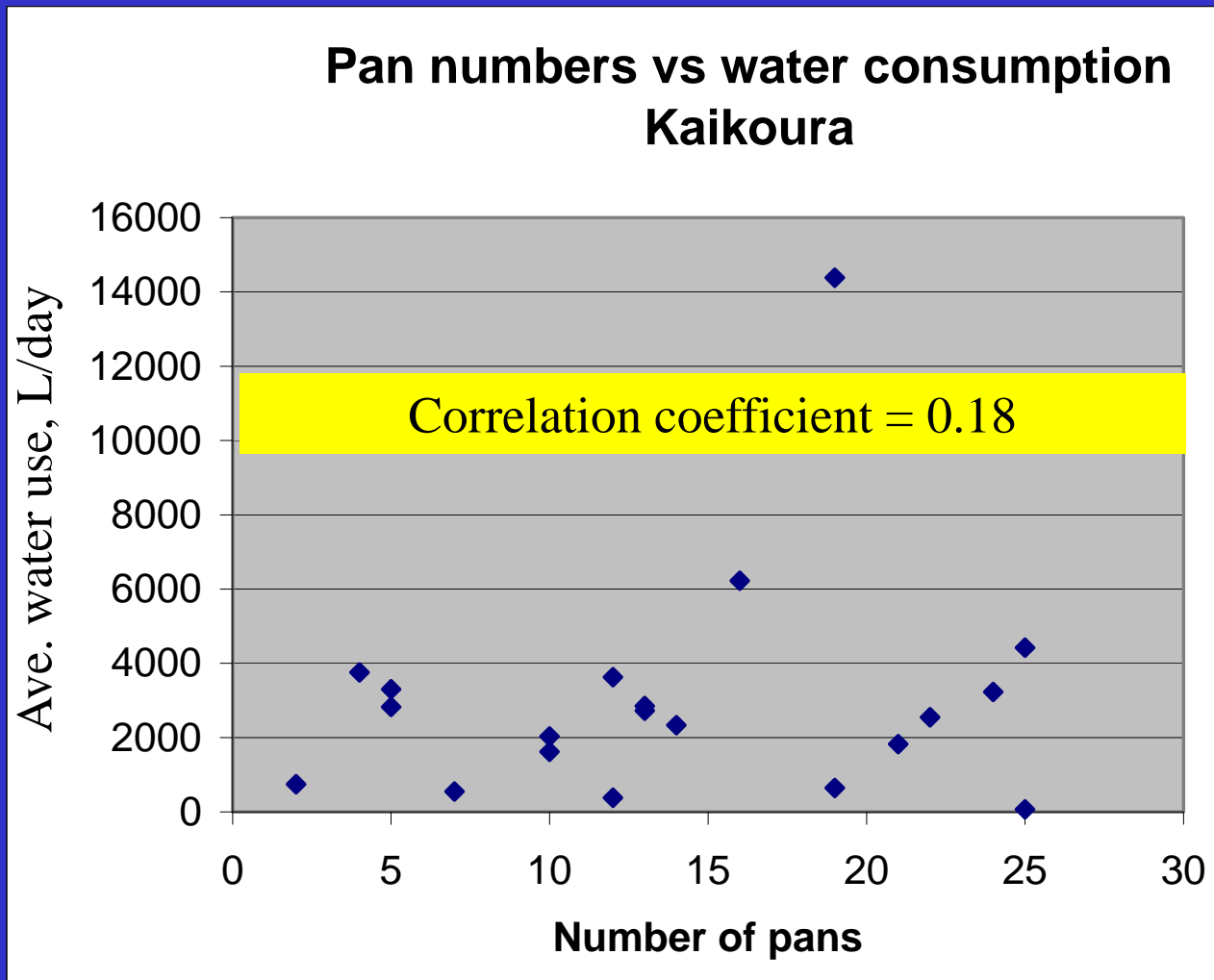
Interim results – 14 days of data

Hanmer, Kaikoura.

Peak tourist sector water demand

Town		Mean	Maximum	Minimum
Kaikoura		10%	14%	8%
Hanmer	Including thermal pools	52%	71%	34%
	Excluding thermal pools	41%	57%	25%

Pan numbers and wastewater yield



Kaikoura rates and charges

	2002/03	\$ total	2003/04	\$ total
UAC water	\$142.23	191 589	\$152.00	194 175
UAC water loans	\$84.57	118 398	\$80.26	119 503
Water charge (if metered)	\$0.45 / m ³		\$0.45 / m ³	
Pan charges	\$189.00 - \$47.28	256 361	\$189.00 if > 1: \$80.00	298 582
Sewage loans rate	0.00055c / \$CV	107 367	0.00044c / \$CV	90 484
UAC public toilets	\$32.07	62 026	-	-
UAC Refuse, recycle	\$83.40	161 297	Via UAGC \$396.70	792 606
Total revenue		897 038		1 495 350

Hanmer Springs rates and charges

	2002/03	\$ total	2003/04	\$ total
UAC water	\$120.00		\$121.00	Approx.
Water charges	\$0.4791/m ³		\$0.4285/m ³	190 000
Pan charges	\$67.00 \$33.50 \$16.75		\$67.00 \$33.50 \$16.75	67 655
UAC collection	\$65.00		\$55.00	36 231
UAC disposal	2 bags /week		\$1.50/bag	?
Total Revenue				293 886 +

Akaroa rates and charges

	2002/03	\$ total	2003/04	\$ total
UAC water	\$240.50	242 905	\$316.90	316 266
water charge (>300m ³ / yr)	\$0.89/m ³	11 950	\$0.89/m ³	12 000
UAC infrastructure	\$207.40	208 852	\$280.50	266 755
UAC sewage	\$80.10	89 837	\$18.50	103 183
Pan charges	\$80.10	89 837	-	-
UAC collection	\$47.30	45 171	\$45.60	42 315
UAC disposal	\$133.60	134 936	\$131.70	301 553
Total revenue		757 905		1 043 072

Share of costs, Akaroa 2002/03

	HH	RP	Com	Mo
Annual water, sewage, refuse rates paid	1.00	1.00	1.01	4.30
Annual water usage	1.00	5.70	3.70	32.5

<u>Without the holiday homeowners</u>	RP	Com	Mo
Annual water, sewage, refuse rates paid	1.00	1.01	4.30
Annual water usage	1.00	0.65	5.70

Akaroa Charges Evaluated

Hanemann's Criteria		Compliance	Justification
Revenue generation			
	Sufficient	Yes	The collected rates cover all costs.
	Stable over time	Yes	Predictable and no significant changes with water use.
	Administration costs & complexity	Costs only	Essentially flat rate and little differentiation between users.
Cost allocation			
	Non-arbitrary	No	Due to big first block of water.
	No cross subsidisation	No	High water users are subsidised as well as certain groups of users.
Incentive provision			
	Static efficiency	No	Big first block of water, no seasonal peak charges.
	Dynamic efficiency	No	High water allowance sets no incentives to change long-run behaviour.
	Encourage conservation	No	The lack of differentiated water charges sets no incentives to engage in water conservation.
	Correct interpretation	Partially	Transparent system, but no recognition of right incentives.

Rates and charging systems

General flaws:

- complex, weak incentives, cross subsidisation

Sewage:

- impractical to meter
- Evidence for correlation between water and sewerage m³ in other communities
- Combined water and sewage charges reduces complexity, eases administration

Do volumetric prices reduce water use?

- Price elasticity of demand for water is < 1.0
- Price elasticity is greatest during peak use periods, as more water use is discretionary
- Water meters & charges assist identification of leakages
- Water usage falls by 15+% with water charges/m³
- Water meters installed in Akaroa, December 2002
 - Peak water use summer 2003, 40% $<$ than 2002 peak

Proposed New Charges

- Same scheme for all ratepayers
- Combined water and wastewater charging
 - Wastewater as percentage of water demand
- Combination of fixed and volumetric charges
- Seasonal variation in water blocks and charges
 - E.g.: block limits may decrease and/or charges increase over summer/peak period

Improved water, wastewater rates systems

- Use two part pricing, for water + wastewater
- Fixed charge plus volumetric charge ensures
 - Sufficient revenue collected
 - Costs more accurately allocated
 - Incentives to conserve water, reduce wastewater
- Reduced demands on water and wastewater means
 - less demand for infrastructure
 - lower operating costs
 - less pressure on water sources, discharge sites
- Greater economic, social, and environment sustainability

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