

LAKE MENDOTA WATER QUALITY EFFECTS ON PROPERTY VALUES

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ACTIVITIES SINCE LAST MEETING

- SELECTED AND CLEANED NATIONAL ASSOCIATION OF REALTORS DATA FOR COMMUNITIES WITH SHORE FRONTAGE ON LAKE MENDOTA
- > PURCHASED AND CLEANED ADDITIONAL PROPERTY SALES DATA
- MERGED PROPERTY SALES DATA WITH CENSUS DATA, COMMUNITY DATA AND WATER QUALITY DATA
- **ESTIMATED FIRST PHASE HEDONIC MODEL**

HEDONIC MODEL

HOUSE PRICE = f(WATER QUALITY, OC)

$\triangle \text{HOUSE PRICE} = F(\triangle \text{WATER QUALITY}, \\ \text{OC MEANS})$



FOCUS ON OBSERVED DATA DURING SUMMER MONTHS IN THE FIRST PHASE

> SECCHI

> TOTAL PHOSPHOROUS

> CHLOROPHYLL

IDENTIFICATION

CORRELATION IS NOT OUR FRIEND

- MULTICOLLINEARITY (INFLATED VARIANCES)
- **OMITTED RELEVANT VARIABLES (BIAS)**
- > QUASI-EXPERIMENTAL DESIGNS
 - o **REPEAT SALES**
 - **O DIFFERENCE IN DIFFERENCES**
 - MATCHING



WATER QUALITY DATA DURING STUDY PERIOD

meanSECCHI

meanSECCHI during summer month





meanTP

HEDONIC MODEL

 $LN(PRICE) = \beta_0 + \beta_1 LN(SECCHI) + \beta_2 LN(TP) + \beta_3 DIST + \beta_4 LN(SECCHI) * DIST + B_5 LN(TP) * DIST + \beta_s S + \beta_L L + \beta_c C + \beta_T T + E$

• PRICE: SALE PRICE

- SECCHI: MEAN SECCHI DISK READING, SUMMER MONTHS AT SALES YEAR;
- TP : MEAN TOTAL PHOSPHOROUS, SUMMER MONTHS AT SALES YEAR;
- DIST: DISTANCE FROM PROPERTY TO LAKE MENDOTA;
- S: STRUCTURAL CHARACTERISTICS;
- L: LOCATION CHARACTERISTICS;
- C: DEMOGRAPHIC CHARACTERISTICS;
- T: ANNUAL TIME DUMMIES.

PROPERTY SALE LOCATIONS



PARAMETER ESTIMATES

Estimation results of key variables (Asterisk implies significant at 10%)

	Coefficient estimates
ln(SECCHI)	0.136*
ln(TP)	-0.097*
ln(SECCHI)*Dist	-0.000003
ln(TP)*Dist	-0.000002*
DIST	-0.00004*
WATERFRONT	0.497*

PRICE-WATER QUALITY RELATIONSHIPS

meanSECCHI



meanTP



GLM-HEDONIC COUPLING WATER QUALITY IMPROVEMENT SCENARIO

WHAT IF ANALYSIS: • meanSECCHI READINGS INCREASES FROM 2.67 TO 4.0 m

2.07 10 4.0

and

o meanTP DECREASES FROM 0.11 TO 0.3 mg/L



CAPITALIZED PRESENT VALUE OF CHANGES IN PROPERTY VALUES

HOW DO WE ADJUST FOR CHANGE THROUGH TIME AS WATER QUALITY CHANGES ARE NOT INSTANTANEOUS?

EXTRAPOLATING OVER THE COMMUNITY?

CONSIDERING CHANGES IN PROPERTY TAX REVENUES?

> ARE THERE OTHER CONSIDERATIONS MIKE WILL UNCOVER?

MOVING FORWARD

- **BASIC MENDOTA MODEL WORKING**
 - NEED TO EXPAND AND VALIDATE
- **PROTOCOL WILL BE APPLIED TO ONEIDA AND SUNAPEE**
 - **ONEIDA HAS MULTIPLE MONITORING STATIONS**
 - **O SUNAPEE LIMITED NUMBER OF SALES**





