

Data Repository item 2005107

**TABLE DR1. LIST OF YEARS WITH NO DATA AVAILABLE (I.E., WITH NO MONTHLY AVERAGE).**

Lake	Abbr.	No. of Years	Periods with no data available
<i>Ontario</i>			
	Cape	16	1899 - 1913, 1915
	Olco	2	1998- 99
	PWel	24	1932- 55
	Roch	44	1908- 34, 1936- 52
<i>Erie</i>			
	Buff	17	1870 - 1886
	Erie	2	1998- 99
	Marb	2	1998- 99
	Tole	27	1878 - 1903, 1909- 10
<i>Huron</i>			
	DeTo	40	1897- 98, 1900, 1904- 33, 1937- 43
	Lake	2	1998-99
<i>Michigan</i>			
	Holl	49	1898, 1901- 02, 1904, 1909- 34, 1936- 40, 1943- 55, 1957- 58
	Ludi	38	1898- 99, 1901- 02, 1907, 1909- 34, 1938, 1940- 43, 1948- 49
	StuB	6	1920- 21, 1923- 24, 1926, 1998
<i>Superior</i>			
	Dulu	6	1974- 79
	Gran	1	1998
	Onto	1	1998
	Poin	5	1945- 49
	TwoH	48	1888- 98, 1901- 29, 1932- 34, 1936- 40

TABLE DR2. COMPARISON OF RELATIVE VERTICAL VELOCITIES AND THEIR STANDARD DEVIATION IN CM/CENTURY  
BETWEEN GAUGES ON LAKE ONTARIO.

Gauge pair	Coordinating Com., 1977	Tait and Bolduc, 1985	Carrera et al, 1991	Tushingham, 1992	This Study Method 1	This Study Method 3
Burl	Cape				18.8 ± 1.8	20.0 ± 0.7
Burl	Cobo				13.5 ± 1.2	12.3 ± 0.8
Burl	Kngs				18.5 ± 1.7	22.5 ± 0.7
Burl	Olco				8.9 ± 0.9	8.7 ± 0.9
Burl	Oswe				13.9 ± 1.6	15.5 ± 0.7
Burl	PWel				4.4 ± 0.9	5.3 ± 0.8
Burl	Roch				13.3 ± 1.2	9.8 ± 0.7
Burl	Toro			21.2 ± 2.0	11.2 ± 1.0	7.9 ± 0.7
Cape	Cobo			-11.5 ± 1.9	-8.2 ± 1.5	-7.7 ± 0.4
Cape	Kngs	5.8 ± 0.6		-4.5 ± 2.2	2.4 ± 1.1	2.5 ± 0.2
Cape	Olco			-14.7 ± 2.6	-11.0 ± 1.4	-11.3 ± 0.6
Cape	Oswe	-2.1 ± 0.6		-2.8 ± 0.4	-4.8 ± 1.2	-4.5 ± 0.2
Cape	PWel			-12.2 ± 2.4	-14.9 ± 1.7	-14.7 ± 0.3
Cape	Roch			-7.7 ± 1.1	-8.2 ± 1.3	-10.2 ± 0.2
Cape	Toro	-11.6 ± 0.9		-11.2 ± 0.7	-12.1 ± 1.7	-12.1 ± 0.2
Cobo	Kngs			9.1 ± 2.3	7.9 ± 1.5	10.2 ± 0.4
Cobo	Olco			1.5 ± 2.4	-3.7 ± 0.9	-3.6 ± 0.7
Cobo	Oswe			6.8 ± 1.6	2.9 ± 1.4	3.2 ± 0.4
Cobo	PWel			-7.4 ± 3.1	-9.2 ± 1.0	-7.0 ± 0.5
Cobo	Roch			3.3 ± 1.3	0.2 ± 1.1	-2.5 ± 0.4
Cobo	Toro		-1.3 ± 1.0	-1.5 ± 1.6	-3.3 ± 1.0	-4.4 ± 0.4
Hami	Toro			0.8 ± 6.4		
Kngs	Olco			-7.4 ± 2.6	-10.0 ± 1.2	-13.8 ± 0.6
Kngs	Oswe	-7.9 ± 0.6	-7.6 ± 0.4	-7.5 ± 0.2	-1.2 ± 1.5	-7.0 ± 0.3
Kngs	PWel			-19.9 ± 2.8	-15.5 ± 1.6	-17.2 ± 0.4
Kngs	Roch			-6.0 ± 1.5	-7.7 ± 1.1	-12.7 ± 0.3
Kngs	Toro	-17.4 ± 0.9	-16.4 ± 0.6		-8.9 ± 2.2	-14.5 ± 1.6
Olco	Oswe				4.9 ± 1.6	5.2 ± 1.0
Olco	PWel				-6.6 ± 2.8	-5.6 ± 0.7
Olco	Roch				4.0 ± 1.5	5.1 ± 0.7
Olco	Toro		6.6 ± 1.5		3.9 ± 1.7	3.0 ± 0.7
Oswe	PWel				-9.5 ± 2.0	-9.9 ± 1.4
Oswe	Roch				-3.8 ± 0.5	-6.1 ± 0.4
Oswe	Toro	-9.4 ± 0.9	-8.8 ± 0.7	-8.5 ± 0.5	-11.3 ± 0.9	-5.6 ± 1.6
PDal	Toro			1.3 ± 0.6		
PWel	Roch				11.6 ± 2.4	9.0 ± 1.1
PWel	Toro				-0.6 ± 0.7	-1.3 ± 2.0
Roch	Toro				-5.5 ± 0.8	-3.5 ± 1.1

TABLE DR3. COMPARISON OF RELATIVE VERTICAL VELOCITIES AND THEIR STANDARD DEVIATION IN CM/CENTURY  
BETWEEN GAUGES ON LAKE ERIE.

Gauge pair	Coordinating Com., 1977	Tait and Bolduc, 1985	Carrera et al, 1991	Tushingham, 1992	This Study Method 1	This Study Method 3
Barc	BarP				-8.0 ± 4.2	-14.8 ± 2.5
Barc	Buff				6.3 ± 2.0	1.3 ± 2.1
Barc	Clev				-9.1 ± 3.3	-8.5 ± 2.1
Barc	Erie				-7.3 ± 1.6	-10.8 ± 2.4
Barc	Erio		3.8 ± 2.1		-9.3 ± 3.4	-8.3 ± 2.4
Barc	Fair				2.9 ± 2.5	-20.4 ± 3.0
Barc	Ferm				-9.7 ± 4.8	-8.3 ± 2.5
Barc	Kngv				-7.6 ± 4.2	-9.0 ± 2.4
Barc	Marb				-8.3 ± 4.6	-7.1 ± 2.4
Barc	Monr				-14.2 ± 5.1	-14.7 ± 6.3
Barc	PCol				-1.2 ± 1.8	-4.4 ± 2.2
Barc	PDov				-0.4 ± 1.5	-0.5 ± 2.4
Barc	PSta		4.6 ± 2.3		-9.4 ± 2.4	-6.1 ± 2.2
Barc	StuP				16.7 ± 1.9	3.4 ± 2.6
Barc	Tole				-7.8 ± 4.9	-7.3 ± 2.1
BarP	Buff		19.8 ± 5.9	18.7 ± 4.8	16.1 ± 1.4	
BarP	Clev		7.0 ± 3.7	9.0 ± 2.3	6.3 ± 1.4	
BarP	Erie		6.2 ± 4.9	-0.2 ± 4.1	4.0 ± 1.8	
BarP	Erio		6.8 ± 4.9	7.3 ± 2.2	6.5 ± 1.8	
BarP	Fair				-1.4 ± 2.8	-5.6 ± 2.6
BarP	Ferm				6.7 ± 1.7	6.5 ± 1.9
BarP	Kngv	2.0 ± 2.5	0.6 ± 6.0	5.6 ± 1.6	5.8 ± 1.8	
BarP	Marb		6.6 ± 3.2	7.0 ± 1.9	7.7 ± 1.8	
BarP	Monr				8.6 ± 2.3	0.1 ± 6.1
BarP	PCol				13.1 ± 4.6	10.4 ± 1.5
BarP	PDov		14.6 ± 5.0	14.5 ± 4.3	14.3 ± 1.8	
BarP	PSta		6.7 ± 3.7	5.5 ± 3.6	8.7 ± 1.5	
BarP	StuP		14.5 ± 7.9	19.1 ± 4.8	18.2 ± 2.1	
BarP	Tole	2.7 ± 2.7	4.7 ± 3.0	4.7 ± 2.2	7.5 ± 1.5	
Buff	Clev	-5.8 ± 1.2		-9.0 ± 0.5	-9.9 ± 4.5	-9.8 ± 0.3
Buff	Erie			-8.8 ± 2.1	-11.5 ± 2.1	-12.1 ± 1.2
Buff	Erio			-7.2 ± 3.0	-9.5 ± 3.8	-9.6 ± 1.1
Buff	Fair				-21.9 ± 2.9	-21.7 ± 2.2
Buff	Ferm				-12.3 ± 5.3	-9.6 ± 1.3
Buff	Kngv		-8.9 ± 4.3	-11.8 ± 4.6	-10.3 ± 1.2	
Buff	Marb		-7.3 ± 2.7	-9.1 ± 4.9	-8.4 ± 1.2	
Buff	Monr				-26.1 ± 5.5	-16.0 ± 5.9
Buff	PCol	-6.4 ± 0.9	-5.8 ± 0.4		-5.1 ± 1.3	-5.7 ± 0.5
Buff	PDov			-3.1 ± 2.7	-2.5 ± 1.9	-1.8 ± 1.1
Buff	PSta	-0.3 ± 1.5		-0.5 ± 0.9	-6.1 ± 3.3	-7.4 ± 0.5
Buff	StuP			-0.1 ± 1.6	1.5 ± 1.1	2.1 ± 1.6
Buff	Tole			-4.5 ± 1.0	-7.8 ± 5.7	-8.6 ± 0.4
Clev	Erie			-1.2 ± 1.5	-3.2 ± 3.0	-2.3 ± 1.2
Clev	Erio			-0.1 ± 2.2	0.0 ± 1.4	0.2 ± 1.1
Clev	Fair		-6.9 ± 3.6		-16.6 ± 1.4	-11.9 ± 2.2
Clev	Ferm				-2.4 ± 2.6	0.2 ± 1.3
Clev	Kngv				-0.5 ± 2.8	-0.5 ± 1.2
Clev	Marb		0.6 ± 1.3	0.8 ± 1.3	-0.3 ± 2.2	1.4 ± 1.2
Clev	Monr				-12.0 ± 2.9	-6.2 ± 5.9
Clev	PCol	-0.6 ± 1.2	0.3 ± 0.9		3.8 ± 4.0	4.1 ± 0.6
Clev	PDov				6.2 ± 2.1	6.8 ± 3.0
Clev	PSta	5.5 ± 1.5	4.9 ± 1.1	4.1 ± 0.5	5.8 ± 0.9	8.0 ± 1.1
Clev	StuP				10.2 ± 3.2	2.4 ± 2.2
Clev	Tole			2.1 ± 0.7	8.7 ± 3.5	2.4 ± 0.6
Erie	Erio				1.8 ± 0.7	1.2 ± 0.5
Erie	Fair				1.0 ± 2.9	2.5 ± 2.9
Erie	Ferm					2.5 ± 1.6
Erie	Kngv					-5.0 ± 2.2
Erie	Marb					-9.6 ± 2.5
Erie	Monr					4.8 ± 4.8
Erie	PCol					2.5 ± 1.8
Erie	PDov					2.6 ± 3.0
Erie	PSta			1.1 ± 2.1	3.7 ± 4.0	1.8 ± 1.7
Erie	StuP				2.5 ± 2.2	3.7 ± 1.7

TABLE DR3. COMPARISON OF RELATIVE VERTICAL VELOCITIES AND THEIR STANDARD DEVIATION IN CM/CENTURY  
BETWEEN GAUGES ON LAKE ERIE (CONTINUED...)

Gauge pair	Coordinating Com., 1977	Tait and Bolduc, 1985	Carrera et al, 1991	Tushingham, 1992	This Study Method 1	This Study Method 3
Erie	Tole			2.4 ± 2.4	1.8 ± 4.8	3.5 ± 1.3
Erie	Fair				-14.1 ± 1.4	-12.1 ± 2.5
Erie	Ferm				-1.7 ± 2.7	0.0 ± 1.7
Erie	Kngv			2.9 ± 4.0	-1.7 ± 2.0	-0.7 ± 1.6
Erie	Marb			-0.3 ± 1.9	-0.3 ± 2.4	1.2 ± 1.6
Erie	Monr				-4.3 ± 3.0	-6.4 ± 6.0
Erie	PCol				5.5 ± 3.7	3.9 ± 1.2
Erie	PDov			6.1 ± 4.4	7.3 ± 3.0	7.8 ± 1.6
Erie	PSta			5.5 ± 2.0	2.2 ± 2.1	2.2 ± 1.2
Erie	StuP			10.7 ± 4.2	10.3 ± 3.5	11.7 ± 1.9
Erie	Tole			-0.5 ± 2.6	-2.7 ± 3.1	1.0 ± 1.2
Fair	Ferm				14.1 ± 3.3	12.1 ± 2.6
Fair	Kngv				10.1 ± 2.6	11.4 ± 2.5
Fair	Marb				13.8 ± 3.0	13.3 ± 2.5
Fair	Monr				-8.0 ± 3.7	5.7 ± 6.3
Fair	PCol				15.8 ± 3.0	16.0 ± 2.3
Fair	PDov				19.9 ± 2.4	19.9 ± 2.5
Fair	PSta				12.9 ± 1.4	14.3 ± 2.3
Fair	StuP				22.3 ± 2.9	23.8 ± 2.7
Fair	Tole				13.0 ± 3.6	13.1 ± 2.2
Ferm	Kngv				-0.4 ± 1.4	-0.7 ± 1.8
Ferm	Marb				1.4 ± 1.3	1.2 ± 1.8
Ferm	Monr				-2.7 ± 1.1	-6.4 ± 6.0
Ferm	PCol				6.6 ± 5.2	3.9 ± 1.4
Ferm	PDov				7.6 ± 4.9	7.8 ± 1.7
Ferm	PSta				-0.8 ± 4.1	2.2 ± 1.4
Ferm	StuP				10.5 ± 5.2	11.7 ± 2.1
Ferm	Tole			1.6 ± 1.3	-1.4 ± 1.3	1.0 ± 1.4
Kngv	Marb			3.1 ± 2.3	1.6 ± 1.4	1.9 ± 1.7
Kngv	Monr				5.2 ± 1.7	-5.7 ± 6.0
Kngv	PCol				7.2 ± 4.6	4.6 ± 1.3
Kngv	PDov			8.8 ± 3.8	8.6 ± 4.1	8.5 ± 1.6
Kngv	PSta			-4.8 ± 3.6	-0.3 ± 3.4	2.9 ± 1.3
Kngv	StuP			11.0 ± 6.6	12.6 ± 4.5	12.4 ± 2.0
Kngv	Tole			4.7 ± 2.6	-0.7 ± 2.1	1.7 ± 1.3
Marb	Monr				-5.5 ± 1.5	-7.6 ± 6.0
Marb	PCol				4.6 ± 4.9	2.7 ± 1.3
Marb	PDov			5.4 ± 3.0	6.2 ± 4.5	6.6 ± 1.6
Marb	PSta			-1.0 ± 2.7	-1.3 ± 3.8	1.0 ± 1.3
Marb	StuP			7.4 ± 3.5	9.0 ± 4.9	10.5 ± 2.0
Marb	Tole			0.0 ± 1.1	-2.0 ± 1.8	-0.2 ± 1.3
Monr	PCol				7.2 ± 5.5	10.3 ± 5.9
Monr	PDov				11.0 ± 5.0	14.2 ± 6.0
Monr	PSta				6.8 ± 4.4	8.6 ± 5.9
Monr	StuP				24.1 ± 5.3	18.1 ± 6.1
Monr	Tole			6.6 ± 4.3	3.6 ± 1.4	7.4 ± 5.9
PCol	PDov	6.1 ±	4.6 ± 1.2	3.8 ± 0.6	-1.0 ± 2.9	-1.7 ± 0.7
PCol	PSta			4.6 ± 2.4	4.6 ± 0.9	7.8 ± 1.7
PCol	Tole				-2.3 ± 5.4	-2.9 ± 0.6
PDov	PSta			-7.0 ± 2.3	-5.7 ± 3.1	-8.1 ± 1.8
PDov	StuP				8.0 ± 3.5	4.6 ± 1.4
PDov	Tole				4.7 ± 3.7	-8.5 ± 4.9
PSta	StuP				11.4 ± 3.3	12.0 ± 2.3
PSta	Tole				-2.8 ± 1.3	-2.2 ± 4.0
StuP	Tole				-10.3 ± 4.5	-12.2 ± 5.5

TABLE DR4. COMPARISON OF RELATIVE VERTICAL VELOCITIES AND THEIR STANDARD DEVIATION IN CM/CENTURY  
BETWEEN GAUGES ON LAKE MICHIGAN-HURON.

Gauge pair	Coordinating Com., 1977	Tait and Bolduc, 1985	Carrera et al, 1991	Tushingham, 1992	This Study Method 1	This Study Method 3
Calu Coll	31.7 ± 2.1			29.1 ± 1.5	26.7 ± 3.9	27.0 ± 1.0
Calu DeTo3					27.0 ± 3.2	27.7 ± 1.1
Calu Esse3				10.5 ± 2.0	8.0 ± 2.1	9.1 ± 1.1
Calu Gode	10.4 ± 2.4			8.9 ± 1.0	8.5 ± 3.5	8.9 ± 1.0
Calu Gree3				5.0 ± 2.3	3.0 ± 2.1	4.2 ± 1.1
Calu Harb	12.5 ± 1.8			13.2 ± 1.1	11.7 ± 2.9	10.5 ± 1.0
Calu Harr				13.3 ± 3.2	16.1 ± 2.9	18.4 ± 1.3
Calu Holl				3.6 ± 1.6	3.2 ± 1.9	2.5 ± 1.1
Calu Kewa					-0.9 ± 1.8	1.9 ± 1.9
Calu Lake				11.0 ± 1.9	9.6 ± 2.6	10.4 ± 0.7
Calu Litt					34.3 ± 3.9	37.4 ± 1.2
Calu Ludi				-5.3 ± 1.8	-3.0 ± 2.4	-1.8 ± 1.1
Calu Mack	20.1 ± 2.1			22.1 ± 1.1	20.5 ± 3.3	20.4 ± 1.0
Calu Milw3	-4.9 ± 1.2		-4.5 ± 0.7	-2.4 ± 1.0	-5.1 ± 1.8	-4.0 ± 1.0
Calu Parr				29.2 ± 3.7	32.2 ± 4.0	34.7 ± 1.2
Calu Plnl				17.0 ± 3.9	16.7 ± 2.7	19.8 ± 1.3
Calu StuB	7.6 ± 1.8			10.5 ± 1.4	6.9 ± 2.3	6.6 ± 1.0
Calu Thes	31.4 ± 2.1			29.4 ± 1.3	31.1 ± 3.4	31.2 ± 1.0
Calu Tobe				15.3 ± 5.0	24.5 ± 3.8	27.1 ± 1.2
Coll DeTo3					3.0 ± 1.8	0.7 ± 1.1
Coll Esse3				-13.7 ± 2.1	-15.1 ± 3.1	-17.9 ± 1.1
Coll Gode	-20.4 ± 1.5	-20.6 ± 1.6	-18.9 ± 0.4	-18.7 ± 0.7	-18.2 ± 1.5	-18.1 ± 1.0
Coll Gree3				-17.1 ± 2.2	-20.2 ± 3.9	-22.8 ± 1.1
Coll Harb	-19.2 ± 0.6			-15.8 ± 0.4	-14.5 ± 1.6	-16.5 ± 1.0
Coll Harr				-4.2 ± 2.8	-6.0 ± 1.6	-8.6 ± 1.3
Coll Holl				-19.8 ± 3.0	-23.8 ± 3.2	-24.5 ± 1.1
Coll Kewa					-22.1 ± 3.5	-25.1 ± 1.9
Coll Lake				-11.7 ± 2.1	-14.0 ± 2.0	-16.6 ± 0.7
Coll Litt					14.9 ± 1.9	10.4 ± 1.2
Coll Ludi				-31.8 ± 2.0	-30.7 ± 3.0	-28.8 ± 1.1
Coll Mack	-11.3 ± 1.2			-7.2 ± 0.7	-5.9 ± 2.1	-6.6 ± 1.0
Coll Milw3	-36.3 ± 1.8			-31.4 ± 0.8	-32.4 ± 3.7	-31.0 ± 1.0
Coll Parr			12.0 ± 1.2	12.2 ± 1.9	11.0 ± 1.1	7.7 ± 1.2
Coll Plnl				-0.6 ± 3.6	-3.0 ± 2.7	-7.2 ± 1.3
Coll StuB	-24.1 ± 1.5			-19.1 ± 0.8	-20.8 ± 3.3	-20.4 ± 1.0
Coll Thes	0.0 ± 0.9		1.8 ± 0.6	1.7 ± 0.7	4.1 ± 1.7	4.2 ± 1.0
Coll Tobe			4.2 ± 1.8	4.3 ± 2.9	3.4 ± 1.3	0.1 ± 1.2
DeTo3 Esse3					-19.3 ± 2.7	-18.6 ± 1.2
DeTo3 Gode					-21.0 ± 1.9	-18.8 ± 1.1
DeTo3 Gree3					-24.3 ± 3.1	-23.5 ± 1.2
DeTo3 Harb					-15.3 ± 1.6	-17.2 ± 1.1
DeTo3 Harr					-9.9 ± 1.3	-9.3 ± 1.4
DeTo3 Holl					-26.2 ± 2.4	-25.2 ± 1.1
DeTo3 Kewa					-27.6 ± 2.6	-25.8 ± 2.0
DeTo3 Lake					-17.9 ± 2.0	-17.3 ± 0.8
DeTo3 Litt					9.9 ± 1.7	9.7 ± 1.3
DeTo3 Ludi					-34.2 ± 2.1	-29.5 ± 1.1
DeTo3 Mack					-6.1 ± 1.1	-7.3 ± 1.1
DeTo3 Milw3					-31.8 ± 2.9	-31.7 ± 1.1
DeTo3 Parr					6.5 ± 1.7	7.0 ± 1.3
DeTo3 Plnl					-9.0 ± 1.5	-7.9 ± 1.4
DeTo3 StuB					-22.4 ± 2.4	-21.1 ± 1.1
DeTo3 Thes		3.2 ± 0.8			2.7 ± 1.1	3.5 ± 1.1
DeTo3 Tobe					-1.4 ± 1.5	-0.6 ± 1.3
Esse3 Gode				-3.3 ± 2.9	-1.6 ± 2.9	-0.2 ± 1.1
Esse3 Gree3				-4.9 ± 1.4	-5.0 ± 2.2	-4.9 ± 1.3
Esse3 Harb		1.7 ± 1.9		3.7 ± 1.3	4.5 ± 2.2	1.4 ± 1.1
Esse3 Harr				8.4 ± 2.3	10.8 ± 2.4	9.3 ± 1.4
Esse3 Holl				-7.8 ± 1.9	-6.2 ± 2.1	-6.6 ± 1.2
Esse3 Kewa					-6.3 ± 2.1	-7.2 ± 2.0
Esse3 Lake				1.1 ± 1.4	1.4 ± 1.9	1.3 ± 0.9
Esse3 Litt					30.5 ± 3.3	28.3 ± 1.3
Esse3 Ludi				-16.5 ± 1.7	-14.8 ± 2.4	-10.9 ± 1.2
Esse3 Mack				12.7 ± 1.8	14.4 ± 2.7	11.3 ± 1.1
Esse3 Milw3				-15.3 ± 1.8	-13.5 ± 2.2	-13.1 ± 1.1
Esse3 Parr				25.8 ± 3.4	27.3 ± 3.4	25.6 ± 1.3
Esse3 Plnl				10.7 ± 3.1	12.5 ± 2.5	10.7 ± 1.4
Esse3 StuB				-4.7 ± 1.6	-3.4 ± 2.0	-2.5 ± 1.1
Esse3 Thes				16.7 ± 2.4	22.6 ± 2.9	22.1 ± 1.1
Esse3 Tobe				16.4 ± 4.0	20.3 ± 3.2	18.0 ± 1.3

TABLE DR4. COMPARISON OF RELATIVE VERTICAL VELOCITIES AND THEIR STANDARD DEVIATION IN CM/CENTURY  
BETWEEN GAUGES ON LAKE MICHIGAN-HURON (CONTINUED...).

Gauge pair		Coordinating Com., 1977	Tait and Bolduc, 1985	Carrera et al, 1991	Tushingham, 1992	This Study Method 1	This Study Method 3
Godde	Gree3				-0.8 ± 3.5	-3.4 ± 3.8	-4.7 ± 1.1
Godde	Harb	1.5 ± 1.2	3.7 ± 1.4	2.3 ± 0.4	2.3 ± 0.6	3.7 ± 1.4	1.6 ± 1.0
Godde	Harr				8.6 ± 4.9	9.8 ± 1.6	9.5 ± 1.3
Godde	Holl				-4.9 ± 3.8	-5.9 ± 2.9	-6.4 ± 1.1
Godde	Kewa					-3.4 ± 3.2	-7.0 ± 1.9
Godde	Lake			2.8 ± 1.6	3.8 ± 2.7	2.3 ± 1.9	1.5 ± 0.7
Godde	Litt					30.5 ± 2.3	28.5 ± 1.2
Godde	Ludi				-14.6 ± 2.4	-13.4 ± 2.9	-10.7 ± 1.1
Godde	Mack	9.4 ± 1.5	11.7 ± 1.5		11.6 ± 0.7	12.4 ± 2.2	11.5 ± 1.0
Godde	Milw3	-14.9 ± 1.8	-13.1 ± 1.6		-12.7 ± 0.9	-14.3 ± 3.3	-12.9 ± 1.0
Godde	Parr				26.8 ± 3.6	27.0 ± 1.9	25.8 ± 1.2
Godde	Plnl				8.7 ± 5.8	11.9 ± 2.7	10.9 ± 1.3
Godde	StuB	-3.0 ± 1.5			-1.4 ± 0.8	-2.6 ± 3.1	-2.3 ± 1.0
Godde	Thes	20.7 ± 1.2	21.5 ± 1.6		20.8 ± 0.9	22.4 ± 1.9	22.3 ± 1.0
Godde	Tobe				16.9 ± 5.8	19.0 ± 1.9	18.2 ± 1.2
Gree3	Harb				8.1 ± 1.4	9.7 ± 3.1	6.3 ± 1.1
Gree3	Harr				13.1 ± 2.2	15.5 ± 3.1	14.2 ± 1.4
Gree3	Holl				-3.5 ± 1.5	-1.7 ± 2.0	-1.7 ± 1.2
Gree3	Kewa					1.3 ± 1.7	-2.3 ± 2.0
Gree3	Lake				6.1 ± 1.7	6.8 ± 2.9	6.2 ± 0.9
Gree3	Litt					33.6 ± 3.8	33.2 ± 1.3
Gree3	Ludi				-11.5 ± 1.3	-10.0 ± 2.1	-6.0 ± 1.2
Gree3	Mack				18.0 ± 2.1	19.4 ± 3.0	16.2 ± 1.1
Gree3	Milw3				-11.0 ± 1.7	-8.7 ± 1.8	-8.2 ± 1.1
Gree3	Parr				29.1 ± 2.7	31.7 ± 4.1	30.5 ± 1.3
Gree3	Plnl				14.3 ± 2.8	16.0 ± 2.4	15.6 ± 1.4
Gree3	StuB			-1.7 ± 1.7	0.0 ± 1.6	1.3 ± 1.6	2.4 ± 1.1
Gree3	Thes				21.5 ± 2.4	27.5 ± 3.2	27.0 ± 1.1
Gree3	Tobe				17.9 ± 3.2	23.7 ± 3.8	22.9 ± 1.3
Harb	Harr			4.7 ± 1.2	4.9 ± 1.2	5.2 ± 0.9	7.9 ± 1.3
Harb	Holl				-11.9 ± 1.5	-8.7 ± 2.3	-8.0 ± 1.1
Harb	Kewa					-11.0 ± 2.6	-8.6 ± 1.9
Harb	Lake				-2.5 ± 1.1	-3.2 ± 0.9	-0.1 ± 0.7
Harb	Litt					24.8 ± 2.0	26.9 ± 1.2
Harb	Ludi				-20.2 ± 1.1	-13.6 ± 2.6	-12.3 ± 1.1
Harb	Mack	7.6 ± 1.2			9.1 ± 0.4	8.9 ± 1.8	9.9 ± 1.0
Harb	Milw3	-17.1 ± 1.5			-13.7 ± 0.4	-14.5 ± 2.9	-14.5 ± 1.0
Harb	Parr				21.7 ± 1.8	21.9 ± 1.8	24.2 ± 1.2
Harb	Plnl				7.1 ± 2.3	6.8 ± 2.1	9.3 ± 1.3
Harb	StuB	-5.2 ± 1.2			-3.3 ± 0.6	-5.3 ± 2.5	-3.9 ± 1.0
Harb	Thes	19.2 ± 1.2			17.5 ± 0.6	18.7 ± 1.6	20.7 ± 1.0
Harb	Tobe				11.2 ± 2.6	14.2 ± 1.6	16.6 ± 1.2
Harr	Holl				-16.1 ± 2.1	-17.0 ± 2.3	-15.9 ± 1.4
Harr	Kewa					-15.9 ± 2.6	-16.5 ± 2.1
Harr	Lake				-6.8 ± 2.3	-8.1 ± 1.4	-8.0 ± 1.1
Harr	Litt					17.7 ± 1.7	19.0 ± 1.5
Harr	Ludi				-21.0 ± 2.1	-23.2 ± 2.2	-20.2 ± 1.4
Harr	Mack				6.9 ± 2.2	5.9 ± 1.5	2.0 ± 1.3
Harr	Milw3				-19.2 ± 2.8	-21.7 ± 2.8	-22.4 ± 1.3
Harr	Parr				17.5 ± 2.3	17.6 ± 1.7	16.3 ± 1.5
Harr	Plnl				2.6 ± 2.6	1.4 ± 1.9	1.4 ± 1.6
Harr	StuB			-10.0 ± 2.1	-11.9 ± 2.4	-11.8 ± 1.3	
Harr	Thes				11.3 ± 3.4	13.6 ± 1.5	12.8 ± 1.3
Harr	Tobe				6.6 ± 2.9	8.8 ± 1.6	8.7 ± 1.5
Holl	Kewa					-0.4 ± 1.4	-0.6 ± 2.0
Holl	Lake				10.3 ± 1.7	8.1 ± 2.3	7.9 ± 0.8
Holl	Litt					35.5 ± 3.2	34.9 ± 1.3
Holl	Ludi				-5.5 ± 1.4	-3.2 ± 1.5	-4.3 ± 1.1
Holl	Mack				24.7 ± 2.4	18.1 ± 2.4	17.9 ± 1.1
Holl	Milw3			-14.7 ± 1.3	-2.8 ± 1.4	-7.3 ± 1.6	-6.5 ± 1.1
Holl	Parr				32.8 ± 2.8	33.1 ± 3.4	32.2 ± 1.3
Holl	Plnl				19.1 ± 2.6	18.2 ± 1.9	17.3 ± 1.4
Holl	StuB				5.8 ± 1.4	4.2 ± 1.4	4.1 ± 1.1
Holl	Thes				26.5 ± 2.9	30.2 ± 2.5	28.7 ± 1.1
Holl	Tobe				21.3 ± 3.7	25.5 ± 3.0	24.6 ± 1.3

TABLE DR4. COMPARISON OF RELATIVE VERTICAL VELOCITIES AND THEIR STANDARD DEVIATION IN CM/CENTURY  
BETWEEN GAUGES ON LAKE MICHIGAN-HURON (CONTINUED).

Gauge pair		Coordinating Com., 1977	Tait and Bolduc, 1985	Carrera et al, 1991	Tushingham, 1992	This Study Method 1	This Study Method 3
Kewa	Lake					6.9 ± 2.5	8.5 ± 1.8
Kewa	Litt					31.0 ± 3.4	35.5 ± 2.1
Kewa	Ludi					-5.2 ± 1.5	-3.7 ± 2.0
Kewa	Mack					20.1 ± 2.4	18.5 ± 1.9
Kewa	Milw3					-8.1 ± 1.3	-5.9 ± 1.9
Kewa	Parr					31.7 ± 3.7	32.8 ± 2.1
Kewa	Plnl					17.0 ± 1.9	17.9 ± 2.1
Kewa	StuB		14.5 ± 3.3			4.9 ± 1.0	4.7 ± 1.9
Kewa	Thes					34.1 ± 2.8	29.3 ± 1.9
Kewa	Tobe					32.0 ± 3.5	25.2 ± 2.1
Lake	Litt					28.2 ± 2.5	27.0 ± 1.0
Lake	Ludi				-17.1 ± 1.9	-16.2 ± 2.4	-12.2 ± 0.8
Lake	Mack				12.9 ± 2.0	13.9 ± 2.2	10.0 ± 0.7
Lake	Milw3				-16.2 ± 1.8	-14.9 ± 2.5	-14.4 ± 0.7
Lake	Parr				22.8 ± 2.5	24.9 ± 2.3	24.3 ± 1.0
Lake	Plnl				9.9 ± 3.1	10.6 ± 2.3	9.4 ± 1.1
Lake	StuB				-5.7 ± 1.6	-5.0 ± 2.4	-3.8 ± 0.7
Lake	Thes				16.4 ± 2.8	21.5 ± 2.2	20.8 ± 0.7
Lake	Tobe				11.7 ± 3.9	16.5 ± 2.2	16.7 ± 1.0
Litt	Ludi					-41.6 ± 3.0	-39.2 ± 1.3
Litt	Mack					-13.3 ± 1.8	-17.0 ± 1.2
Litt	Milw3					-39.3 ± 3.7	-41.4 ± 1.2
Litt	Parr					-3.2 ± 1.6	-2.7 ± 1.4
Litt	Plnl					-14.4 ± 2.3	-17.6 ± 1.5
Litt	StuB					-30.5 ± 3.3	-30.8 ± 1.2
Litt	Thes		-20.4 ± 2.4			-4.4 ± 1.7	-6.2 ± 1.2
Litt	Tobe					-8.2 ± 1.5	-10.3 ± 1.4
Ludi	Mack				29.1 ± 1.4	23.7 ± 2.3	22.2 ± 1.1
Ludi	Milw3		-2.6 ± 1.5		0.9 ± 1.5	-3.6 ± 2.1	-2.2 ± 1.1
Ludi	Parr				38.7 ± 2.3	39.2 ± 3.2	36.5 ± 1.3
Ludi	Plnl				22.0 ± 1.6	23.0 ± 1.4	21.6 ± 1.4
Ludi	StuB			11.6 ± 0.7	11.5 ± 0.9	10.3 ± 1.4	8.4 ± 1.1
Ludi	Thes				34.2 ± 1.5	37.1 ± 2.2	33.0 ± 1.1
Ludi	Tobe				28.4 ± 2.9	31.1 ± 2.9	28.9 ± 1.3
Mack	Milw3	-24.7 ± 1.5			-24.2 ± 0.6	-25.3 ± 2.9	-24.4 ± 1.0
Mack	Parr				8.2 ± 2.7	10.0 ± 2.0	14.3 ± 1.2
Mack	Plnl				-6.8 ± 1.8	-4.3 ± 1.4	-0.6 ± 1.3
Mack	StuB	-12.8 ± 1.2		-13.9 ± 0.6	-12.0 ± 0.6	-14.0 ± 2.5	-13.8 ± 1.0
Mack	Thes	11.6 ± 1.2		9.2 ± 0.5	9.4 ± 0.8	10.1 ± 1.3	10.8 ± 1.0
Mack	Tobe				2.6 ± 3.6	3.1 ± 1.8	6.7 ± 1.2
Milw3	Parr				35.3 ± 3.6	37.2 ± 3.9	38.7 ± 1.2
Milw3	Plnl				23.2 ± 3.4	22.9 ± 2.2	23.8 ± 1.3
Milw3	StuB	12.2 ± 1.2			12.5 ± 0.5	11.8 ± 1.7	10.6 ± 1.0
Milw3	Thes	36.0 ± 1.5			34.5 ± 1.1	36.8 ± 3.0	35.2 ± 1.0
Milw3	Tobe				22.8 ± 4.6	30.2 ± 3.6	31.1 ± 1.2
Parr	Plnl				-15.1 ± 2.7	-14.3 ± 2.6	-14.9 ± 1.5
Parr	StuB				-27.2 ± 2.5	-28.0 ± 3.5	-28.1 ± 1.2
Parr	Thes				-4.2 ± 2.2	-2.4 ± 1.7	-3.5 ± 1.2
Parr	Tobe				-10.1 ± 3.2	-8.5 ± 1.3	-7.6 ± 1.4
Plnl	StuB				-14.9 ± 1.8	-13.1 ± 1.6	-13.2 ± 1.3
Plnl	Thes				10.2 ± 2.9	13.2 ± 1.7	11.4 ± 1.3
Plnl	Tobe				9.0 ± 3.7	7.8 ± 2.4	7.3 ± 1.5
StuB	Thes	24.4 ± 1.2			23.7 ± 0.8	25.0 ± 2.6	24.6 ± 1.0
StuB	Tobe				16.2 ± 3.9	20.1 ± 3.2	20.5 ± 1.2
Thes	Tobe				-2.6 ± 2.9	-5.5 ± 1.4	-4.1 ± 1.2

TABLE DR5. COMPARISON OF RELATIVE VERTICAL VELOCITIES AND THEIR STANDARD DEVIATION IN CM/CENTURY  
BETWEEN GAUGES ON LAKE SUPERIOR.

Gauge pair	Coordinating Com., 1977	Tait and Bolduc, 1985	Carrera et al, 1991	Tushingham, 1992	This Study Method 1	This Study Method 3
Dulu Gran				22.3 ± 1.2	19.4 ± 1.2	17.7 ± 0.9
Dulu Gros				29.5 ± 4.1	28.6 ± 2.5	26.9 ± 0.8
Dulu Marq3	11.3 ± 0.9			11.7 ± 0.4	13.1 ± 2.5	13.1 ± 0.4
Dulu Mich	52.1 ± 1.5	50.9 ± 1.0		47.1 ± 0.9	50.2 ± 2.5	48.6 ± 0.4
Dulu Onto				8.0 ± 1.9	8.5 ± 1.8	6.6 ± 0.8
Dulu Poin	23.5 ± 1.2			25.8 ± 0.8	26.9 ± 2.6	25.3 ± 0.3
Dulu Ross					55.1 ± 2.2	52.8 ± 0.9
Dulu Thun	29.0 ± 1.2	29.9 ± 0.9	30.8 ± 0.4	29.9 ± 0.6	29.4 ± 1.5	27.7 ± 0.4
Dulu TwoH			5.9 ± 0.5		4.9 ± 0.9	4.1 ± 0.6
Gran Gros				9.5 ± 14	7.2 ± 1.8	9.2 ± 1.1
Gran Marq3				-2.7 ± 1.8	-0.7 ± 1.3	-4.6 ± 0.9
Gran Mich				22.5 ± 2.8	29.6 ± 1.8	30.9 ± 0.9
Gran Onto				-15.0 ± 2.5	-12.1 ± 1.3	-11.1 ± 1.1
Gran Poin				9.6 ± 2.0	9.0 ± 1.8	7.6 ± 0.8
Gran Ross					35.0 ± 1.8	35.1 ± 1.1
Gran Thun		15.3 ± 2.2		15.3 ± 3.5	10.0 ± 1.2	10.0 ± 0.9
Gran TwoH					-11.9 ± 0.8	-13.6 ± 0.9
Gros Marq3				-14.4 ± 4.0	-10.7 ± 1.4	-13.8 ± 0.8
Gros Mich				17.1 ± 4.2	18.9 ± 1.4	21.7 ± 0.8
Gros Onto				-20.5 ± 11.0	-20.7 ± 2.0	-20.3 ± 1.0
Gros Poin		3.4 ± 4.0		3.4 ± 9.7	-0.2 ± 1.2	-1.6 ± 0.7
Gros Ross					27.2 ± 2.0	25.9 ± 1.1
Gros Thun				0.6 ± 5.1	0.2 ± 2.1	0.8 ± 0.8
Gros TwoH					-21.4 ± 2.3	-22.8 ± 0.9
Marq3 Mich	40.8 ± 0.9	39.4 ± 0.8	35.4 ± 0.5	33.7 ± 0.8	33.9 ± 1.3	35.5 ± 0.4
Marq3 Onto			-7.5 ± 2.1	-12.4 ± 1.8	-9.4 ± 1.5	-6.5 ± 0.8
Marq3 Poin	12.2 ± 0.6			11.1 ± 0.5	10.6 ± 1.1	12.2 ± 0.3
Marq3 Ross					35.7 ± 1.9	39.7 ± 0.9
Marq3 Thun	17.7 ± 1.2	17.5 ± 1.1	18.7 ± 0.5	16.9 ± 0.6	13.0 ± 1.8	14.6 ± 0.4
Marq3 TwoH					-9.0 ± 1.8	-9.0 ± 0.6
Mich Onto				-36.7 ± 2.7	-39.1 ± 1.7	-42.0 ± 0.8
Mich Poin	-29.0 ± 0.9		-25.4 ± 0.5	-25.3 ± 0.8	-23.3 ± 1.3	-23.3 ± 0.3
Mich Ross					5.7 ± 2.0	4.2 ± 0.9
Mich Thun	-23.2 ± 1.5	-21.0 ± 1.2		-17.3 ± 1.0	-20.9 ± 2.0	-20.9 ± 0.4
Mich TwoH					-45.0 ± 2.3	-44.5 ± 0.6
Onto Poin	23.5 ± 1.2			20.5 ± 2.0	19.2 ± 1.8	18.7 ± 0.7
Onto Ross					46.3 ± 2.0	46.2 ± 1.1
Onto Thun				26.8 ± 2.5	21.1 ± 1.5	21.1 ± 0.8
Onto TwoH					1.2 ± 1.7	-2.5 ± 0.9
Poin Ross					25.8 ± 2.1	27.5 ± 0.8
Poin Thun	5.8 ± 1.2			5.8 ± 0.9	2.5 ± 2.2	2.4 ± 0.3
Poin TwoH					-20.5 ± 2.3	-21.2 ± 0.5
Ross Thun			-27.4 ± 3.2		-24.9 ± 1.7	-25.1 ± 0.9
Ross TwoH					-57.7 ± 2.2	-48.7 ± 0.9
Thun TwoH					-23.8 ± 1.4	-23.6 ± 0.6

**TABLE DR6 - COUNT OF OUTLIERS (MONTHLY LAKE LEVEL AVERAGES REJECTED DURING THIS STUDY) PER MONTH AND PER SITE FOR EACH LAKE**

Gauge	Jan	Fev	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	# of meas.	% of outliers
<i>Lake Ontario</i>															
Burl	2	0	0	1	0	2	0	0	0	1	3	1	10	349	3%
Cape	7	7	6	4	1	0	3	4	1	3	2	9	47	997	5%
Cobo	2	1	3	1	1	0	1	0	1	1	1	1	13	531	2%
Kngs	3	1	2	2	2	0	0	0	1	1	2	2	16	1019	2%
Olco	0	0	1	0	0	0	0	0	0	0	0	0	1	377	0%
Oswe	9	8	11	13	4	2	4	2	2	5	8	9	77	1692	5%
PWel	0	1	0	1	0	0	3	1	0	3	1	11	567	2%	
Roch	4	7	9	12	3	2	4	2	2	5	8	8	66	1143	6%
Toro	7	3	3	4	0	0	0	2	3	2	2	2	28	1018	3%
Total	34	28	35	38	12	6	12	13	11	18	29	33	269		
<i>Lake Erie</i>															
Barc	6	1	0	0	0	0	0	0	1	0	3	5	16	306	5%
BarP	0	0	0	0	0	0	0	0	0	2	4	5	11	411	3%
Buff	23	2	3	1	0	0	0	0	0	5	33	37	104	1434	7%
Clev	5	2	0	0	0	0	0	0	0	0	10	9	26	1692	2%
Erie	5	1	0	0	0	0	0	0	0	0	4	8	18	475	4%
Erio	0	0	0	0	0	0	0	0	0	0	0	1	1	510	0%
Fair	0	0	0	0	0	0	0	0	0	0	0	0	0	304	0%
Ferm	4	2	0	1	0	0	0	0	0	1	6	6	20	447	4%
Kngv	0	0	0	0	0	0	0	0	0	0	2	5	7	456	2%
Marb	5	0	0	1	0	0	0	0	0	1	4	8	19	465	4%
Monr	0	0	0	0	0	0	0	0	0	2	2	3	7	157	4%
PCol	16	0	0	0	0	0	0	0	0	1	15	19	51	900	6%
PDov	7	1	0	2	1	1	0	0	0	0	3	9	24	490	5%
PSta	1	0	0	0	0	0	0	0	0	0	1	0	2	884	0%
StuP	13	0	0	0	0	0	0	0	0	1	11	14	39	383	10%
Tole	25	15	12	8	2	0	0	1	3	11	50	44	171	1085	16%
Total	110	24	15	13	3	1	0	1	4	24	148	173	516		
<i>Lake Michigan-Huron</i>															
Calu	8	8	11	9	2	1	1	1	5	2	10	12	70	1160	6%
Coll	1	0	1	0	0	0	0	0	2	1	7	2	14	886	2%
DeTo3	0	0	0	0	0	0	0	0	1	0	0	0	1	686	0%
Esse3	3	2	6	6	1	0	0	0	0	1	10	5	34	587	6%
Gode	0	3	0	1	1	1	1	0	0	0	2	4	13	884	1%
Gree3	3	2	6	8	6	1	0	0	1	3	12	10	52	588	9%
Harb	1	1	1	3	0	0	0	0	0	0	1	2	9	1692	1%
Harr	0	0	0	1	0	0	0	0	0	0	0	0	1	416	0%
Holl	1	0	1	1	0	1	0	0	0	0	0	0	4	528	1%
Kew	1	0	1	1	0	0	0	0	0	0	2	0	5	286	2%
Lake	0	0	0	0	0	1	1	0	1	0	1	0	4	507	1%
Litt	3	0	1	0	0	1	4	4	3	3	3	3	25	497	5%
Ludi	1	0	0	1	0	2	0	0	0	0	0	2	6	669	1%
Mack	0	2	2	0	0	0	0	0	0	0	2	0	6	1213	0%
Milw3	4	5	6	5	0	0	0	0	1	0	4	7	32	1687	2%
Parr	1	1	2	1	1	0	0	0	0	2	4	1	13	485	3%
PInl	0	1	0	0	0	0	0	0	0	0	1	2	2	431	0%
StuB	6	4	3	4	2	4	1	1	1	0	1	5	32	1016	3%
Thes	1	0	1	0	0	0	0	0	0	0	4	0	6	866	1%
Tobe	2	0	0	0	0	0	0	0	0	0	0	2	2	458	0%
Total	36	29	42	41	13	12	8	6	15	12	63	54	331		
<i>Lake Superior</i>															
Dulu	10	7	1	1	6	3	1	0	2	3	4	3	41	1571	3%
Gran	0	0	1	0	0	0	0	0	0	0	0	0	1	398	0%
Gros	7	1	0	2	2	2	2	2	3	0	2	4	27	454	6%
Marq3	6	2	1	1	5	3	1	0	1	2	3	1	26	1701	2%
Mich	2	0	0	0	1	1	1	0	0	1	2	3	11	834	1%
Onto	2	2	3	4	1	0	1	0	0	0	0	1	14	450	3%
Poin	8	1	0	0	0	0	0	0	0	1	2	1	13	768	2%
Ross	2	0	2	1	0	0	1	0	0	0	0	0	6	383	2%
Thun	0	0	1	0	0	0	0	0	0	0	0	0	1	839	0%
TwoH	1	2	0	0	1	0	1	0	0	1	0	1	7	581	1%
Total	38	15	9	9	16	9	8	2	6	8	13	14	147		