

RSP12

2011 Historical Market Data: Locational Marginal Prices Interface MW Flows

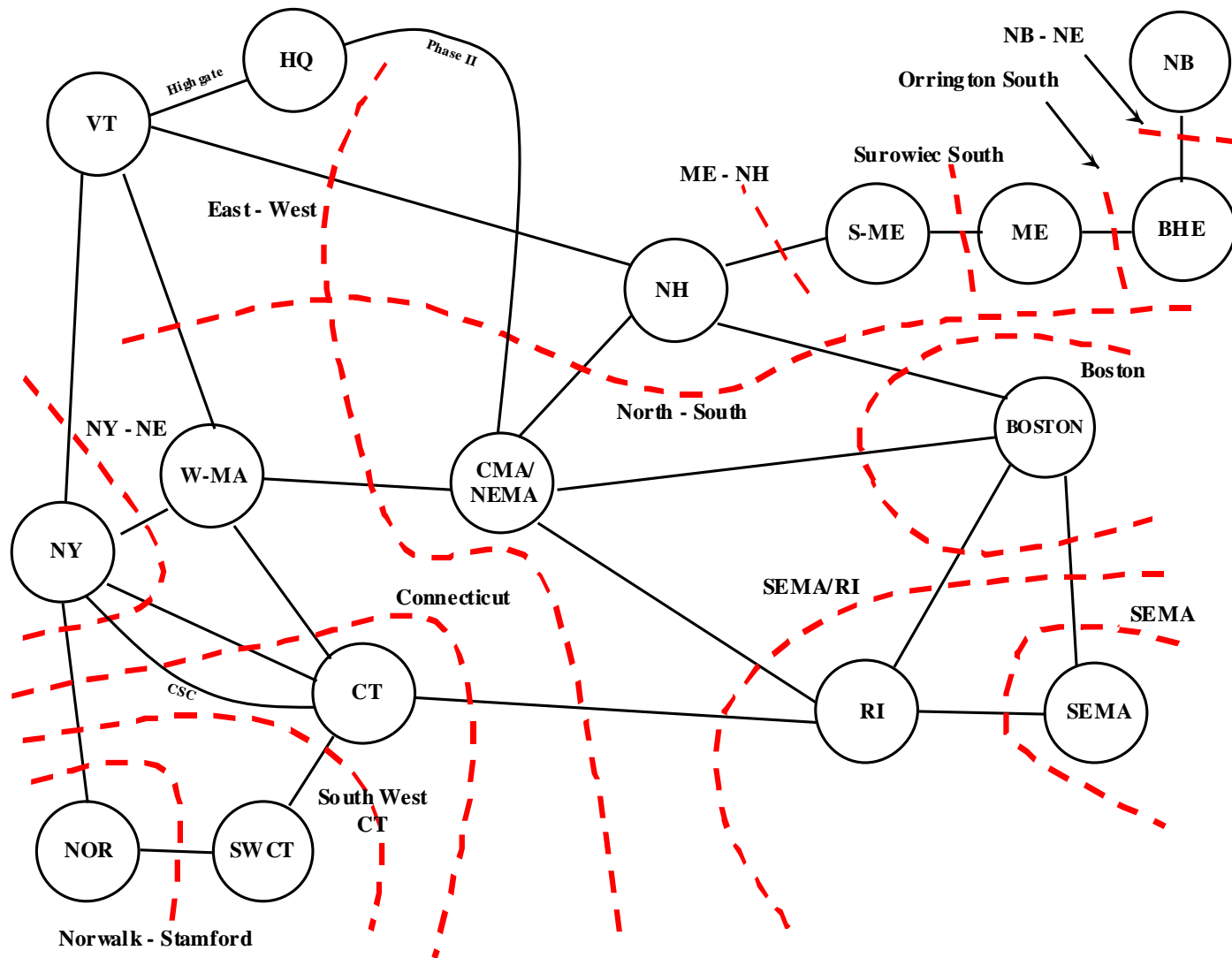
PAC Meeting
January 18, 2012

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Supervisor, Load Forecasting

Overview

- Average Real-time Locational Marginal Prices by subarea
 - Hourly Dollar per MWh
 - May have rounding and precision differences with Market Reports
- Internal Interfaces: Monthly Box Plots & Flow Duration Curves
 - Percentage of Limit
 - Percentages close to the limit may result from interface flows below the maximum due to conditions that reduce the transfer limit
- Market Information is summarized in other ISO-NE publications, such as the Annual Market Report http://www.iso-ne.com/markets/mkt_anlys_rpts/index.html
- Presentation is meant to show general trends of real time data.
 - anomalies within a trend are usually due to short-term events (for example, a generator or line outage)
- Real time data is subject to errors, missing data

New England Subarea Model



Box Plots & Duration Curves for Selected Interfaces

- East - West
- Maine – New Hampshire
- Boston Import
- SEMA/RI Export
- Connecticut Import
- Southwest CT Import
- Norwalk – Stamford
- North – South
- Orrington South
- Surowiec South
- East to West CT
- HQ Phase II
- New Brunswick
- New England-New York Cross Sound Cable
- New England-New York Northport
- New England-New York Rest of AC Ties

- HQ Phase II, New Brunswick, and New York Ties Metered Hourly Net Flows can be found on ISO-NE Website

http://www.iso-ne.com/markets/hstdata/dtld_net_intrchnng/ext_intfrc/index.html

- Limits for internal interfaces are calculated in real time by Internal Limit Calculator and are dynamic

- 2010 Flows and limits for internal interfaces now posted on ISO-NE Website, 2011 will be posted soon.

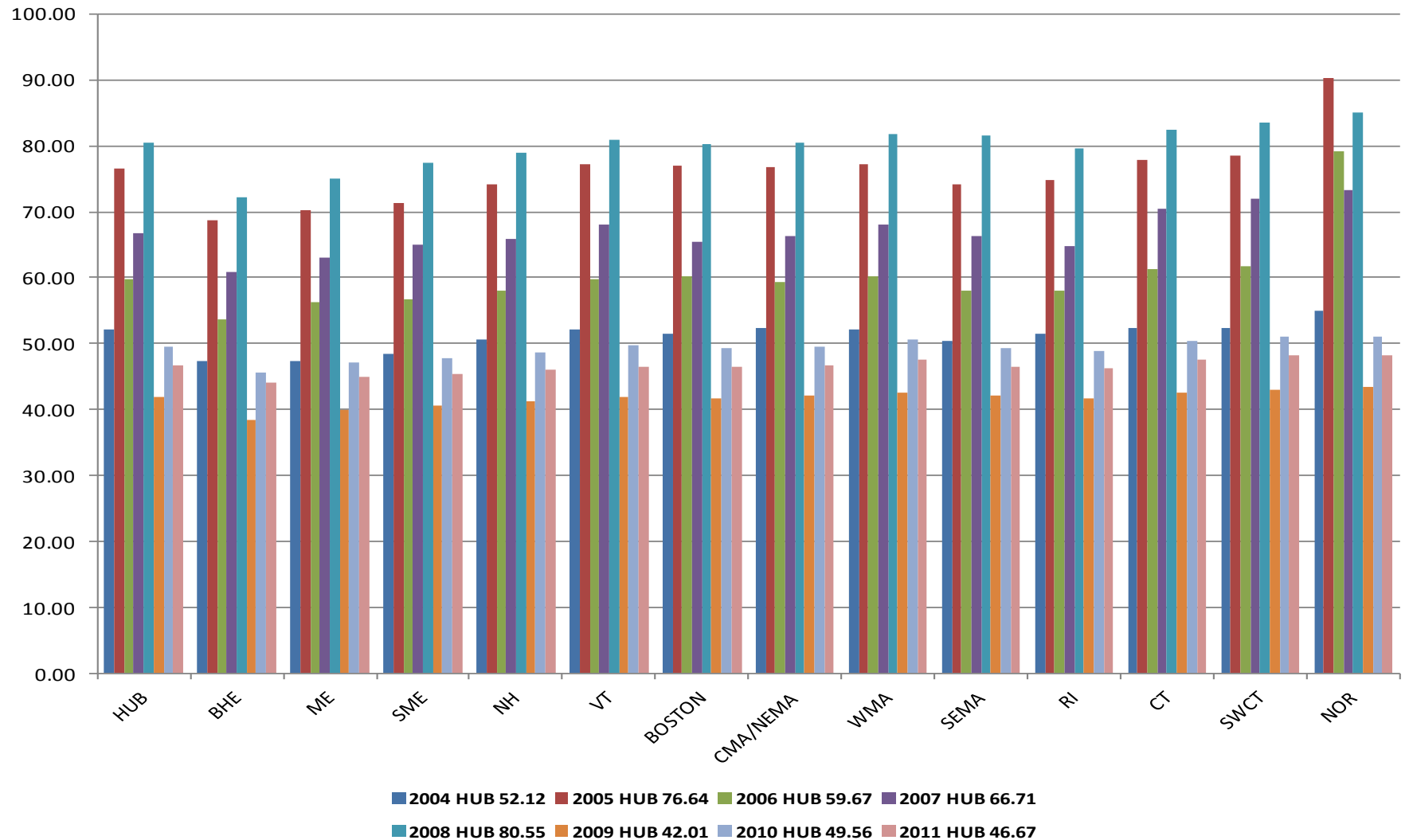
- http://www.iso-ne.com/markets/hstdata/hourly/hst_hrly_flows_and_lmts/index.html

Real-time Locational Marginal Price Summary					
RSP Sub-areas and HUB Jan-Dec 2011					
					Mean:
					Difference
	Mean	Std Dev	Maximum	Minimum	from HUB
HUB	46.67	25.37	558.55	0.00	0.00
BHE	44.18	24.43	493.14	0.00	-2.50
ME	44.89	24.27	504.07	0.00	-1.78
SME	45.41	24.49	521.08	0.00	-1.26
NH	46.04	24.96	548.54	0.00	-0.63
VT	46.49	25.20	552.84	0.00	-0.18
BOSTON	46.56	25.35	560.23	0.00	-0.11
CMA/NEMA	46.79	25.52	565.22	0.00	0.12
WMA	47.57	26.56	557.69	0.00	0.89
SEMA	46.49	25.42	565.43	0.00	-0.18
RI	46.35	25.18	559.62	0.00	-0.32
CT	47.68	26.65	567.39	0.00	1.01
SWCT	48.17	27.15	570.90	0.00	1.50
NOR	48.29	27.22	571.12	0.00	1.62

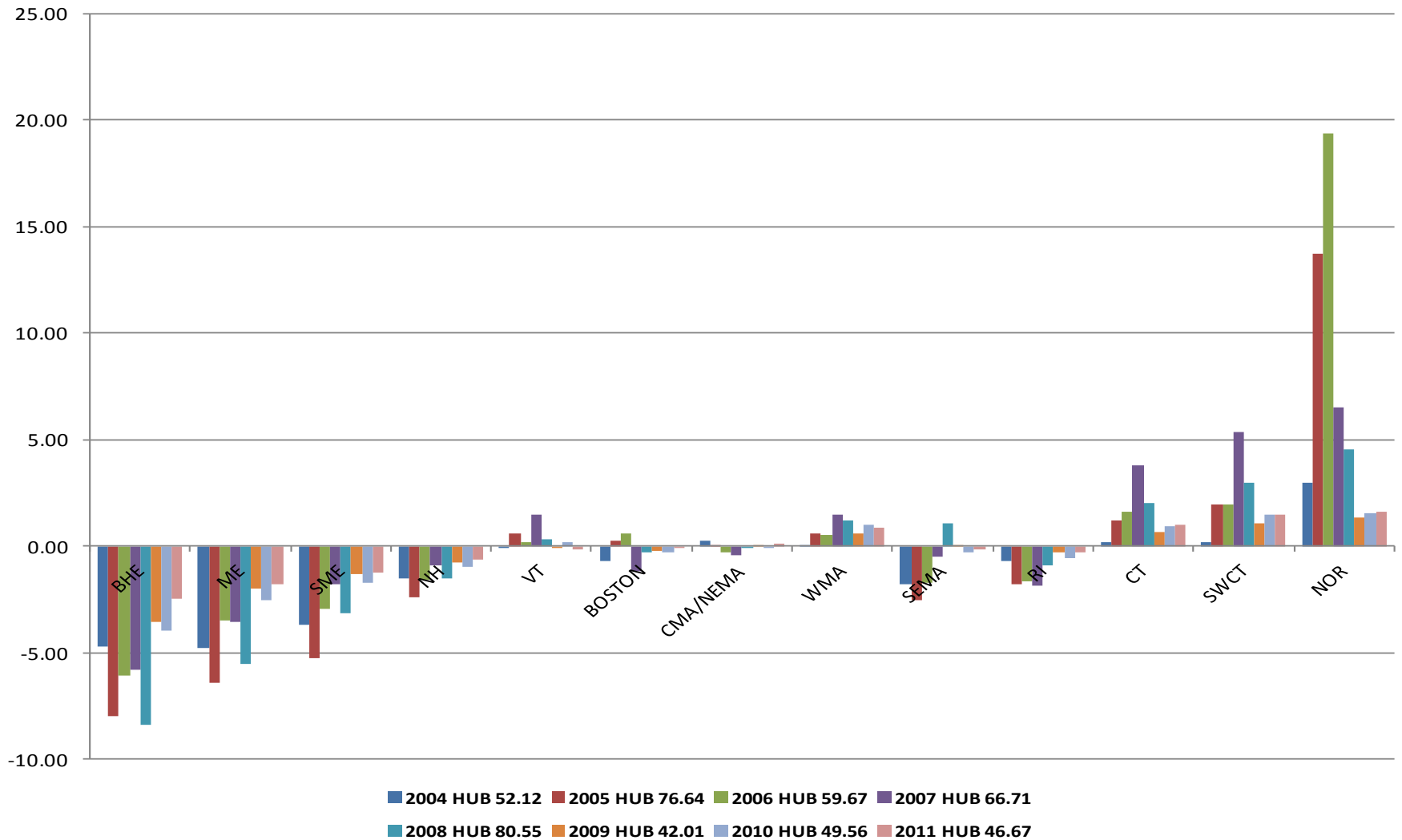
Congestion Component of Real-time Locational Marginal Price Summary RSP Sub-areas and HUB Jan-Dec 2011					
					Mean:
					Difference
	Mean	Std Dev	Maximum	Minimum	from HUB
HUB	-0.17	2.11	33.99	-72.45	0.00
BHE	-0.51	3.21	29.75	-81.99	-0.34
ME	-0.43	2.91	37.65	-79.77	-0.26
SME	-0.41	2.68	29.75	-59.99	-0.24
NH	-0.28	2.36	29.75	-59.99	-0.11
VT	-0.25	2.24	29.82	-60.33	-0.08
BOSTON	-0.08	2.16	47.85	-59.99	0.09
CMA/NEMA	-0.16	1.89	28.44	-59.99	0.01
WMA	0.34	5.24	258.35	-47.91	0.51
SEMA	-0.17	2.03	28.10	-59.99	0.00
RI	-0.17	1.82	26.06	-59.79	0.00
CT	0.33	3.72	107.27	-21.61	0.50
SWCT	0.46	5.14	182.36	-19.31	0.63
NOR	0.47	5.18	182.64	-18.84	0.64

Marginal Loss Component of					
Real-time Locational Marginal Price Summary					
RSP Sub-areas and HUB Jan-Dec 2011					
					Mean:
					Difference
	Mean	Std Dev	Maximum	Minimum	from HUB
HUB	0.06	0.19	1.91	-1.86	0.00
BHE	-2.09	2.87	9.40	-65.05	-2.15
ME	-1.46	1.92	4.38	-54.12	-1.52
SME	-0.96	1.27	2.02	-37.11	-1.02
NH	-0.47	0.61	4.25	-9.65	-0.53
VT	-0.04	0.52	3.89	-6.10	-0.10
BOSTON	-0.14	0.39	5.34	-3.65	-0.20
CMA/NEMA	0.17	0.28	7.03	-1.23	0.11
WMA	0.44	0.43	4.32	-2.93	0.38
SEMA	-0.12	0.42	7.47	-3.63	-0.18
RI	-0.26	0.47	3.26	-6.27	-0.32
CT	0.56	0.70	9.20	-1.35	0.50
SWCT	0.93	0.98	12.71	-3.96	0.87
NOR	1.04	1.09	14.35	-3.89	0.98

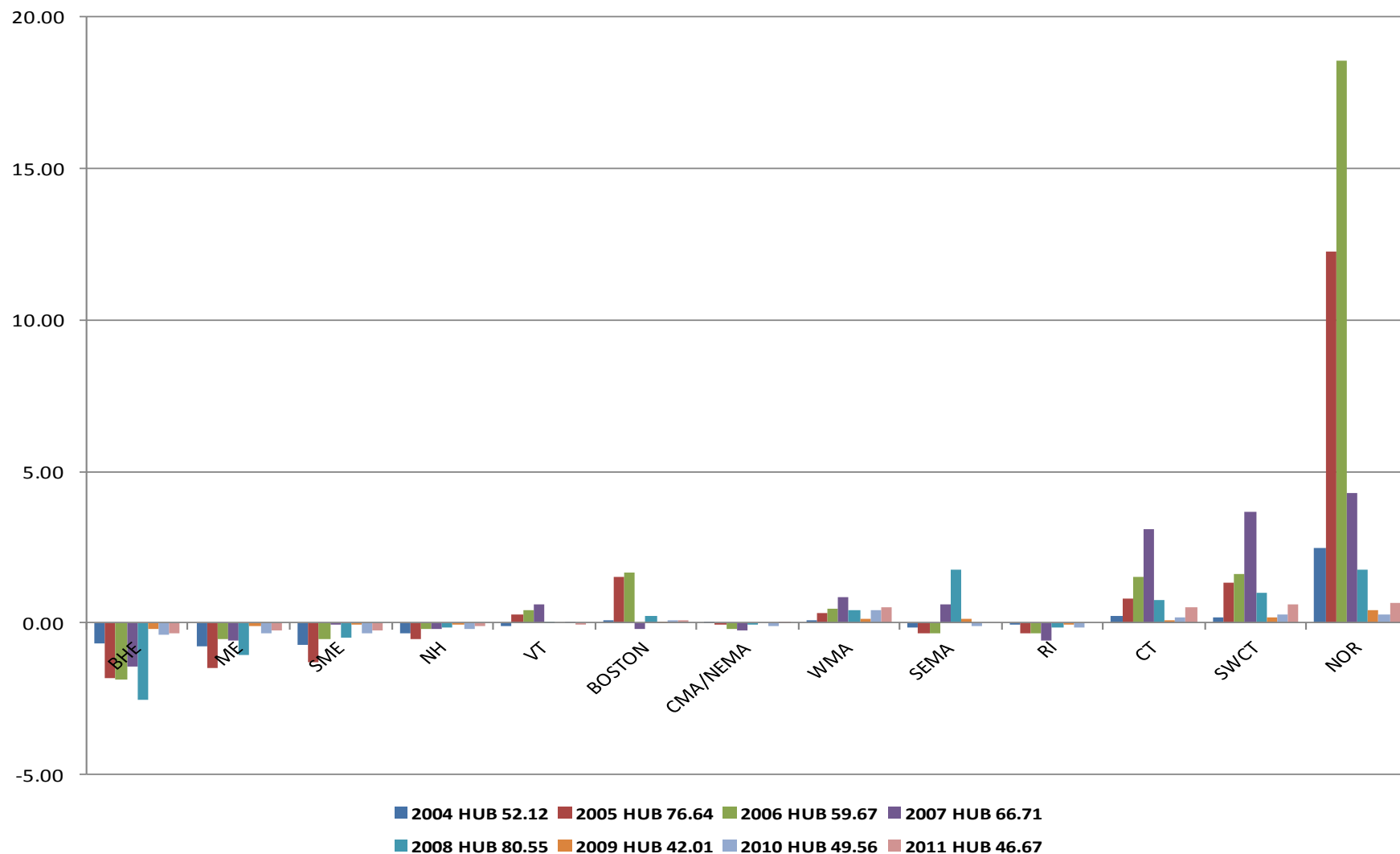
Average Real-time Locational Marginal Prices RSP Sub-areas and HUB



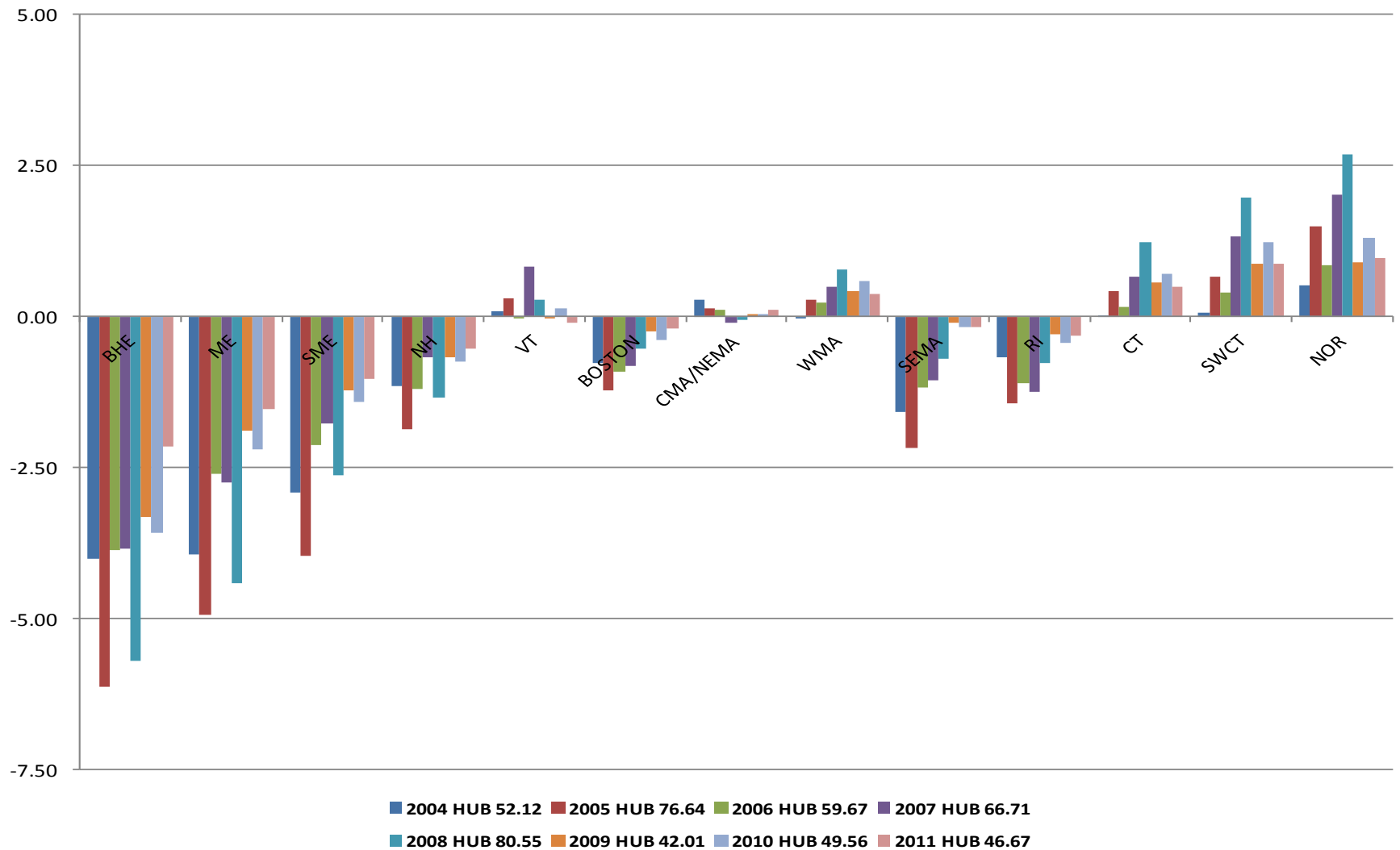
Average Real-time Locational Marginal Prices RSP Sub-area Differences From HUB



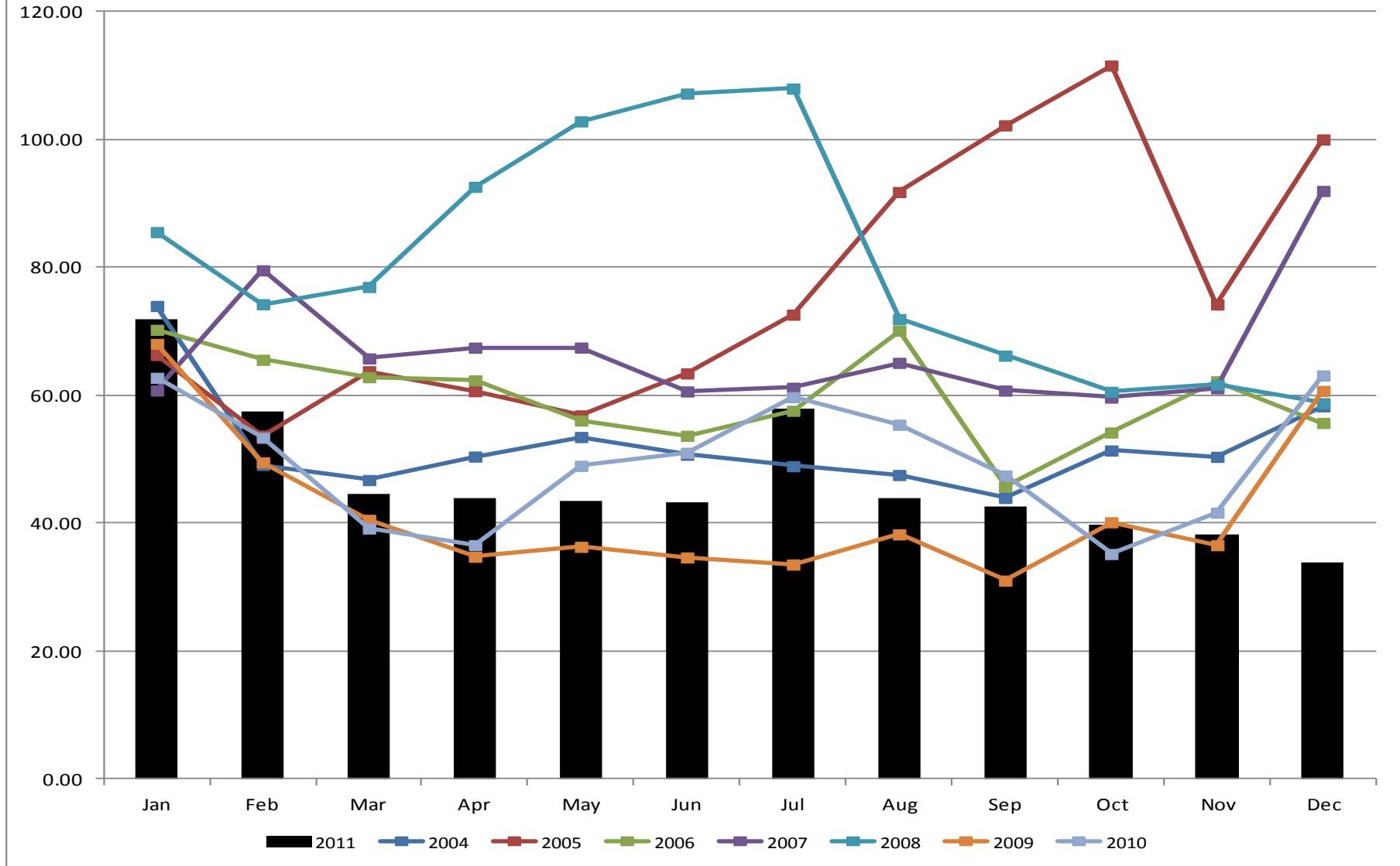
Average Real-time Locational Marginal Price: Congestion Component RSP Sub-area Differences From HUB



Average Real-time Locational Marginal Price: Marginal Loss Component RSP Sub-area Differences From HUB



ISO-NE Monthly Average Real-time Locational Marginal Prices at HUB



Interface Details

- The New York-New England interface runs along the border between the New England Control Area and the New York Control Area. This interface is shown as (1) the Cross Sound Cable-central CT to Long Island, (2) Northport-Norwalk CT to Long Island, and (3) the rest of the AC lines. A positive sign on the data indicates power flow from New England to New York.
- The East-West interface runs south from northern Vermont, through central Massachusetts, and through Connecticut just west of the Rhode Island border. A positive sign on the data indicates power flow from East to West.
- The Maine-New Hampshire interface runs across part of southern Maine. A positive sign on the data indicates power flow from Maine to New Hampshire.
- The BOSTON import interface surrounds the northeastern area of Massachusetts, from north of Gloucester to just south of Boston. A positive sign indicates power flow into NEMA/BOSTON from the rest of New England.

Interface Details, *cont.*

- The Southeastern Massachusetts/Rhode Island (SEMA/RI) export interface surrounds Massachusetts south of Boston and all of the state of Rhode Island. The western edge of the interface is the same as parts of the East-West and BOSTON import interfaces. A positive sign on the data indicates power flow into the rest of New England from SEMA/RI.
- The Connecticut Import interface surrounds most of the state of Connecticut. Its eastern edge is the same as parts of the East-West and SEMA/RI export interfaces. A positive sign indicates power flow into Connecticut from the rest of New England.
- The Southwest Connecticut import interface surrounds the southwestern corner of Connecticut. A positive sign indicates power flow into southwest Connecticut.
- The Norwalk-Stamford interface surrounds the extreme southwestern portion of southwest Connecticut, and lies within the Southwest Connecticut import interface. A positive sign indicates power flow into the region.

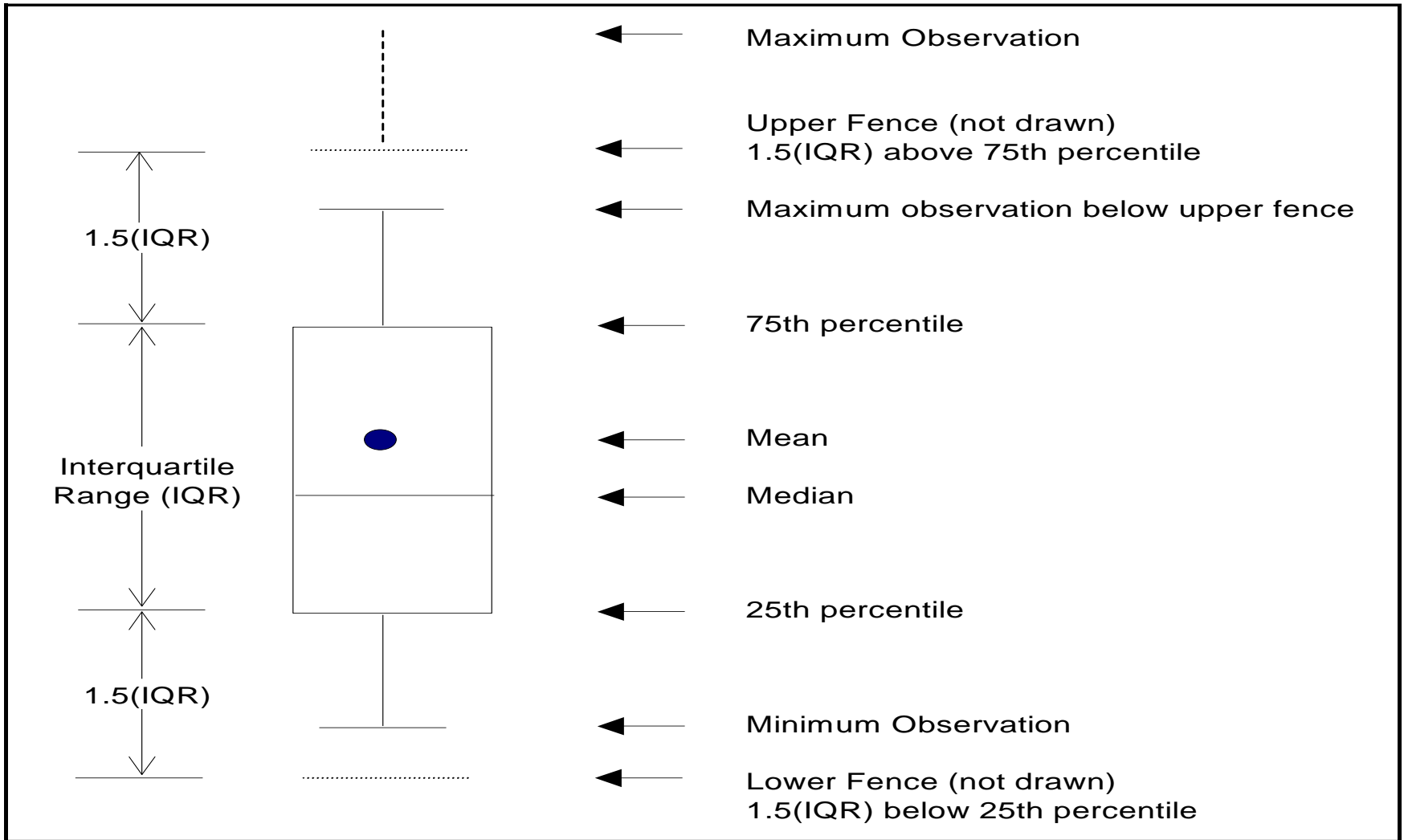
Interface Details, *cont.*

- The North - South interface runs across the southern borders of New Hampshire and Vermont, dividing the ISO-NE area into two separate three-state regions. A positive sign on the data indicates power flow from North to South.
- The Orrington South interface separates the areas north and east of Bangor, mostly owned by Bangor Hydro, from the rest of Maine. A positive sign indicates a southwest power flow towards Portland.
- The Surowiec South interface is just northeast of Portland, and lies across the lines going southwest from Maine Yankee, roughly separating southern ME from the rest of the state. A positive sign indicates power flow into the S-ME subarea.
- The New Brunswick interface connects New England to the Maritimes. A positive sign indicates power flow from New England to the Maritimes.
- The HQ Phase II interface connects New England to the Hydro Quebec System. A positive sign indicates power flow from New England to HQ.

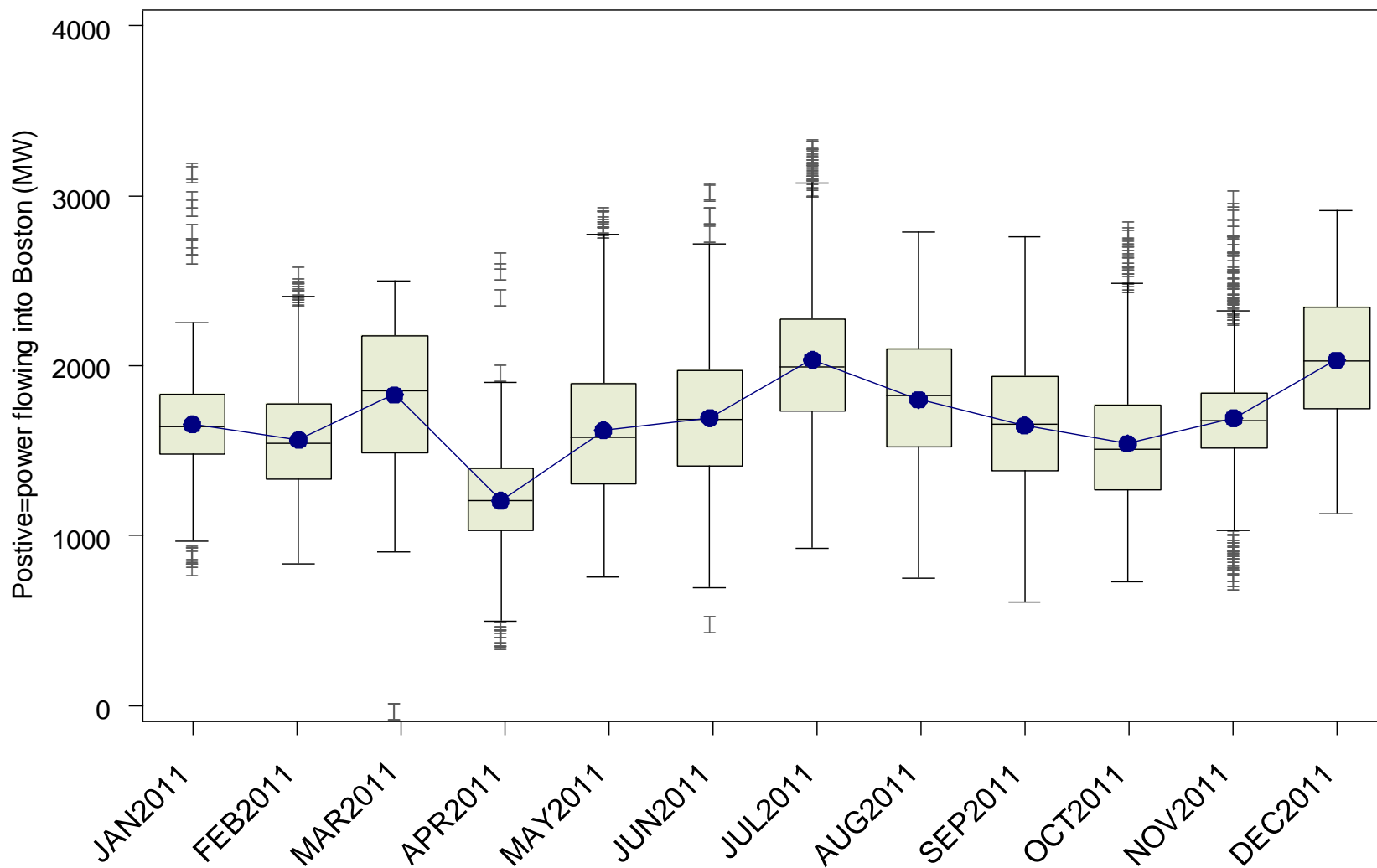
Interface Details, *cont.*

- The East to West CT interface is generally west of the Connecticut river, excluding the Hartford area. A positive sign on the data indicates power flow from East to West.
- On-peak hours are defined as non-holiday weekdays from 8 AM to 11 PM.
- For a technical description of the interfaces see the “Generic Interface Constraints” spreadsheet at http://www.iso-ne.com/markets/hrly_data/support_docs/generic_interface_constraints.xls.

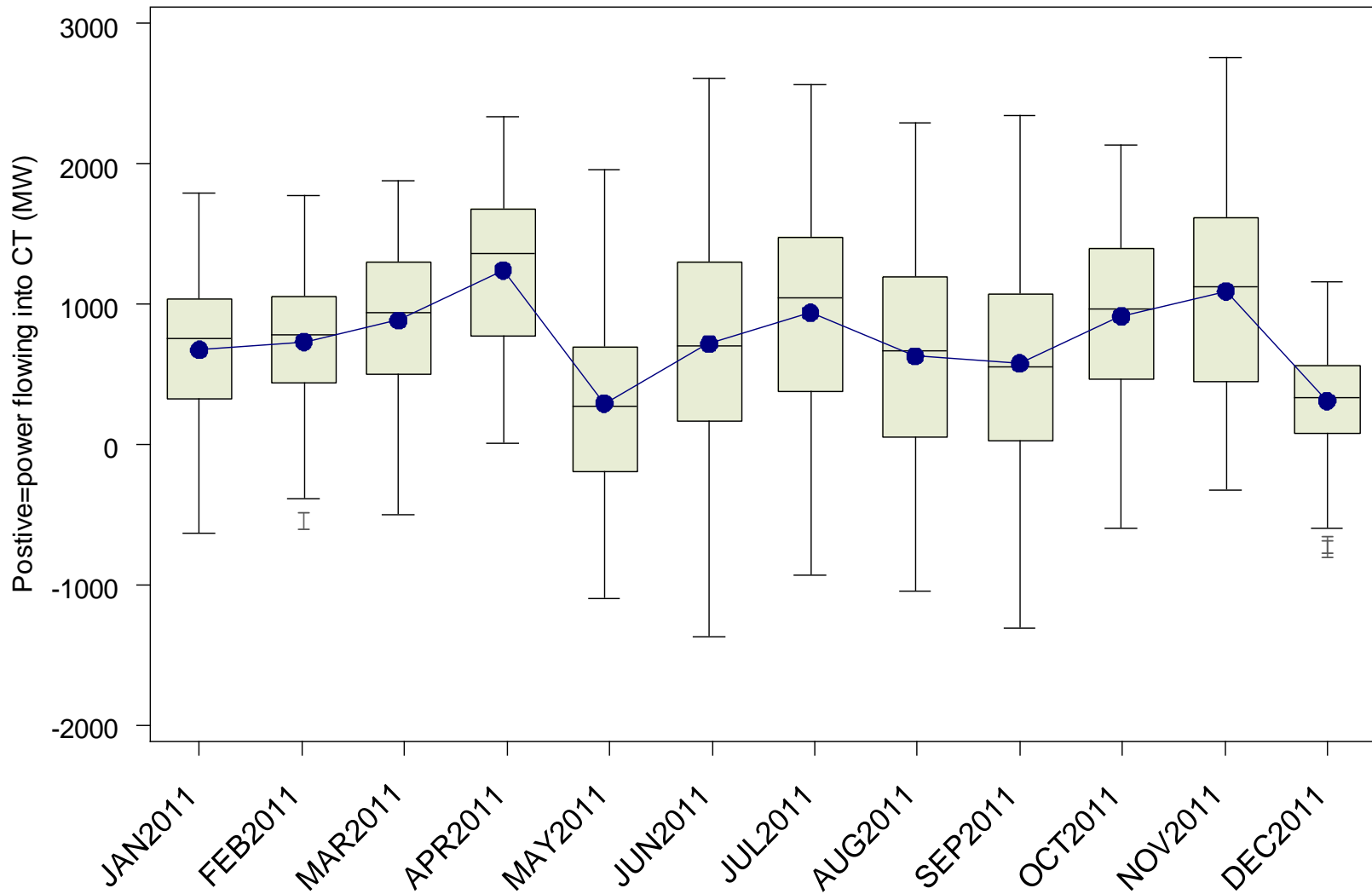
Box and Whisker Plot



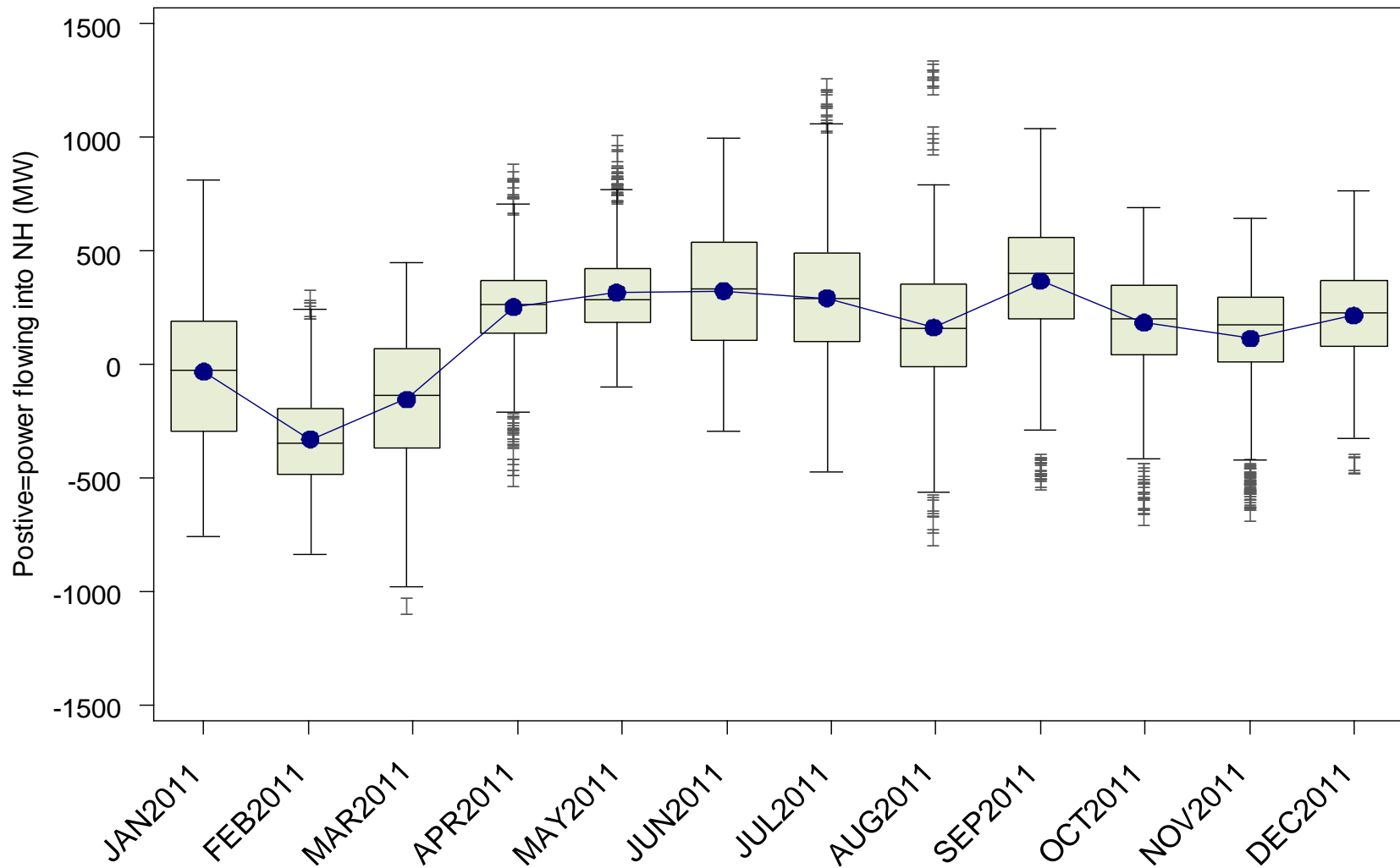
Boston Import Interface Net Flows by Month



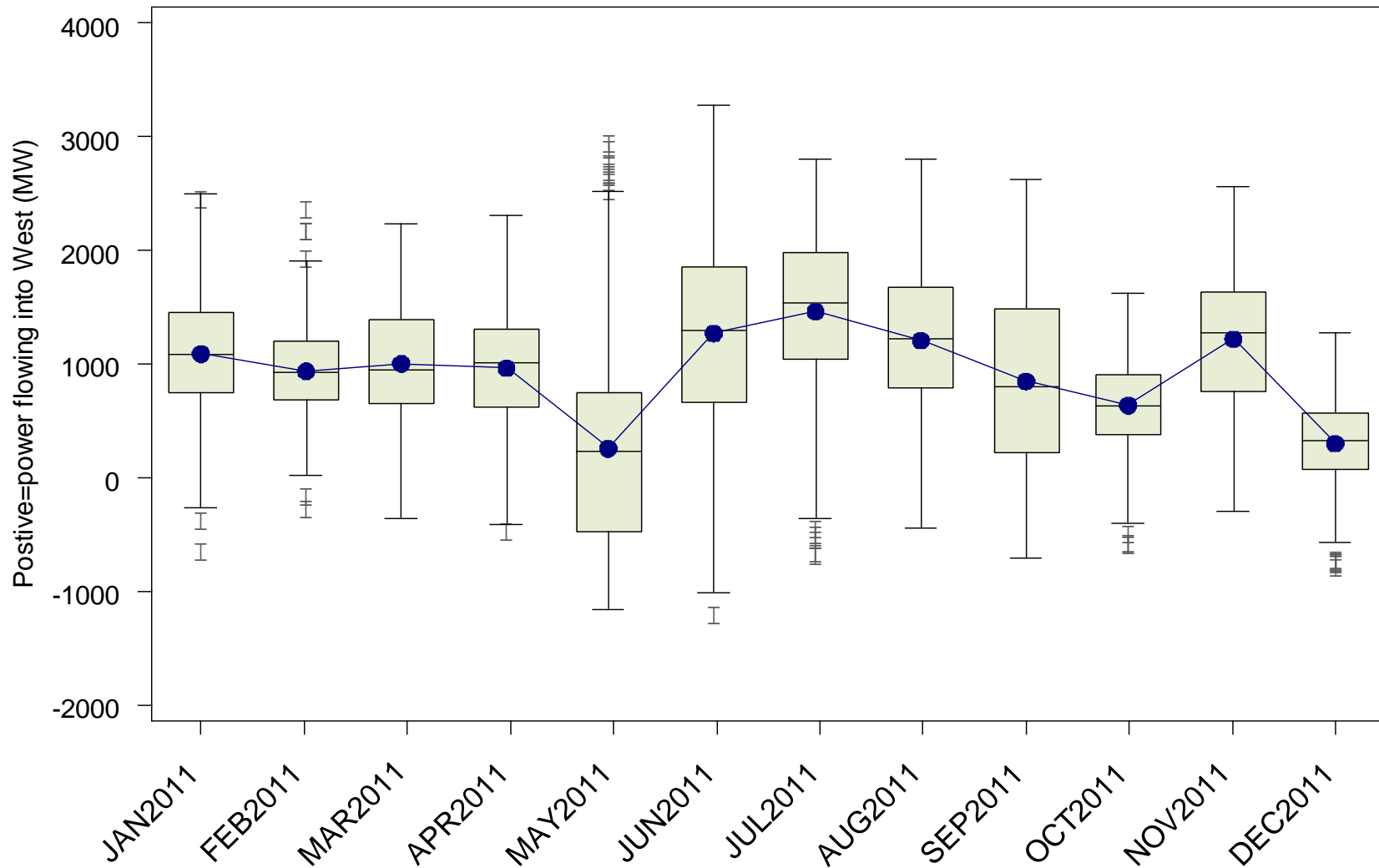
Connecticut Import Interface Net Flows by Month



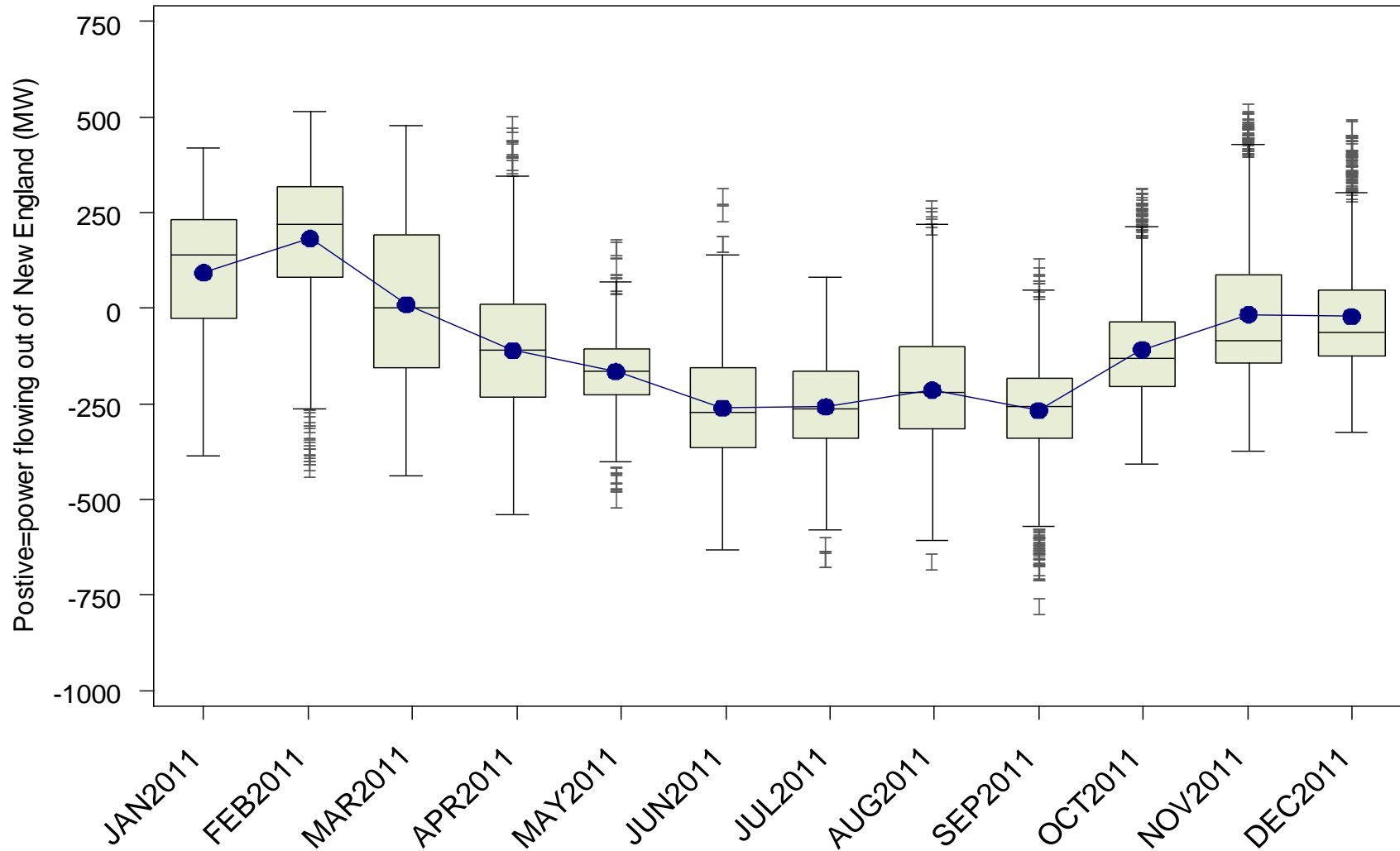
Maine-New Hampshire Interface Net Flows by Month



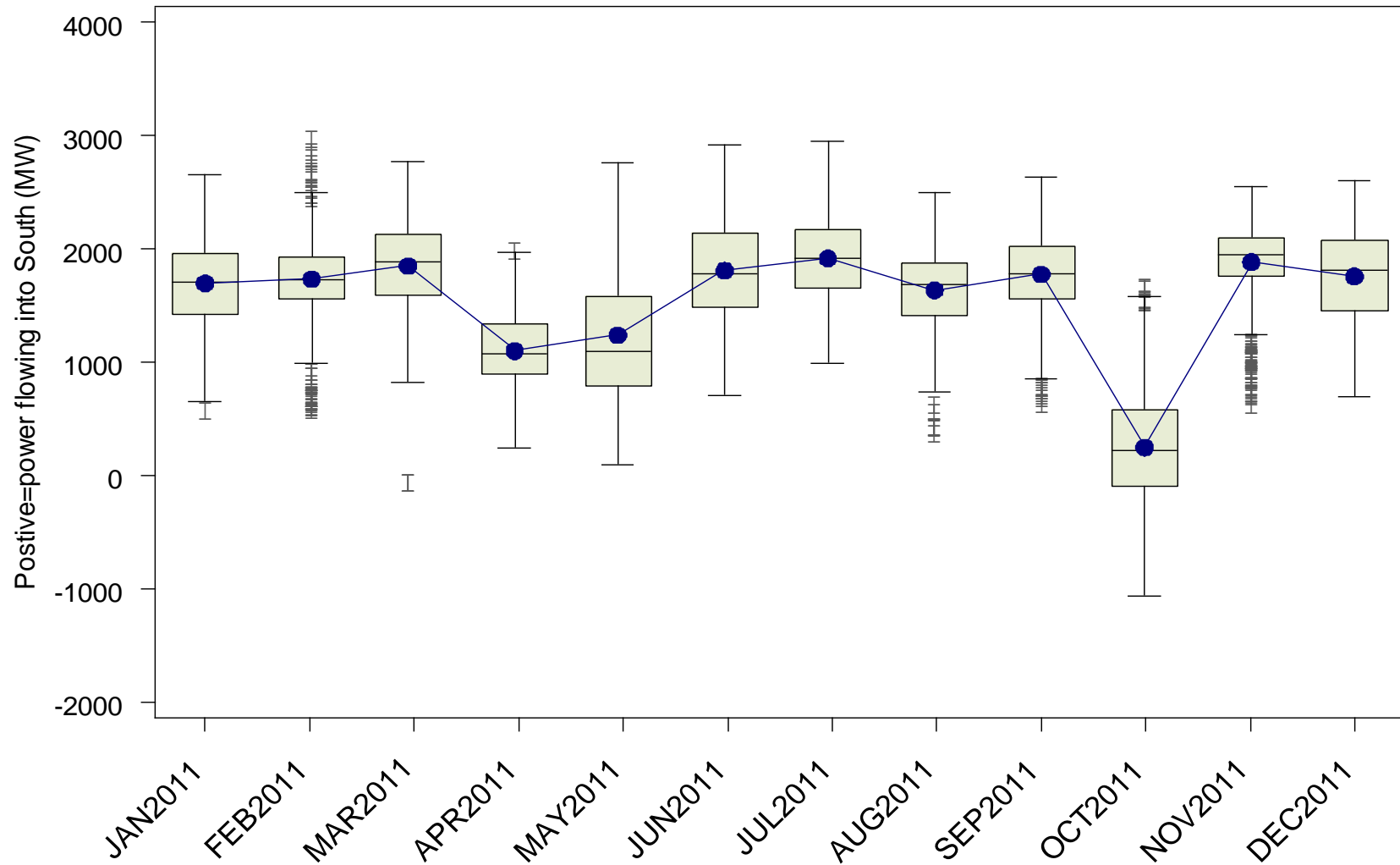
East-West Interface Net Flows by Month



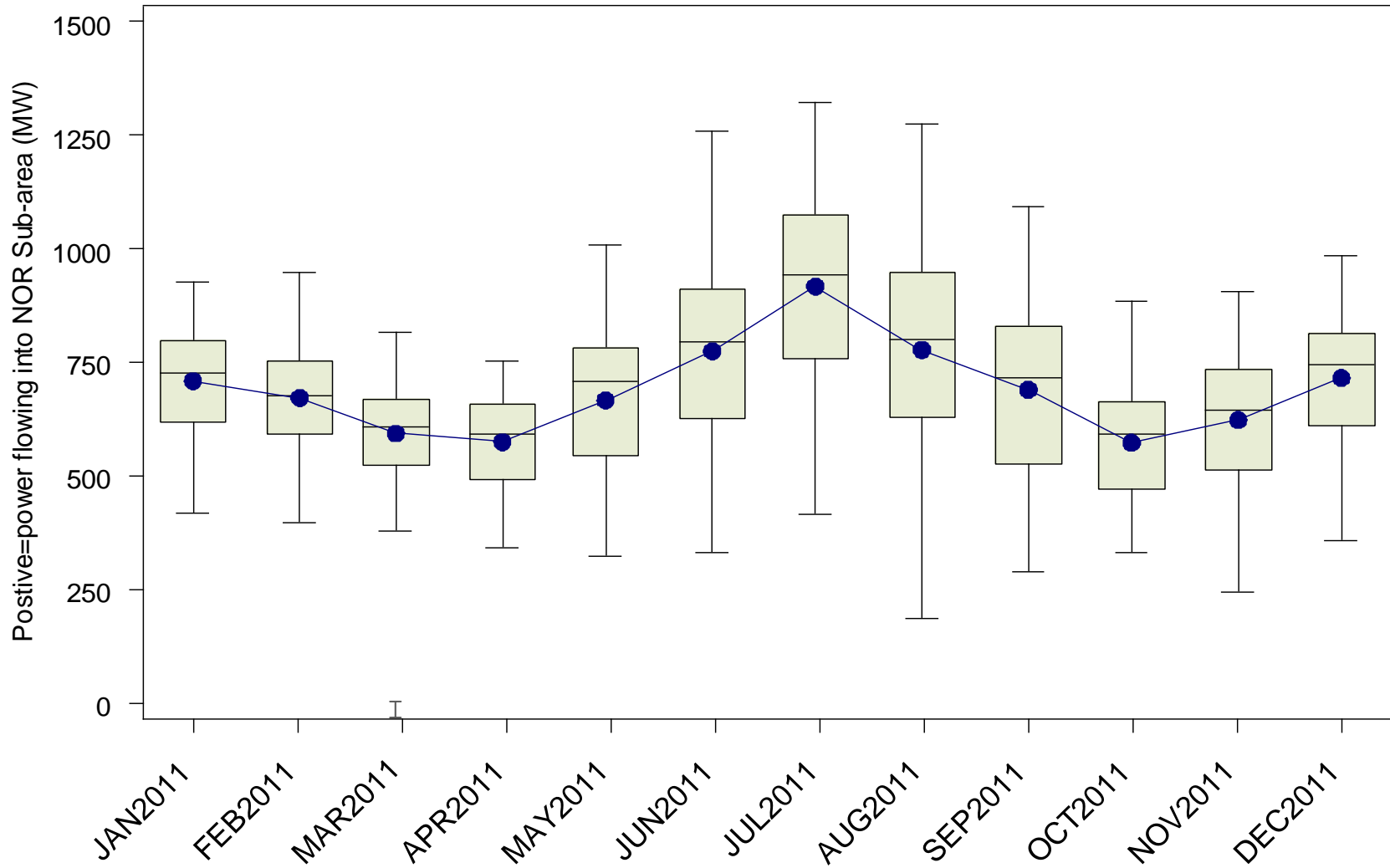
New Brunswick Interface Net Flows by Month



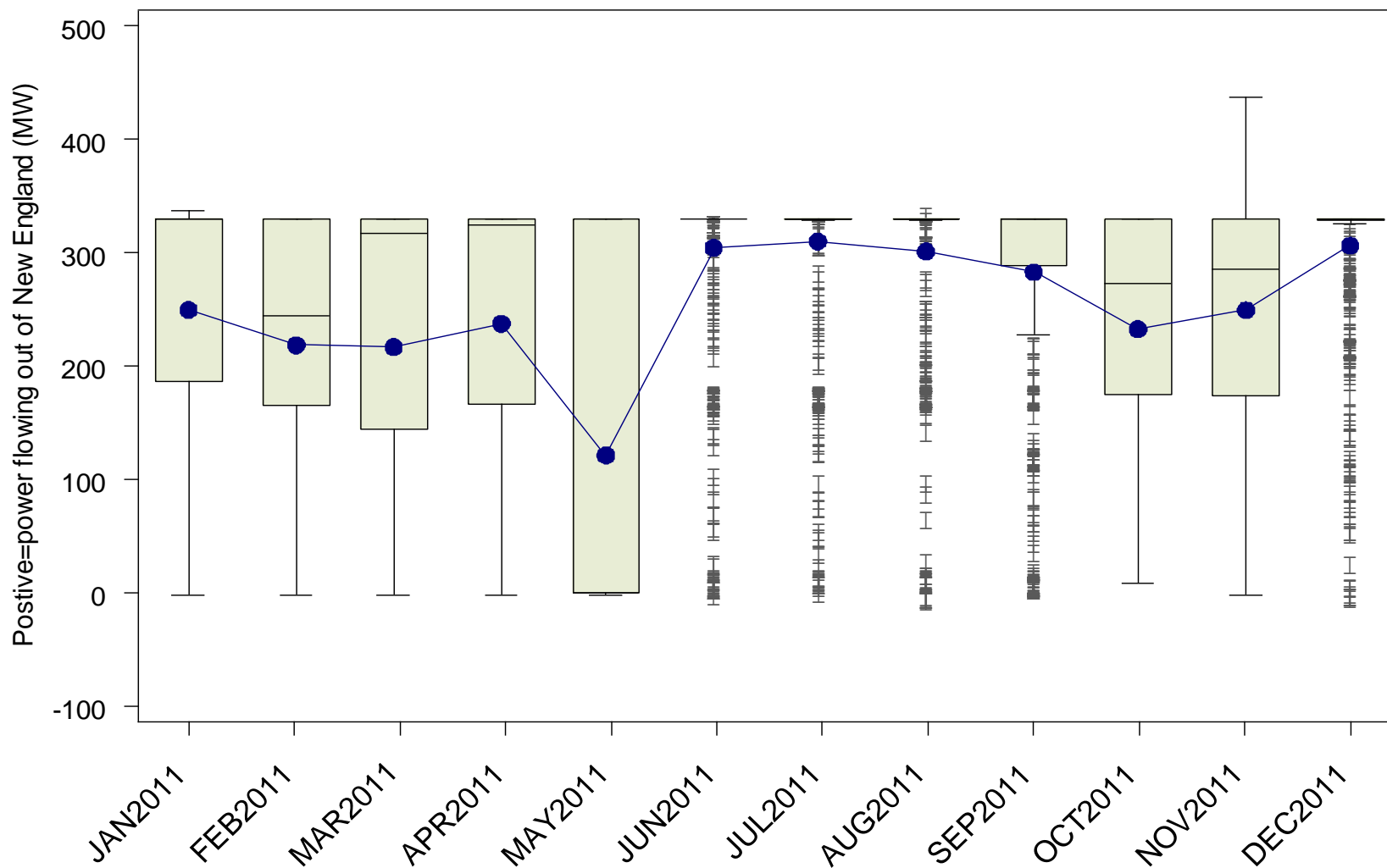
North-South Interface Net Flows by Month



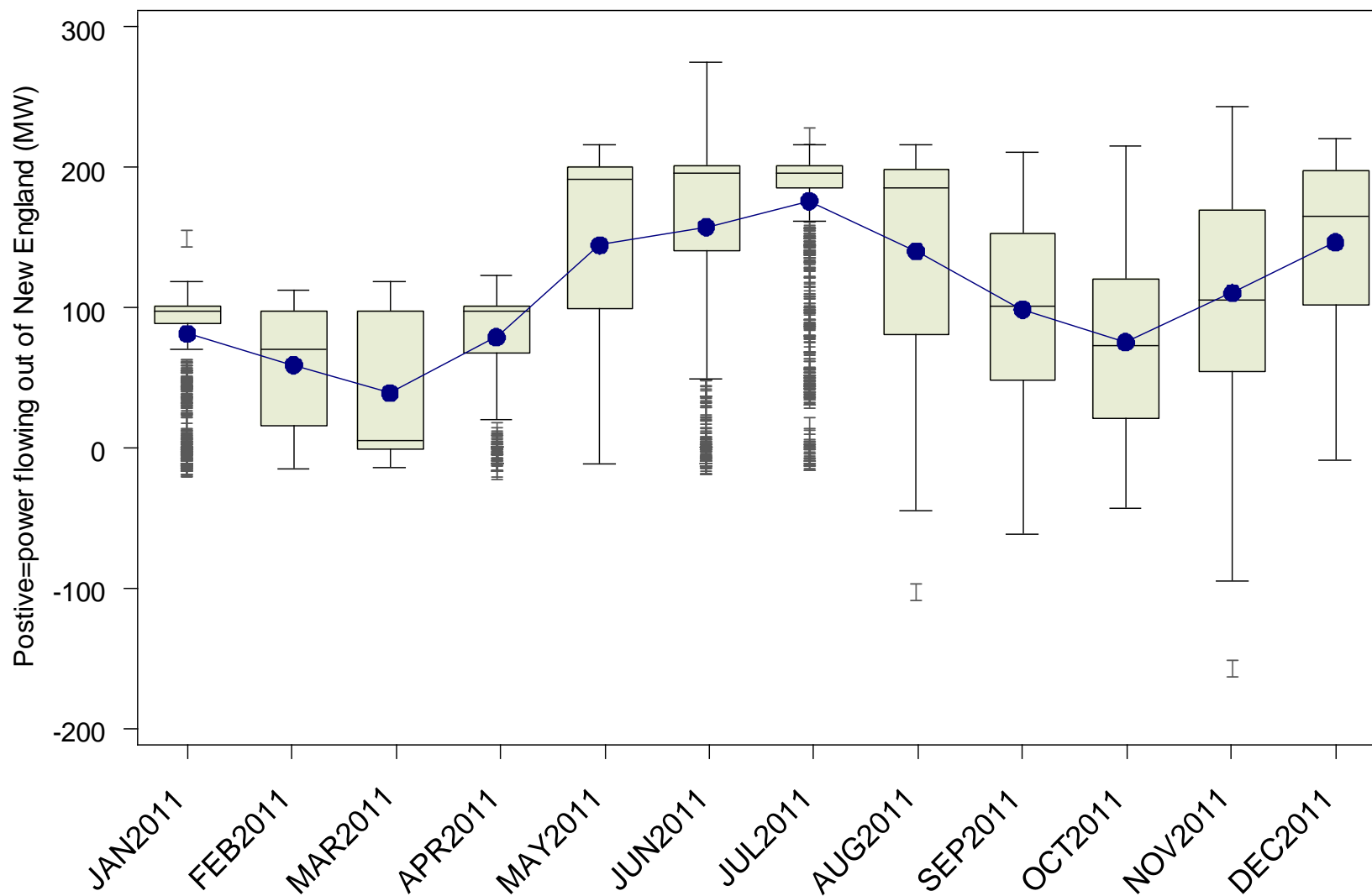
Norwalk-Stamford Interface Net Flows by Month



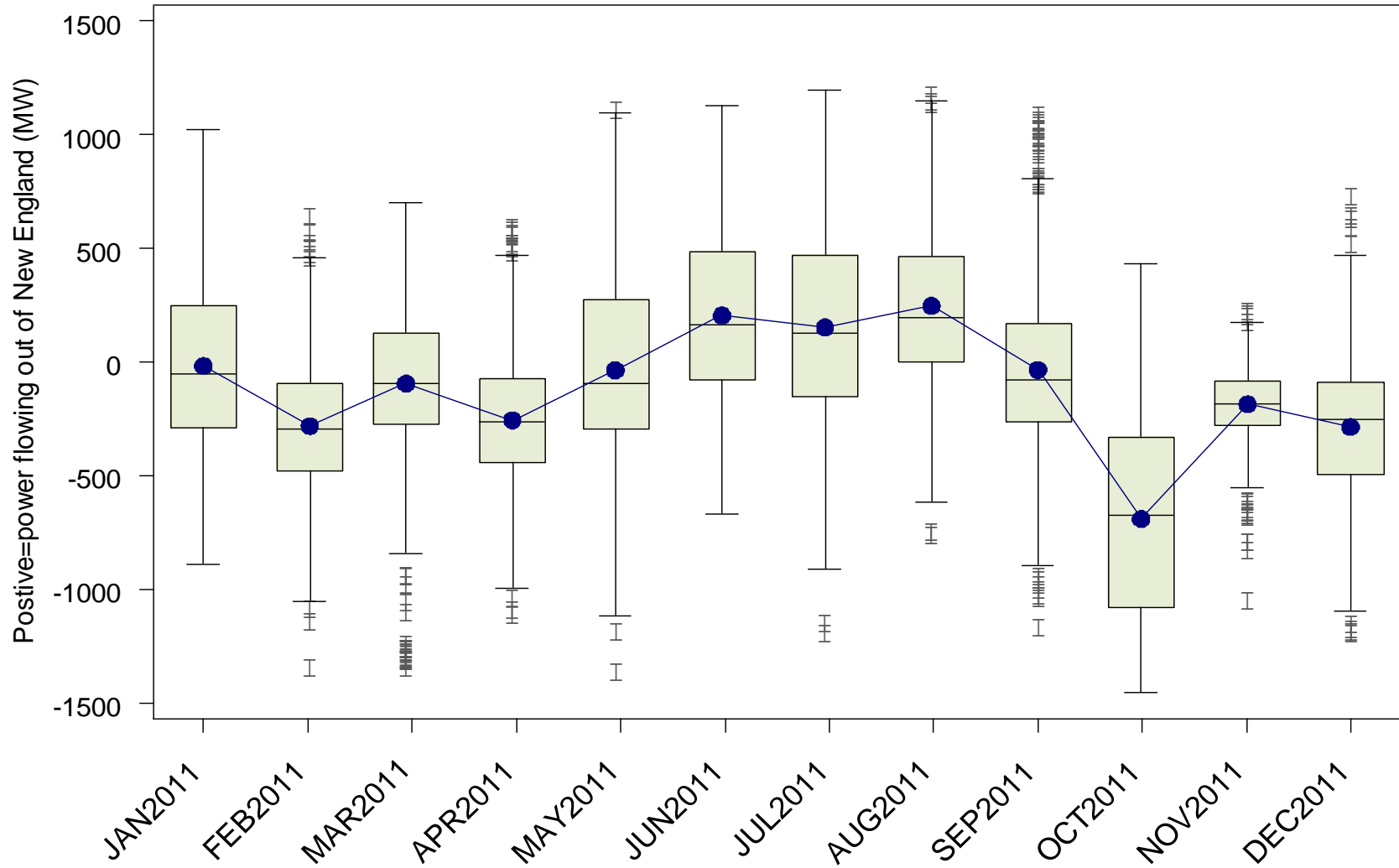
NE-NY Cross Sound Cable Interface Net Flows by Month



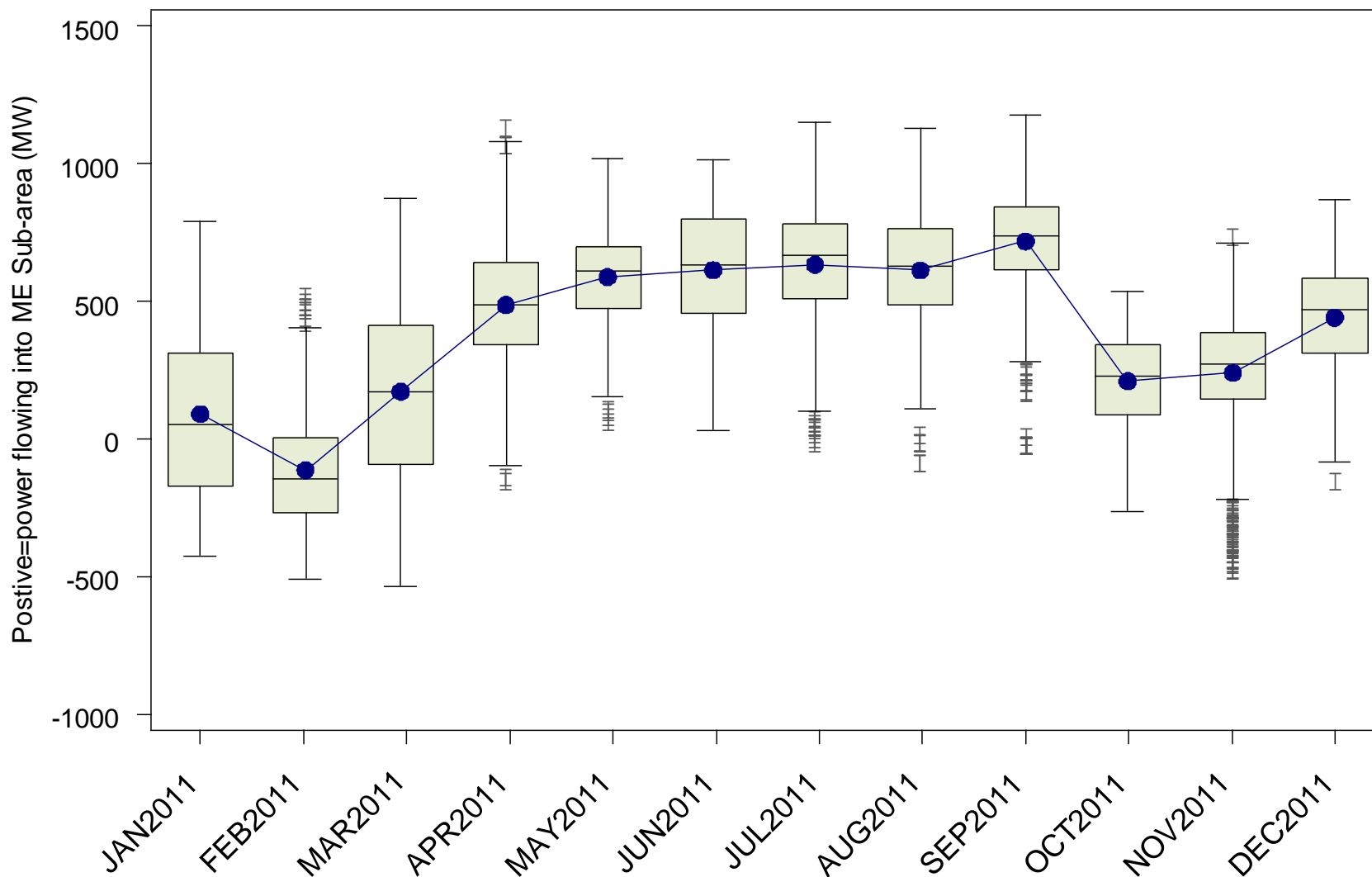
NE-NY Northport Interface Net Flows by Month



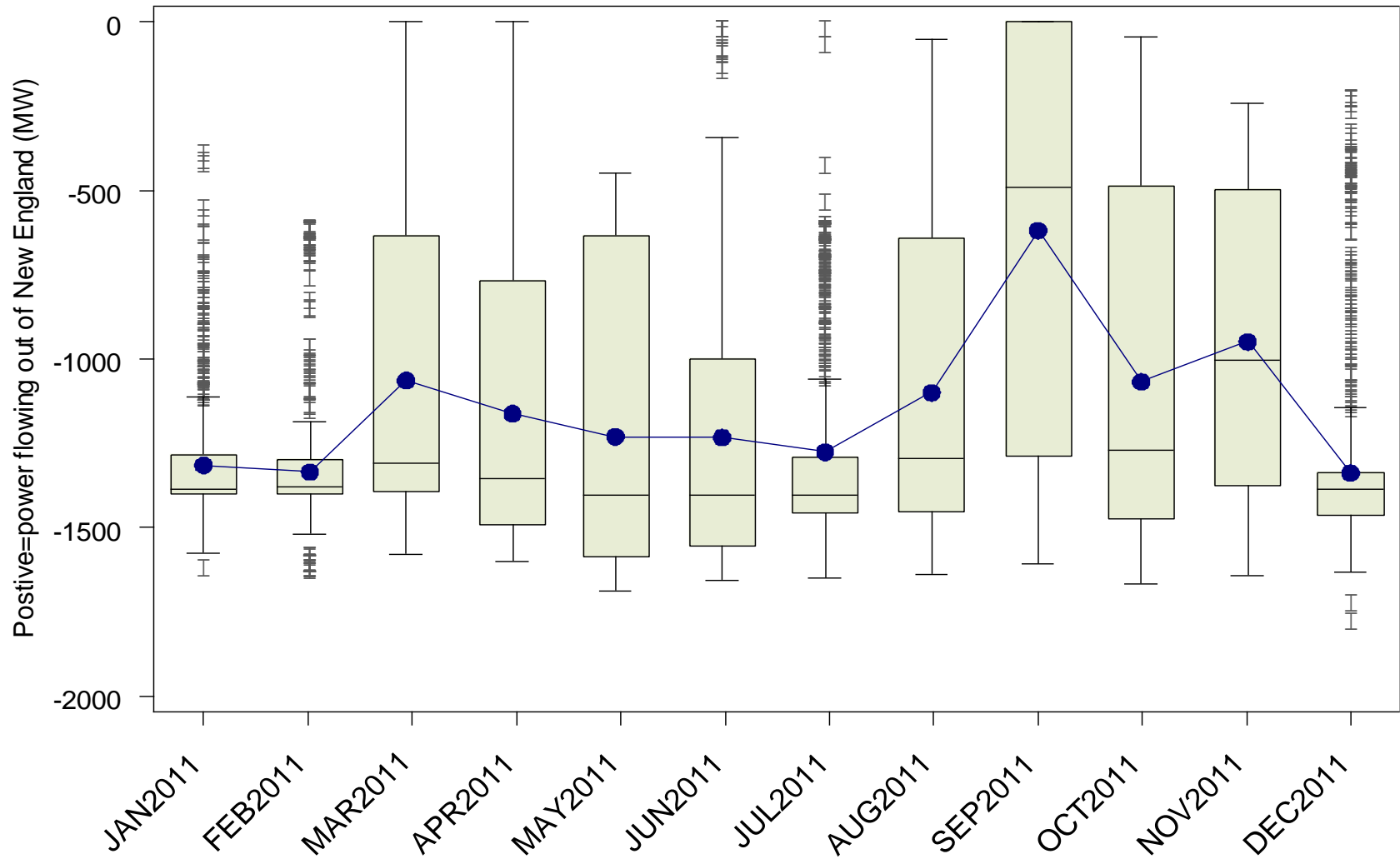
NE-NY Rest of AC Ties Interface Net Flows by Month



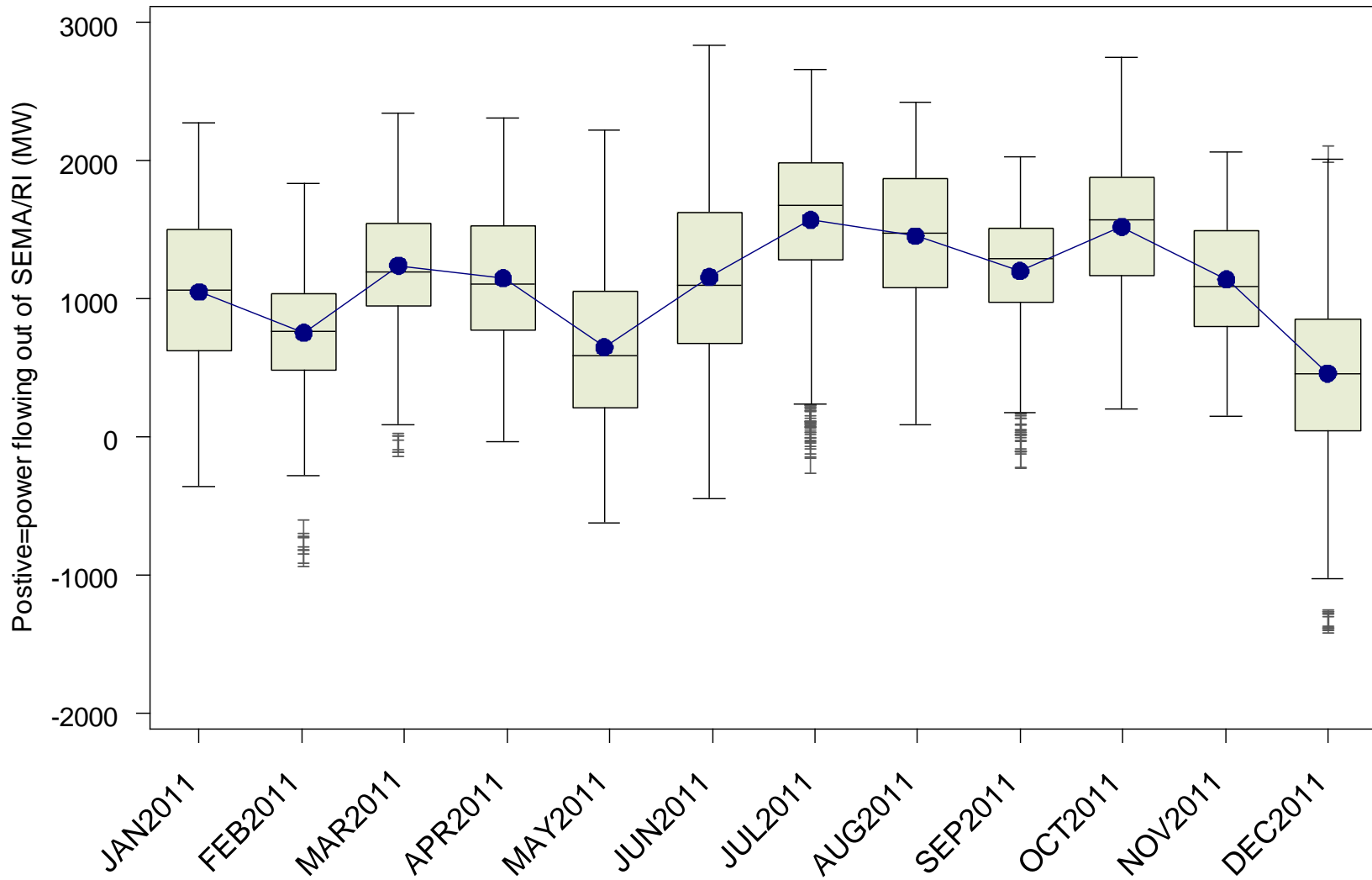
Orrington South Interface Net Flows by Month



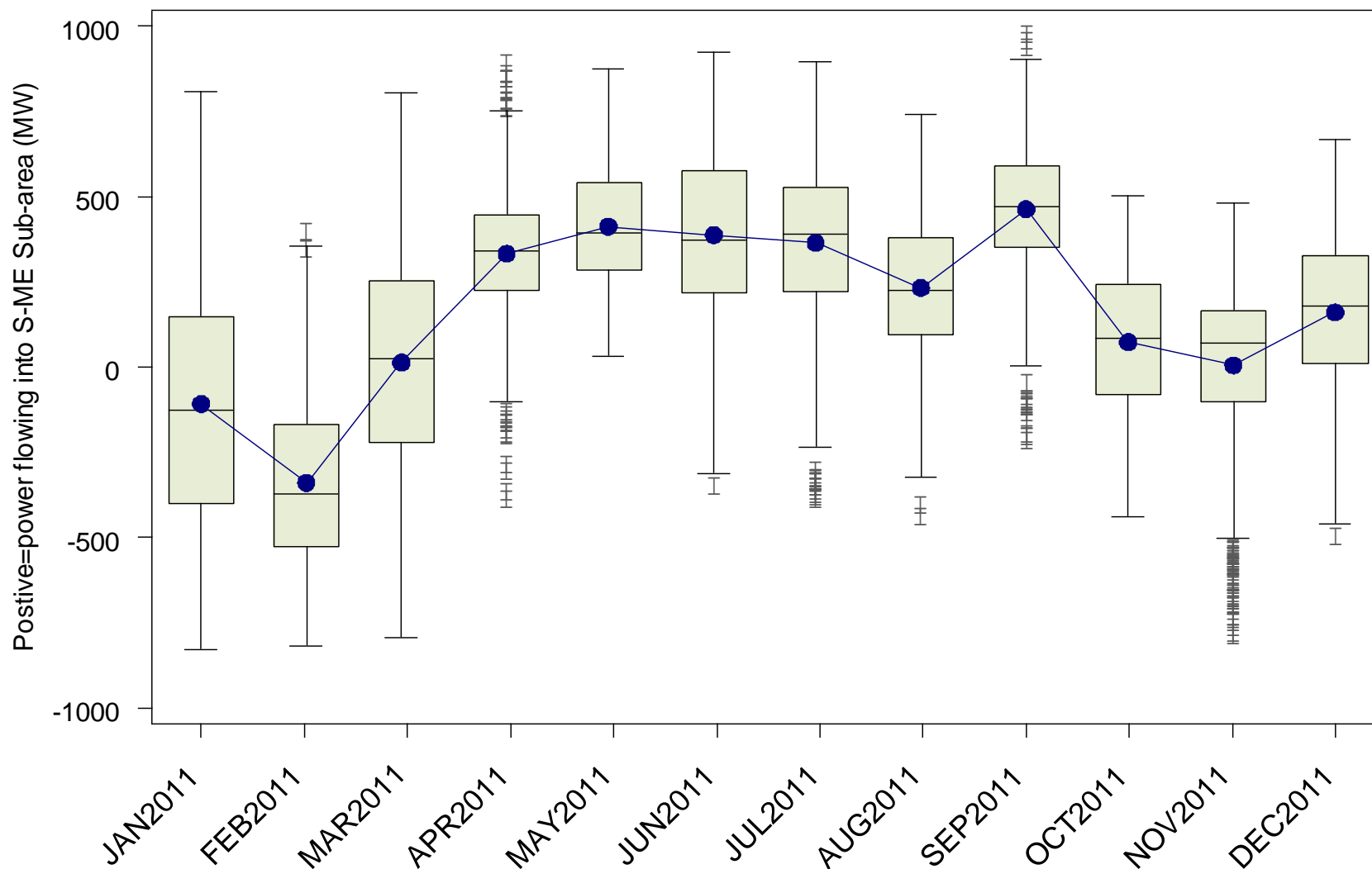
HQ Phase II Interface Net Flows by Month



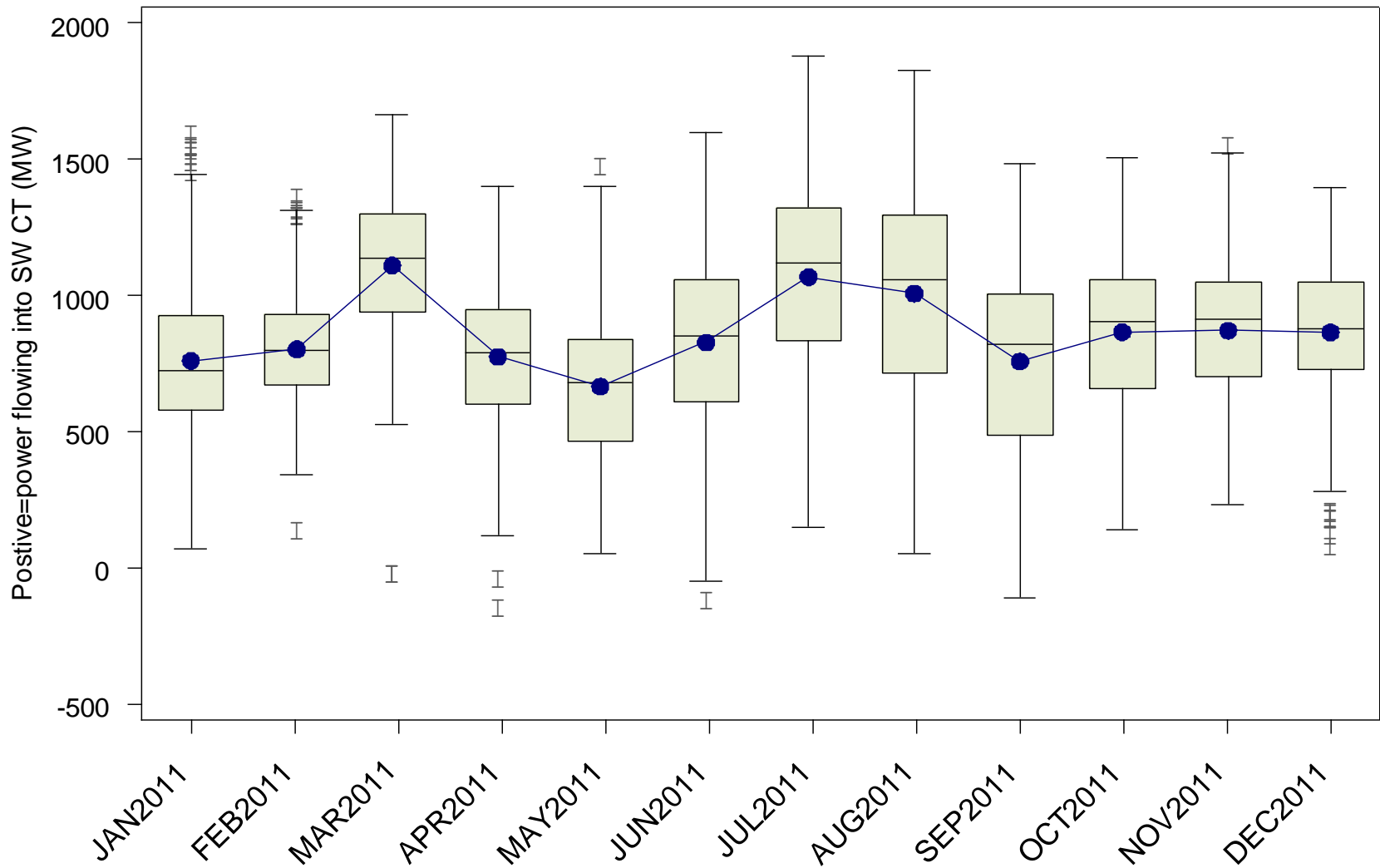
SEMA/RI Export Interface Net Flows by Month



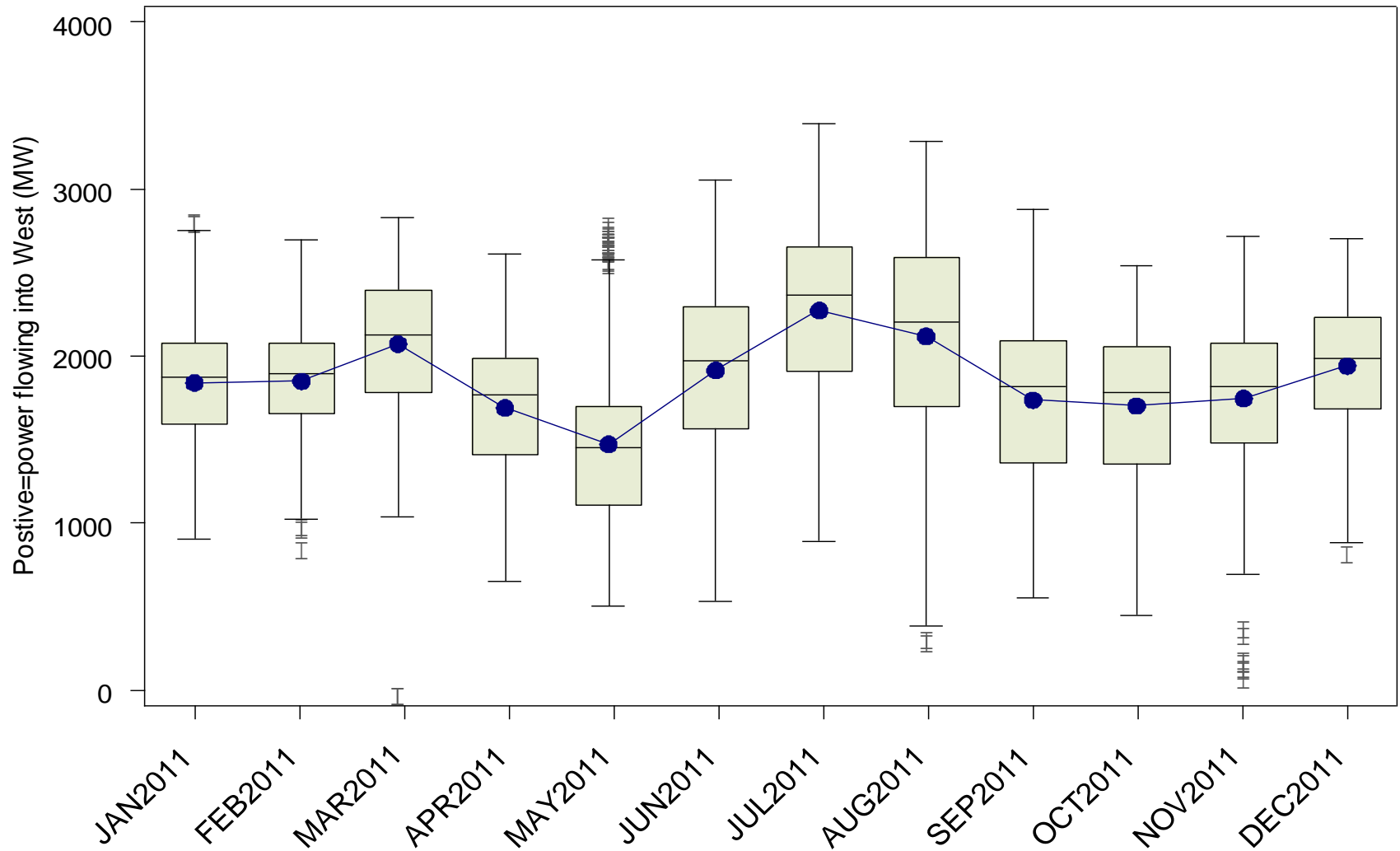
Surowiec South Interface Net Flows by Month



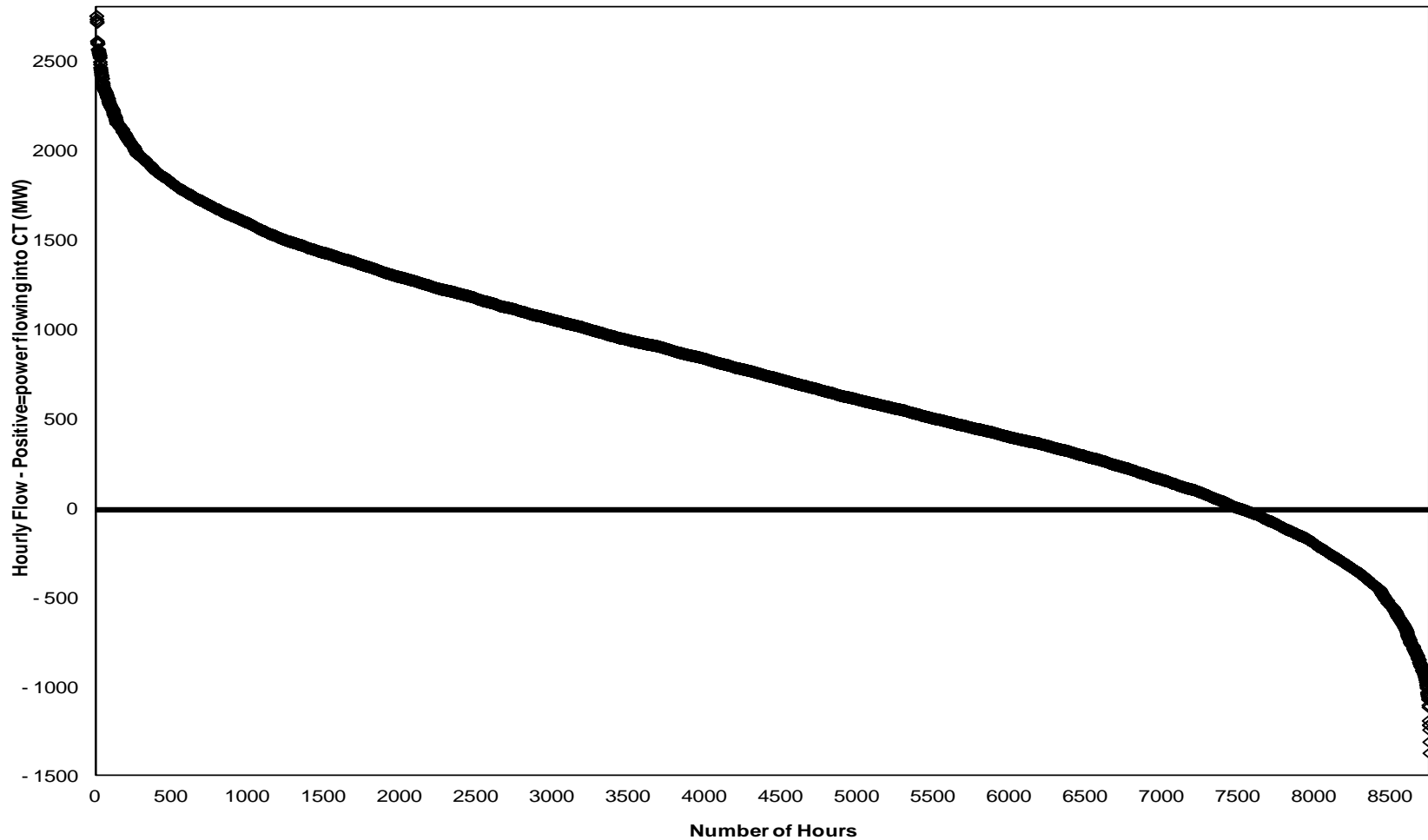
Southwest CT Import Interface Net Flows by Month



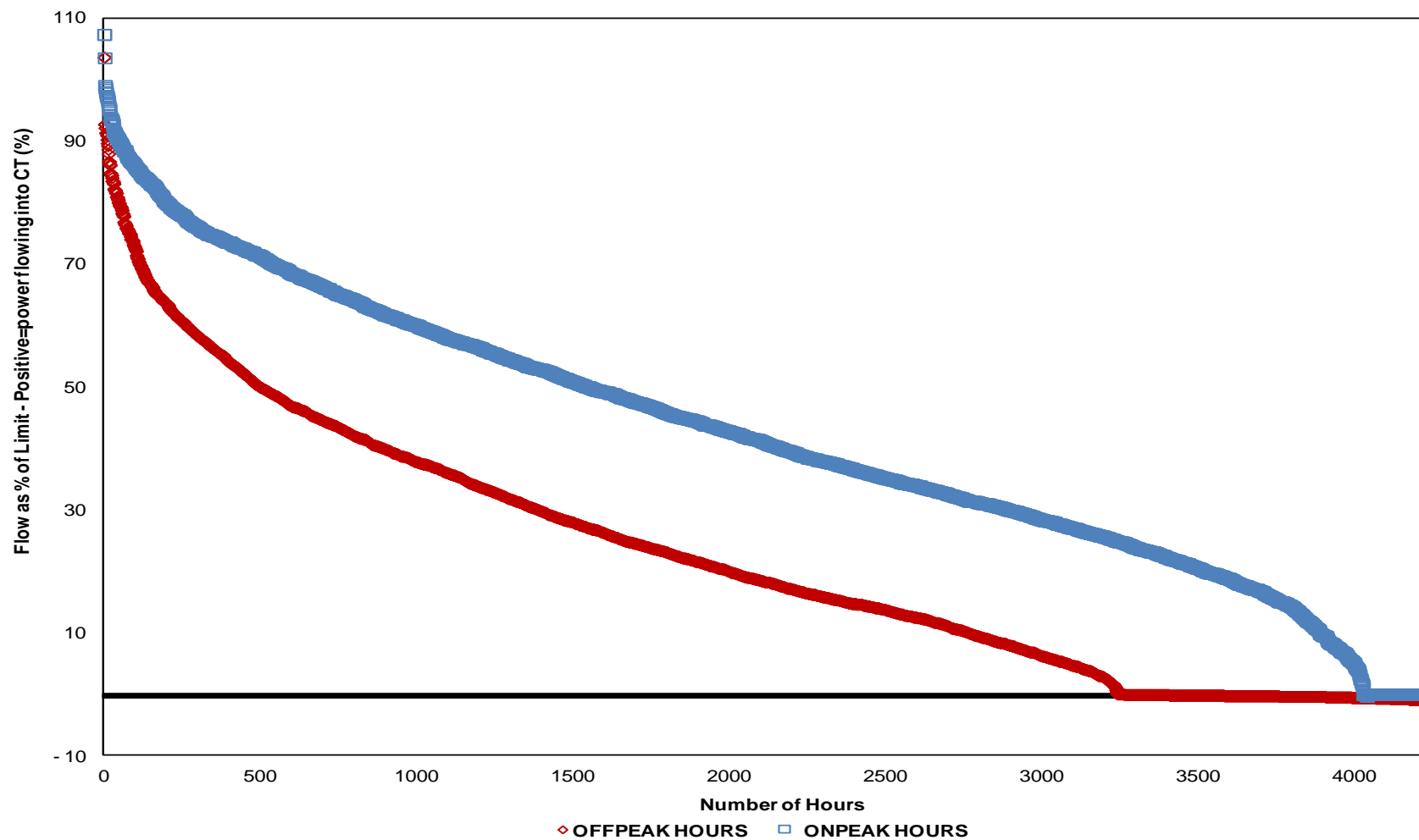
East-West CT Interface Net Flows by Month



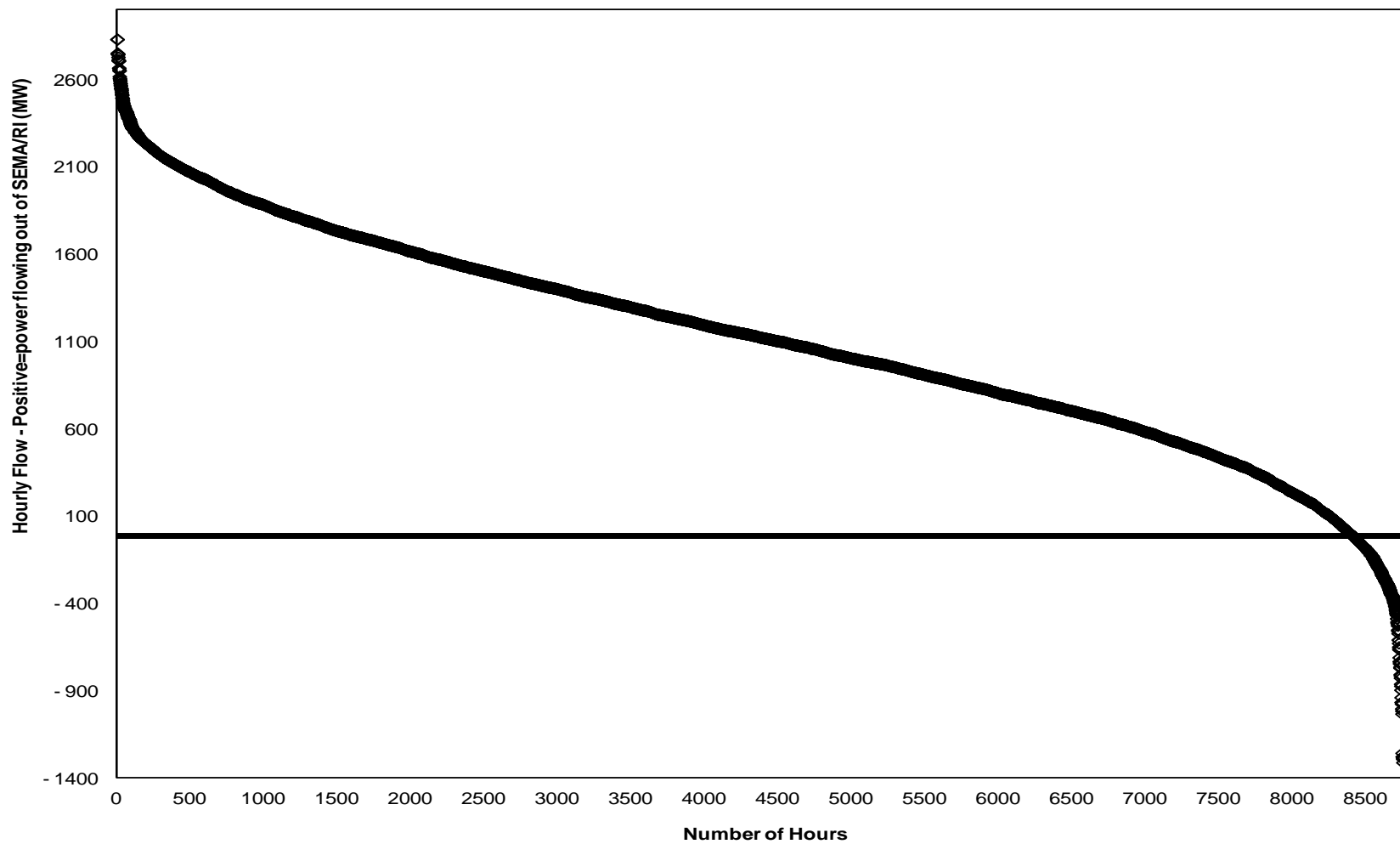
Connecticut Import Interface Duration Curve: Net Flow MWs
January - December 2011



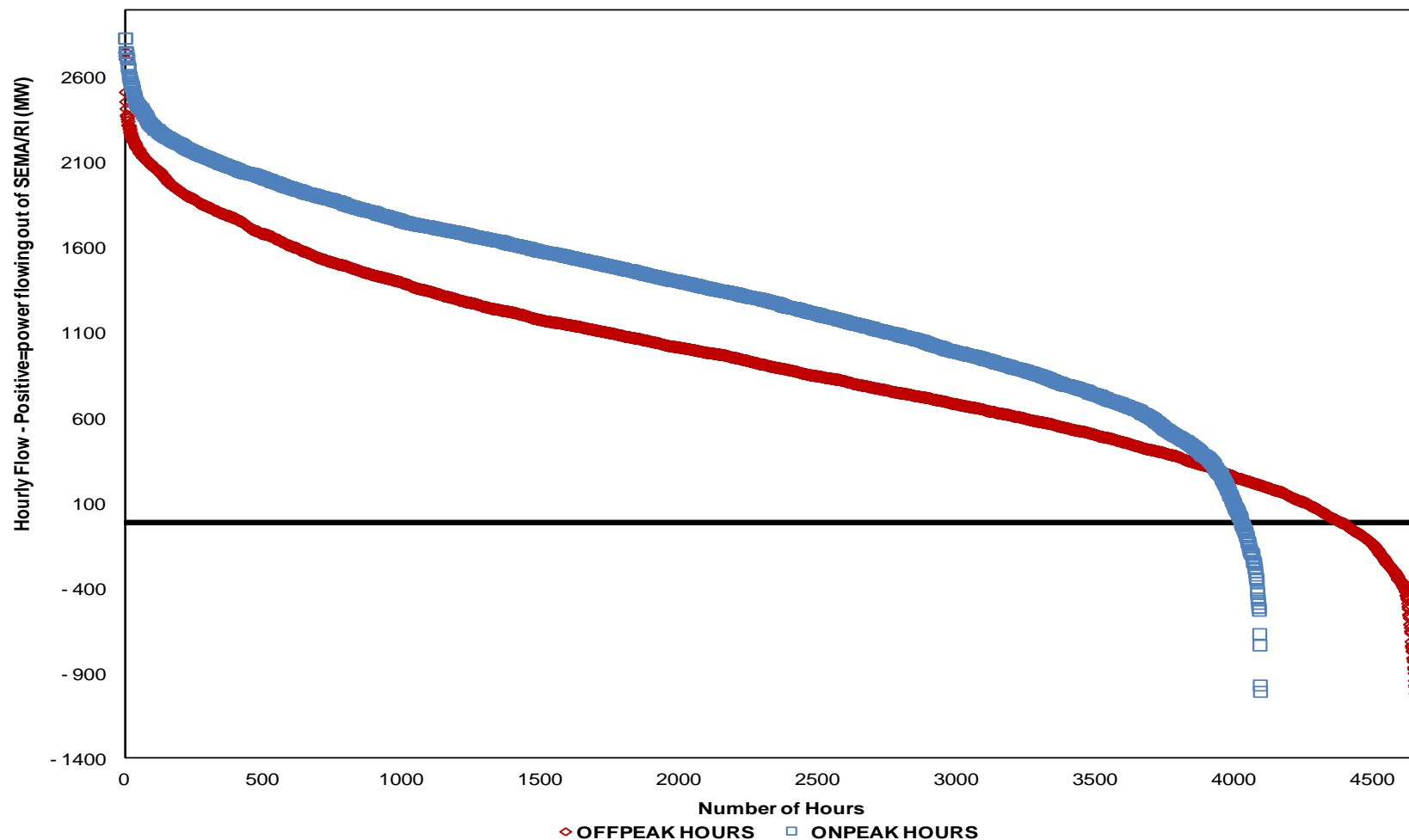
Connecticut Import Interface Duration Curve: Net Flow as % of Interface Limit
January - December 2011



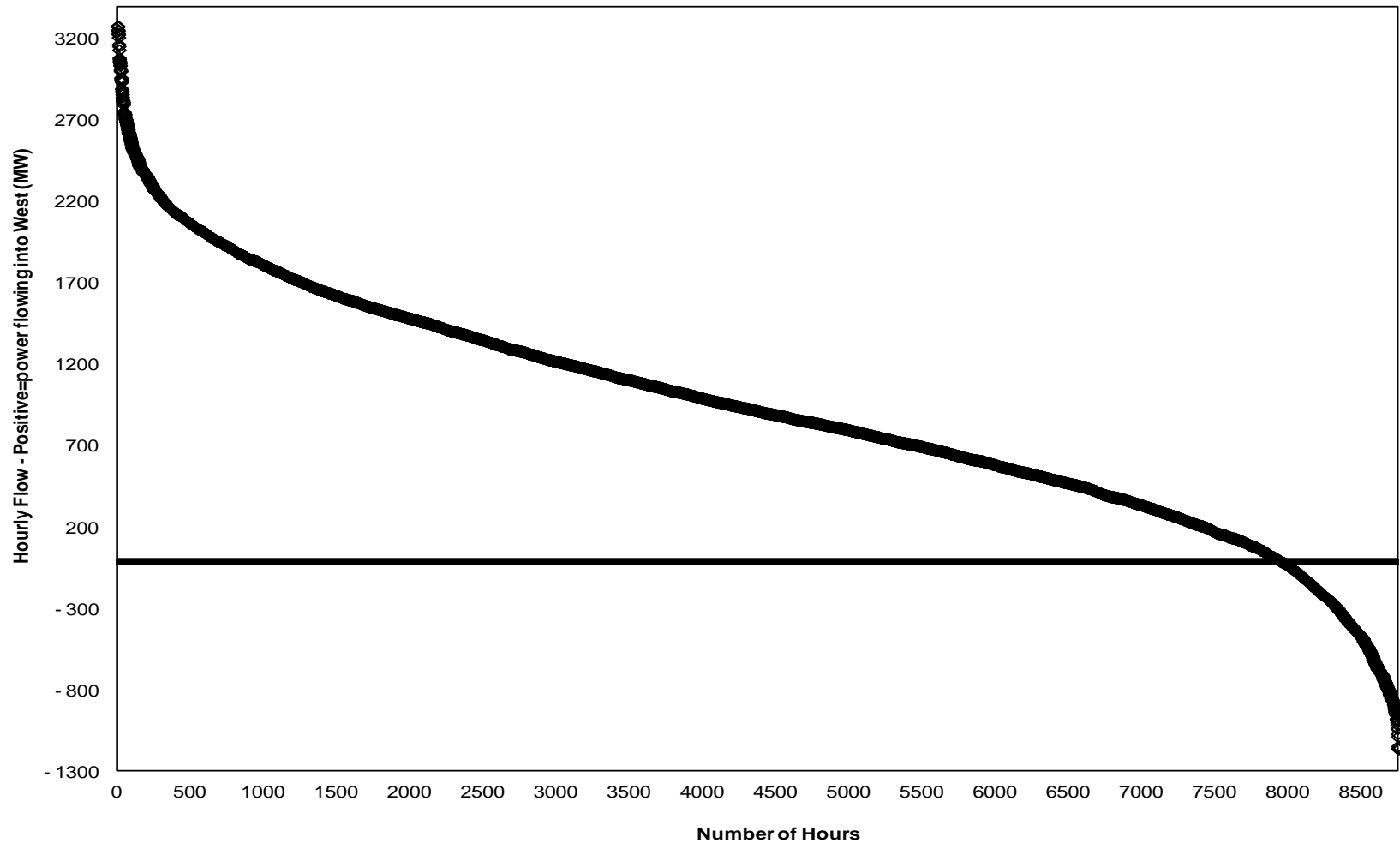
SEMA/RI Export Interface Duration Curve: Net Flow MWs
January - December 2011



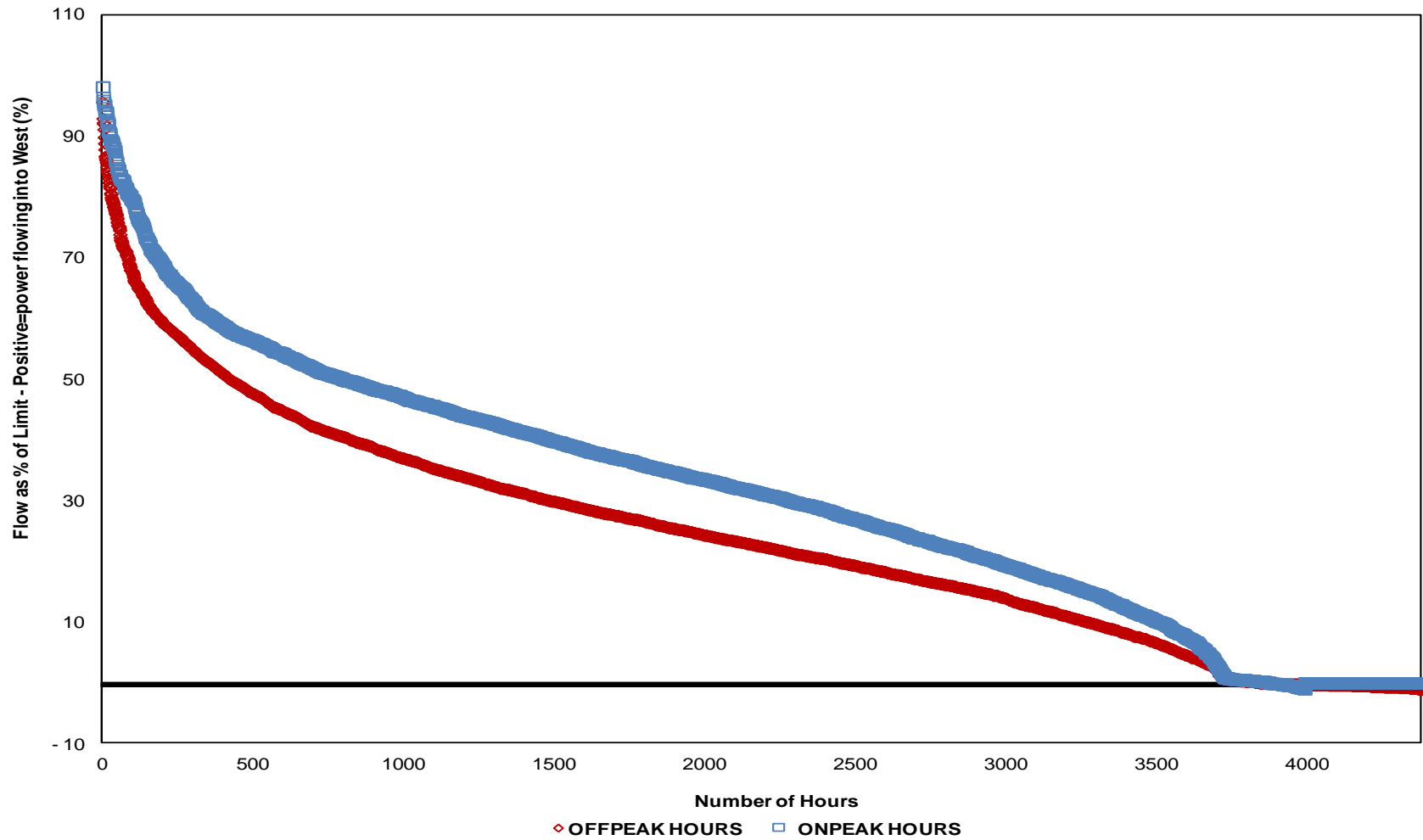
SEMA/RI Export Interface Duration Curve: Net Flow MWs
January - December 2011



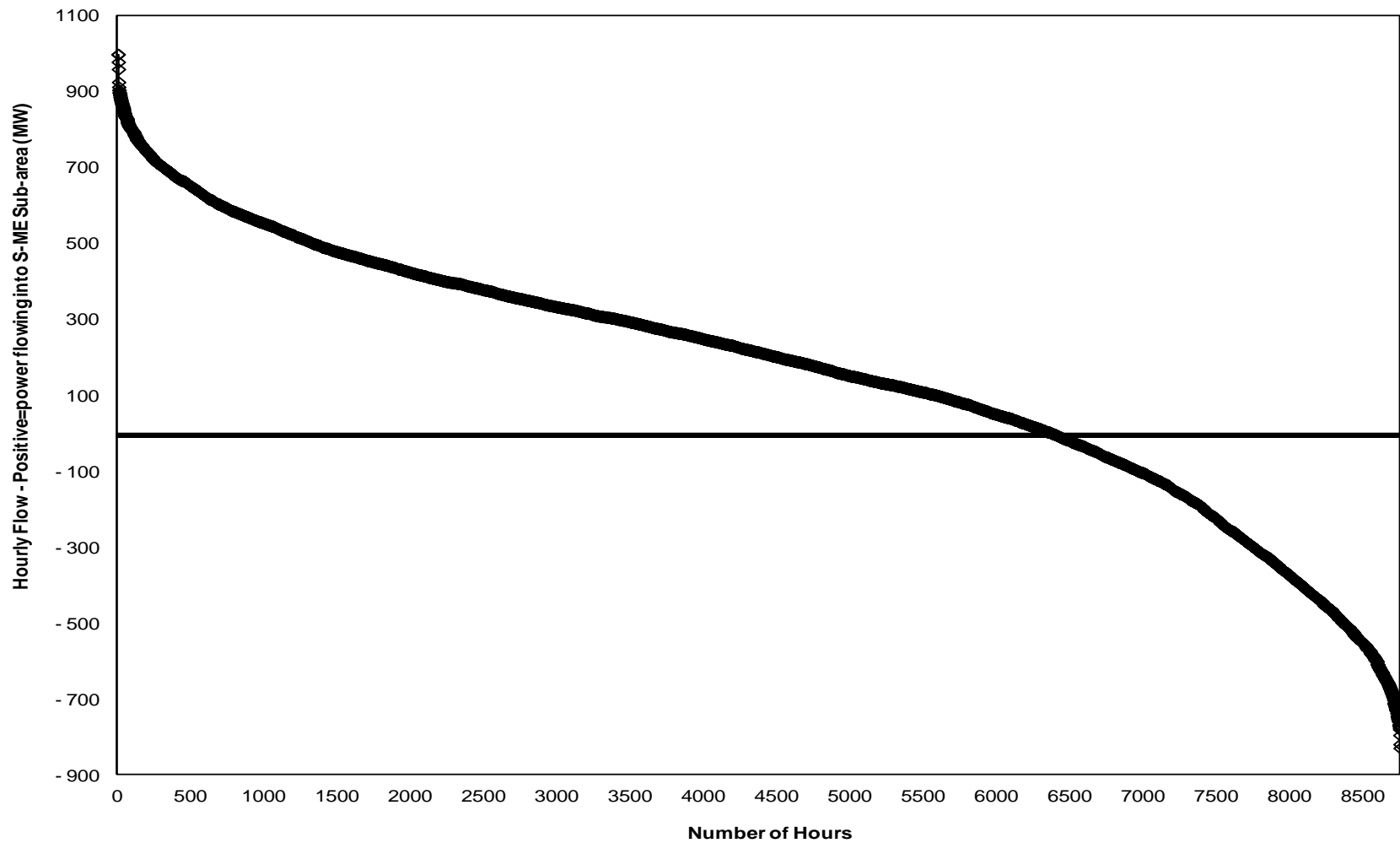
East-West Interface Duration Curve: Net Flow MWs
January - December 2011



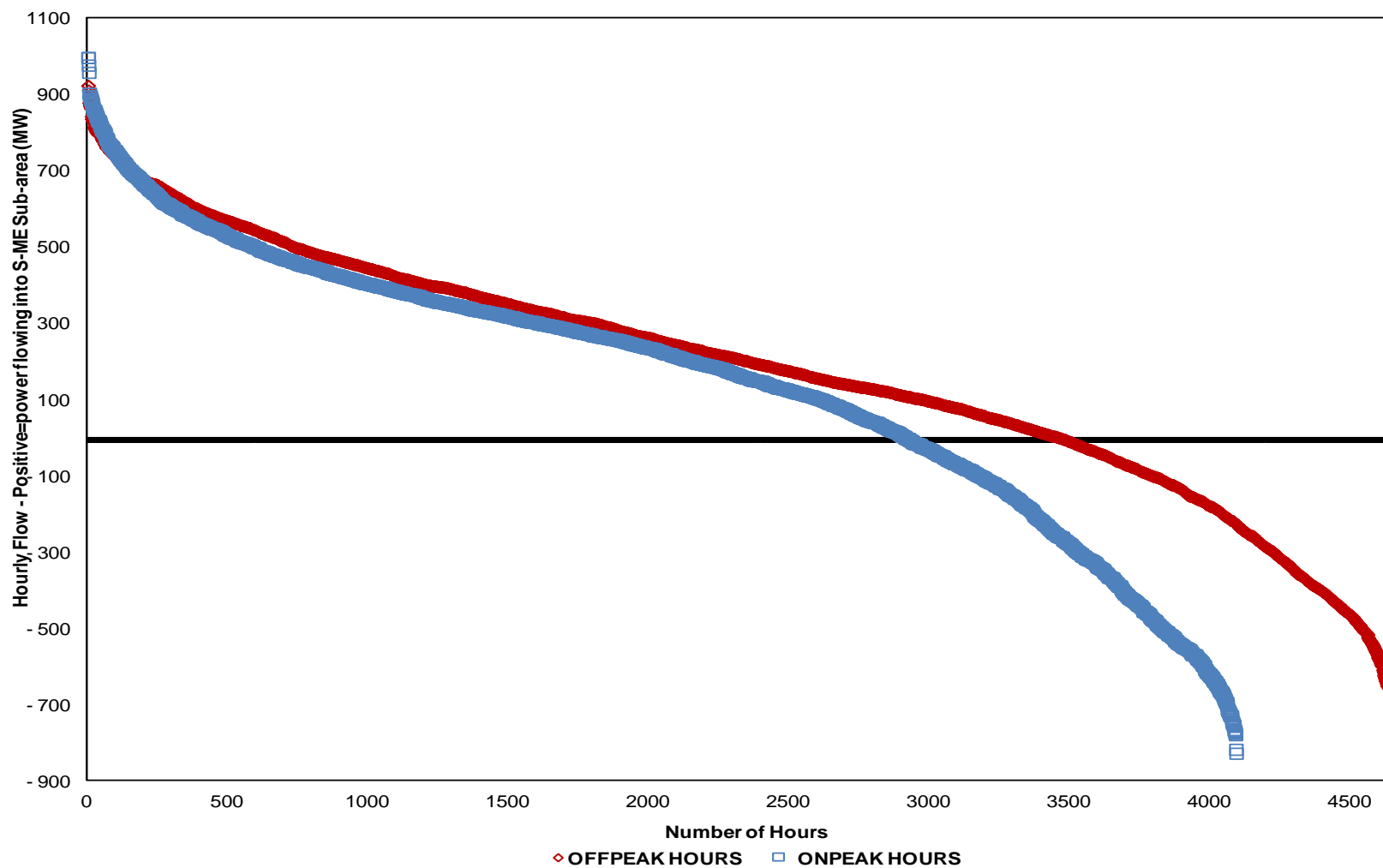
East-West Interface Duration Curve: Net Flow as % of Interface Limit
January - December 2011



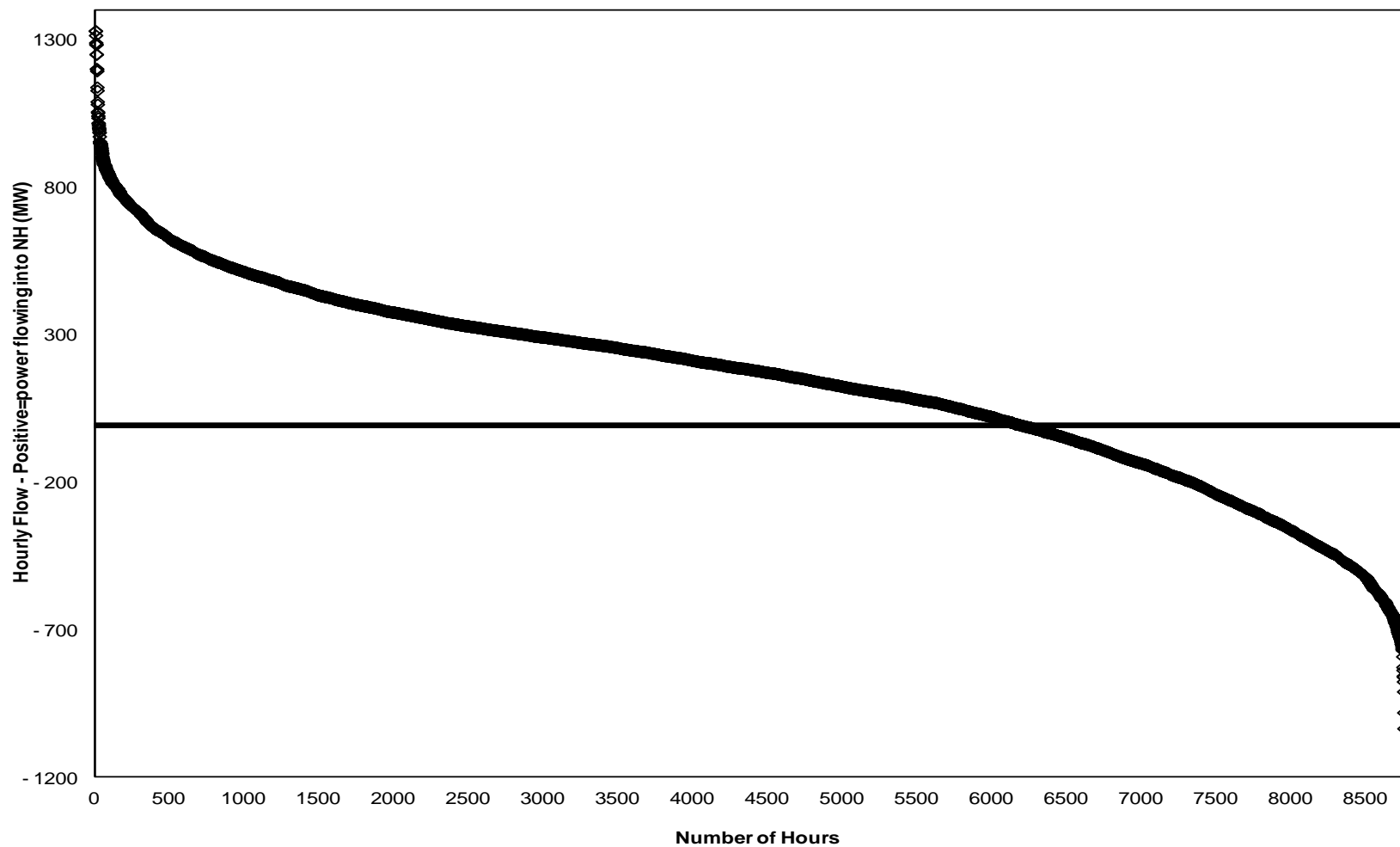
Surowiec South Interface Duration Curve: Net Flow MWs
January - December 2011



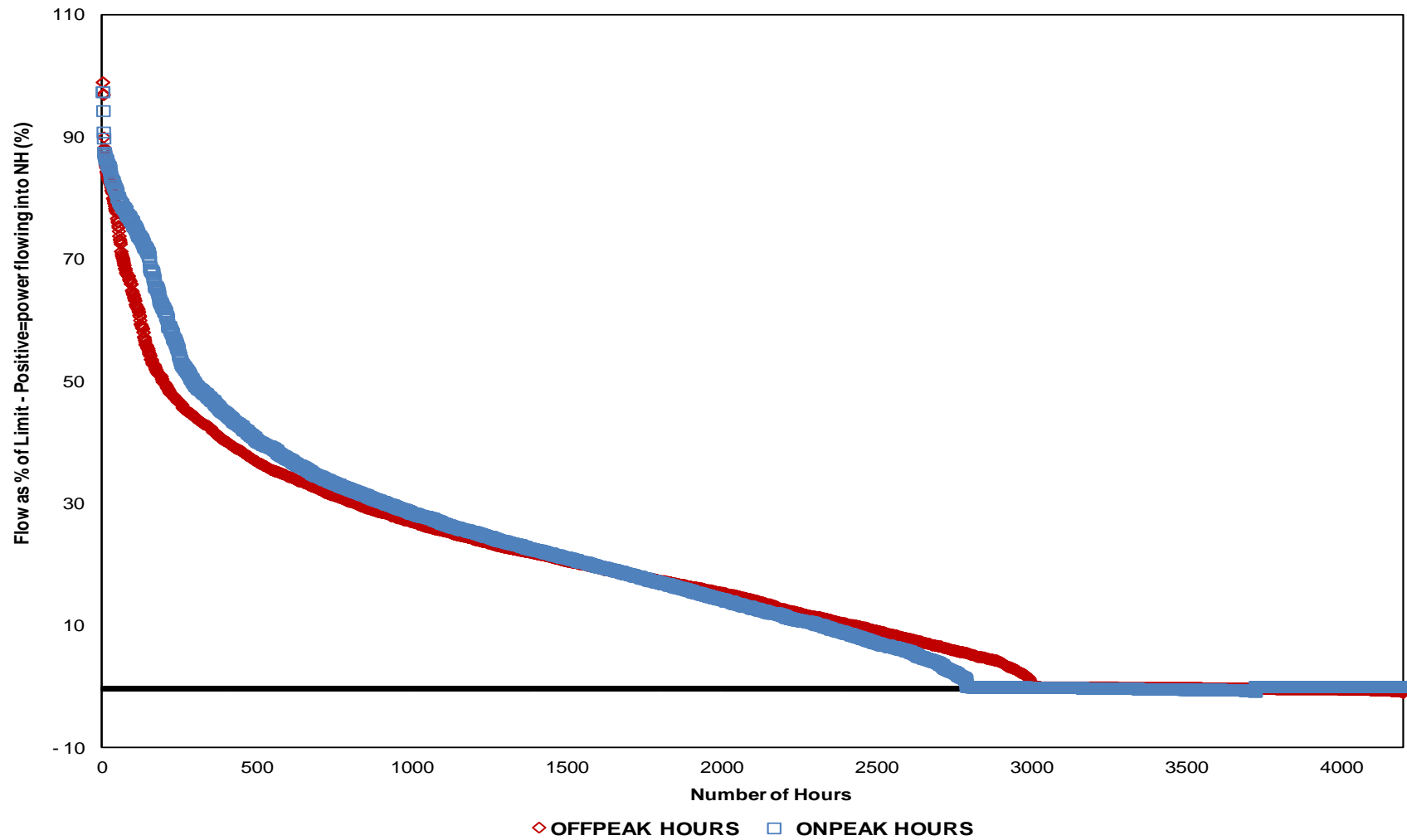
Surowiec South Interface Duration Curve: Net Flow MWs
January - December 2011



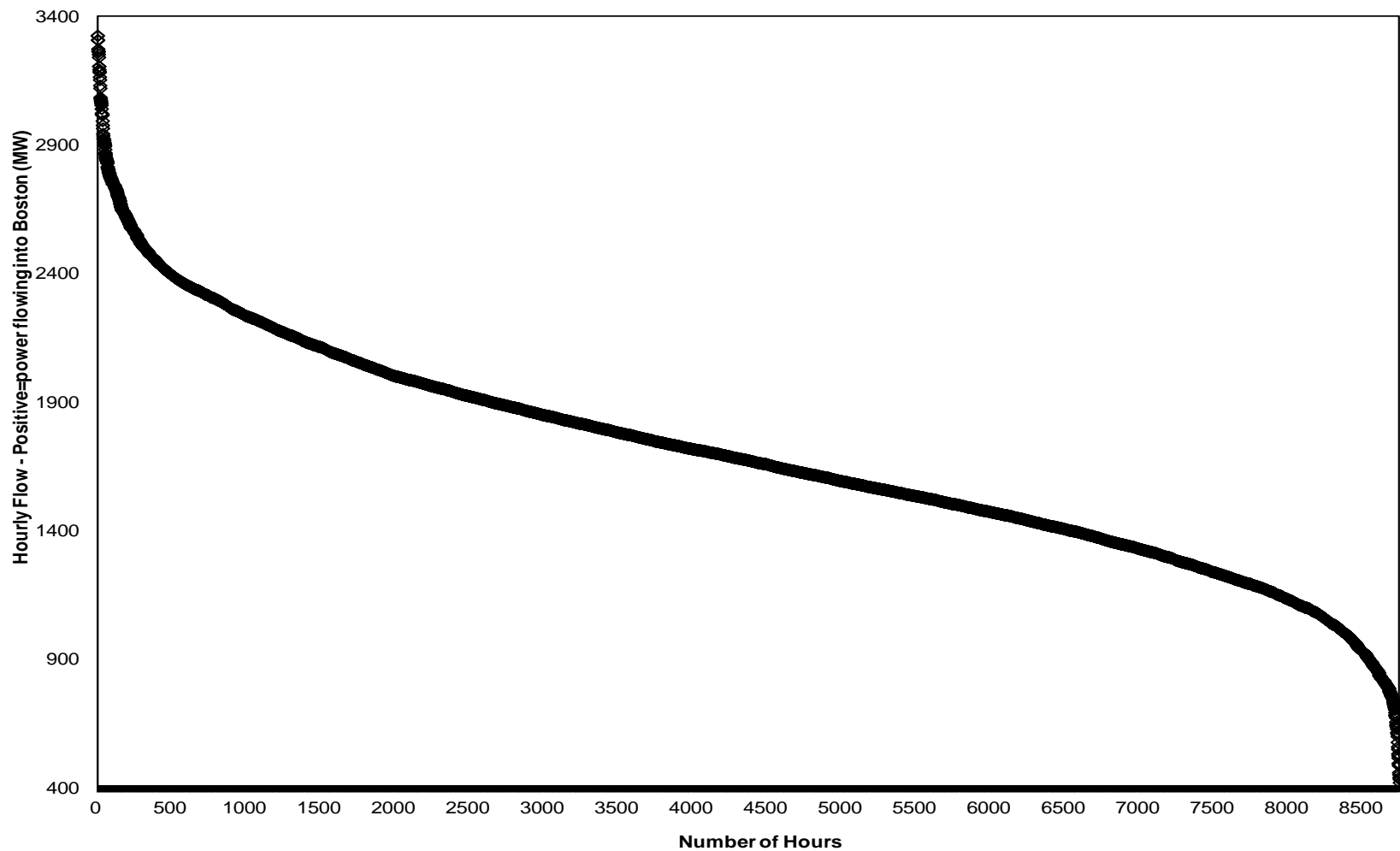
Maine-New Hampshire Interface Duration Curve: Net Flow MWs
January - December 2011



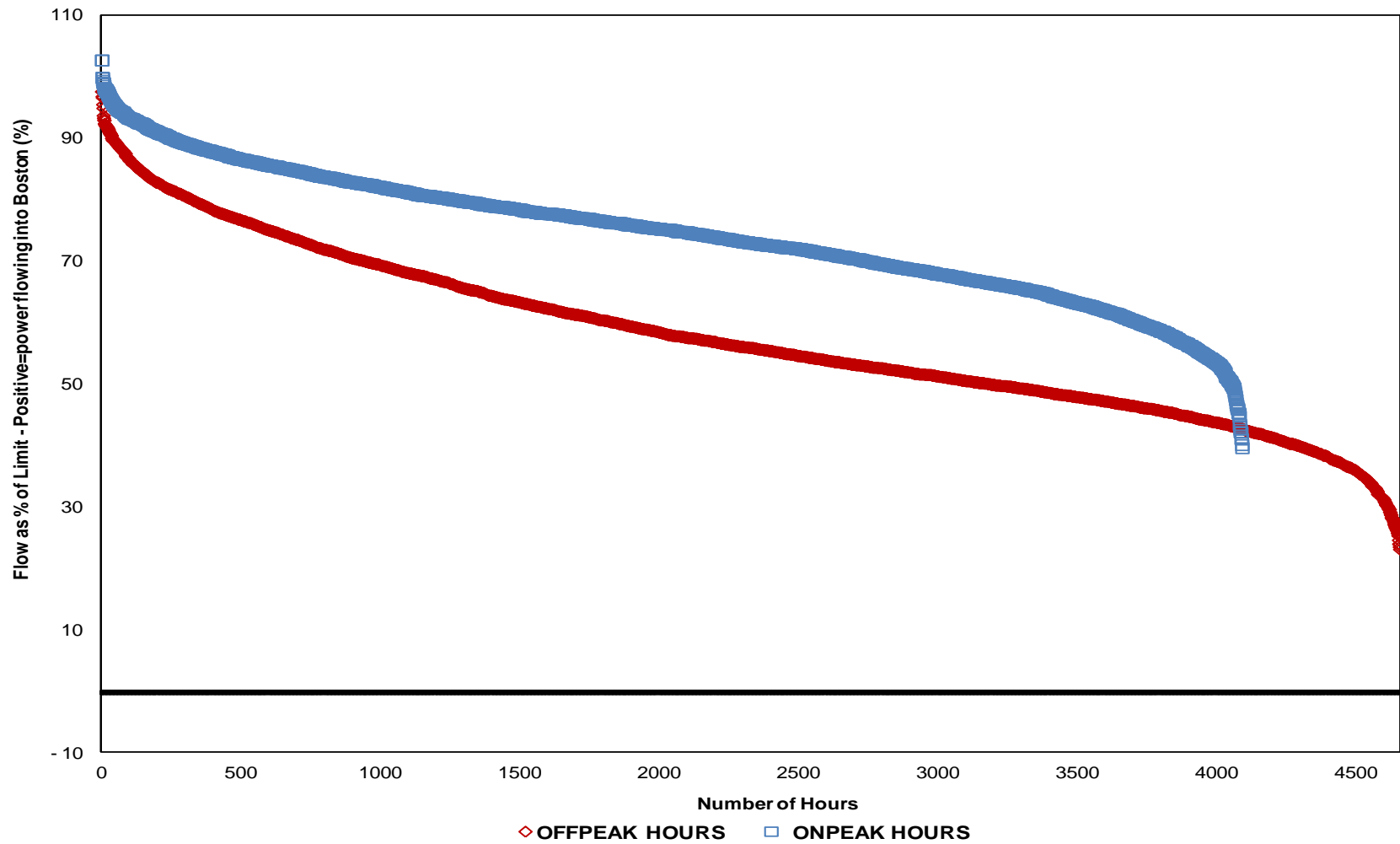
Maine-New Hampshire Interface Duration Curve: Net Flow as % of Interface Limit
January - December 2011



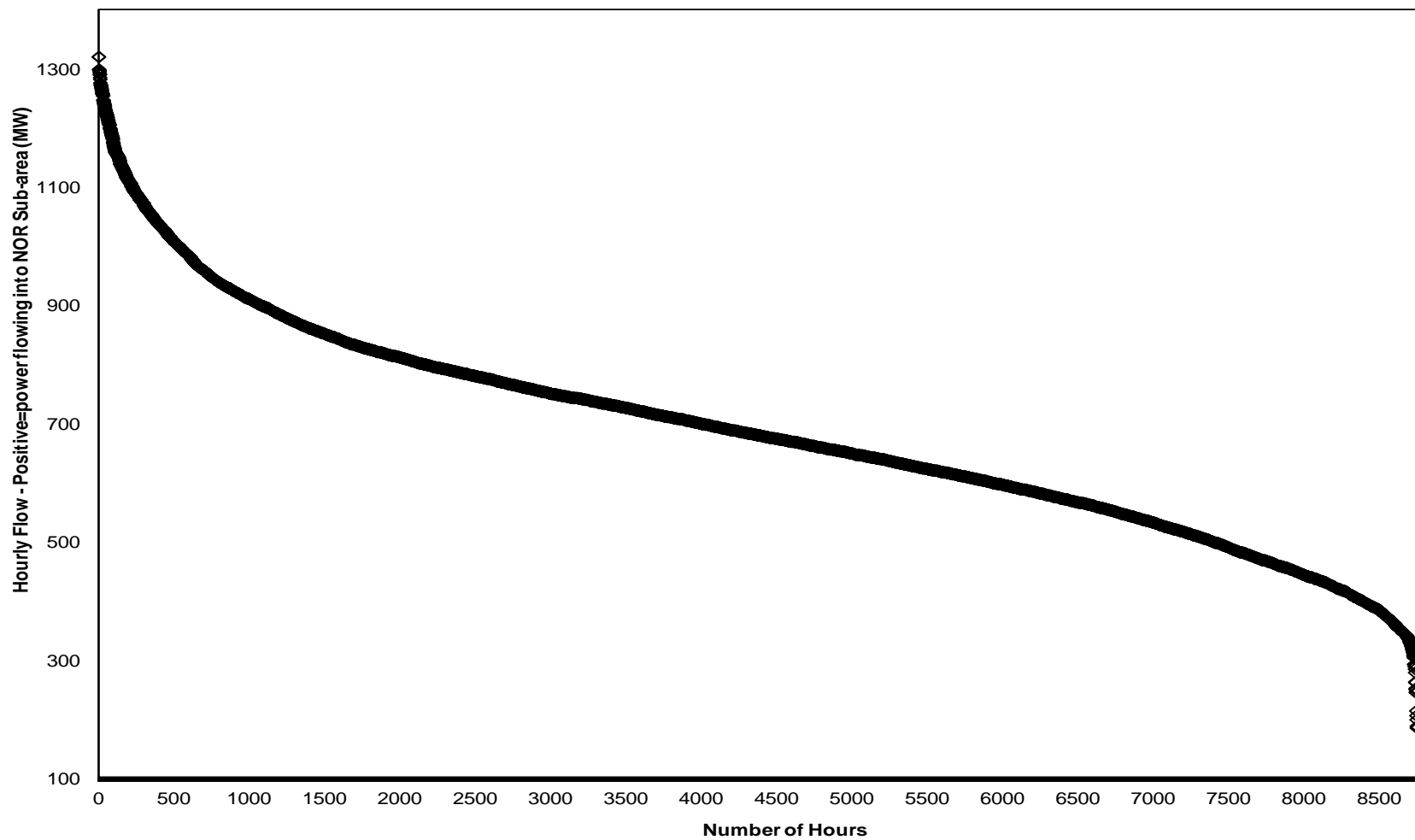
Boston Import Interface Duration Curve: Net Flow MWs
January - December 2011



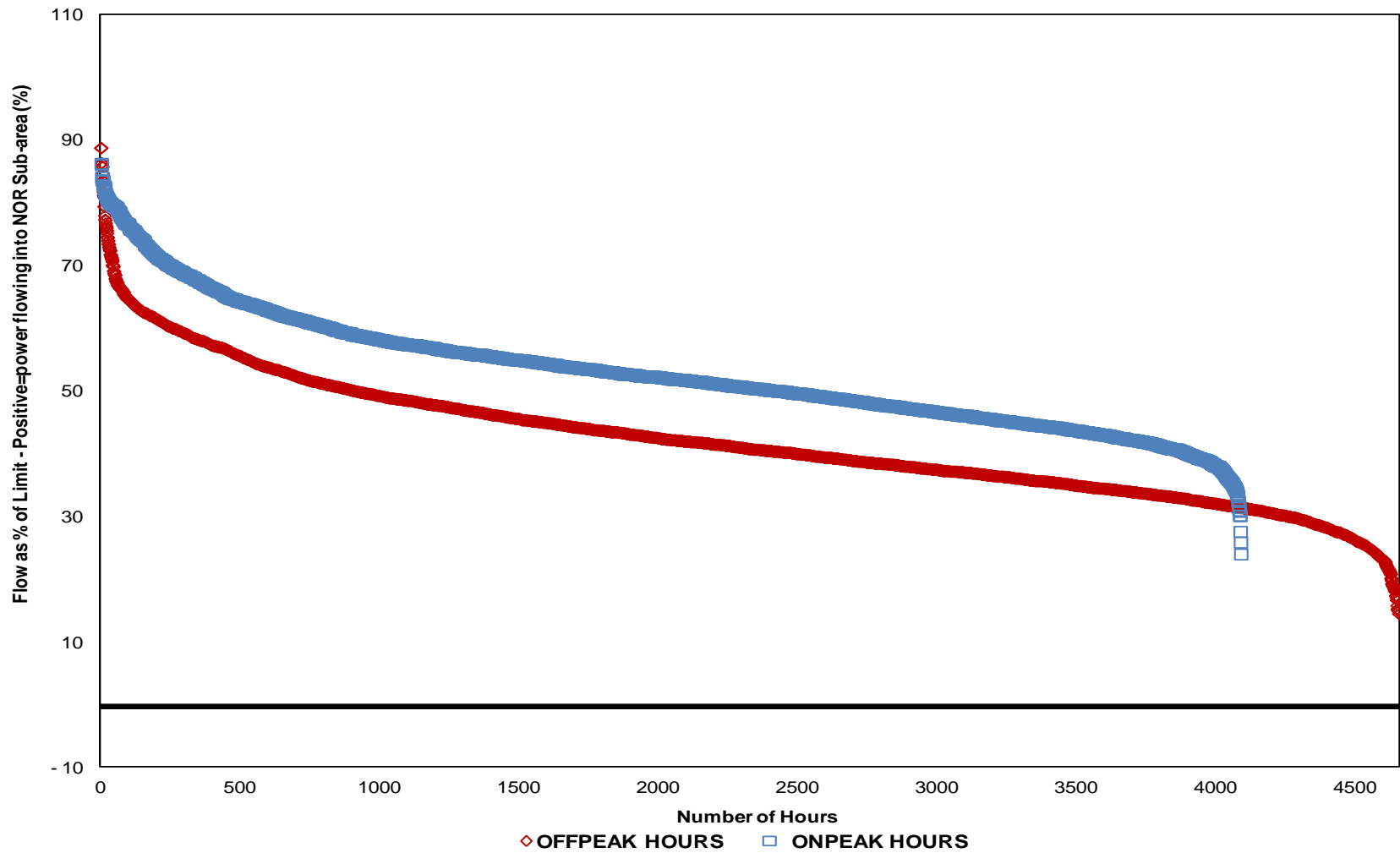
**Boston Import Interface Duration Curve: Net Flow as % of Interface Limit
January - December 2011**



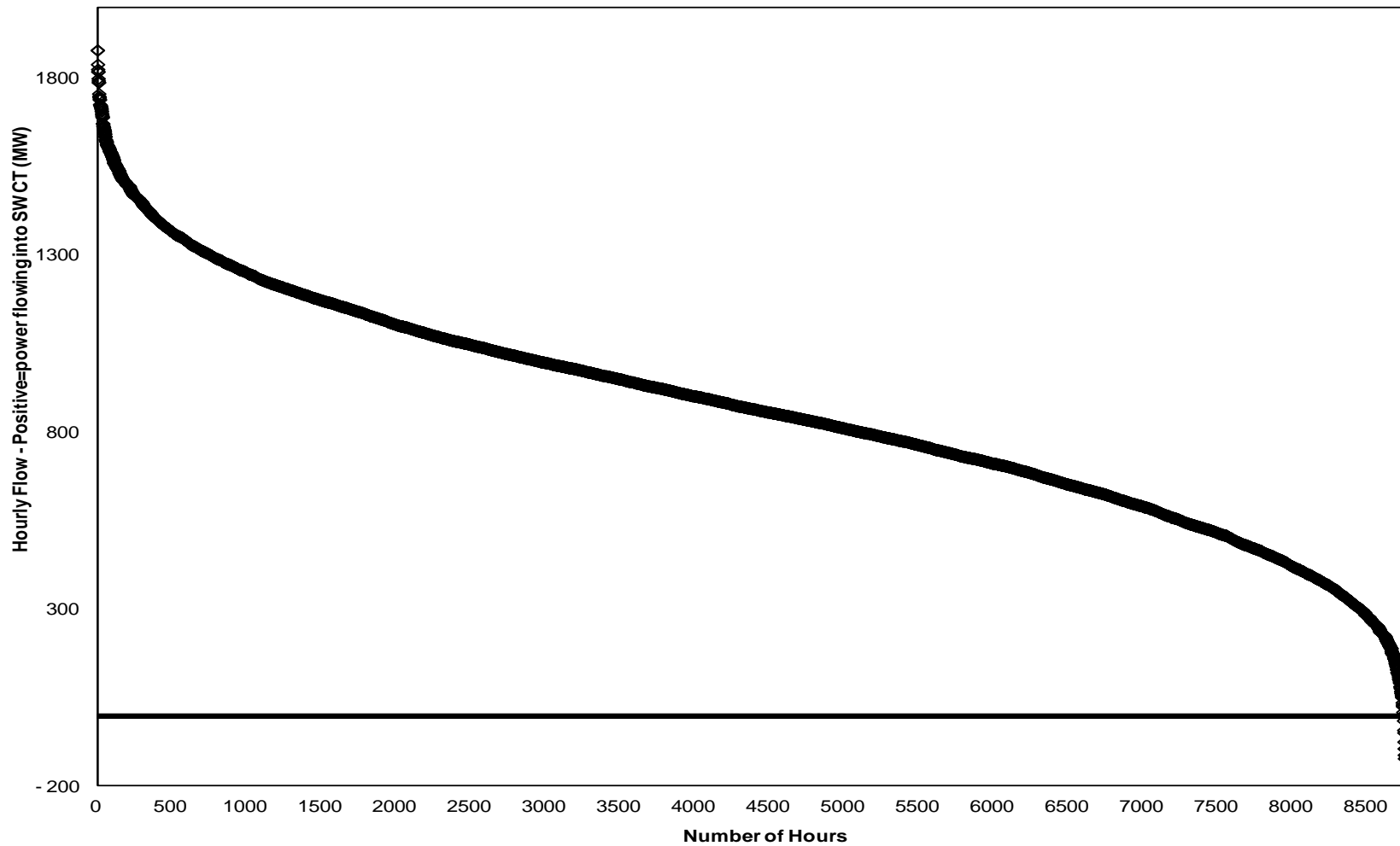
Norwalk-Stamford Interface Duration Curve: Net Flow MWs
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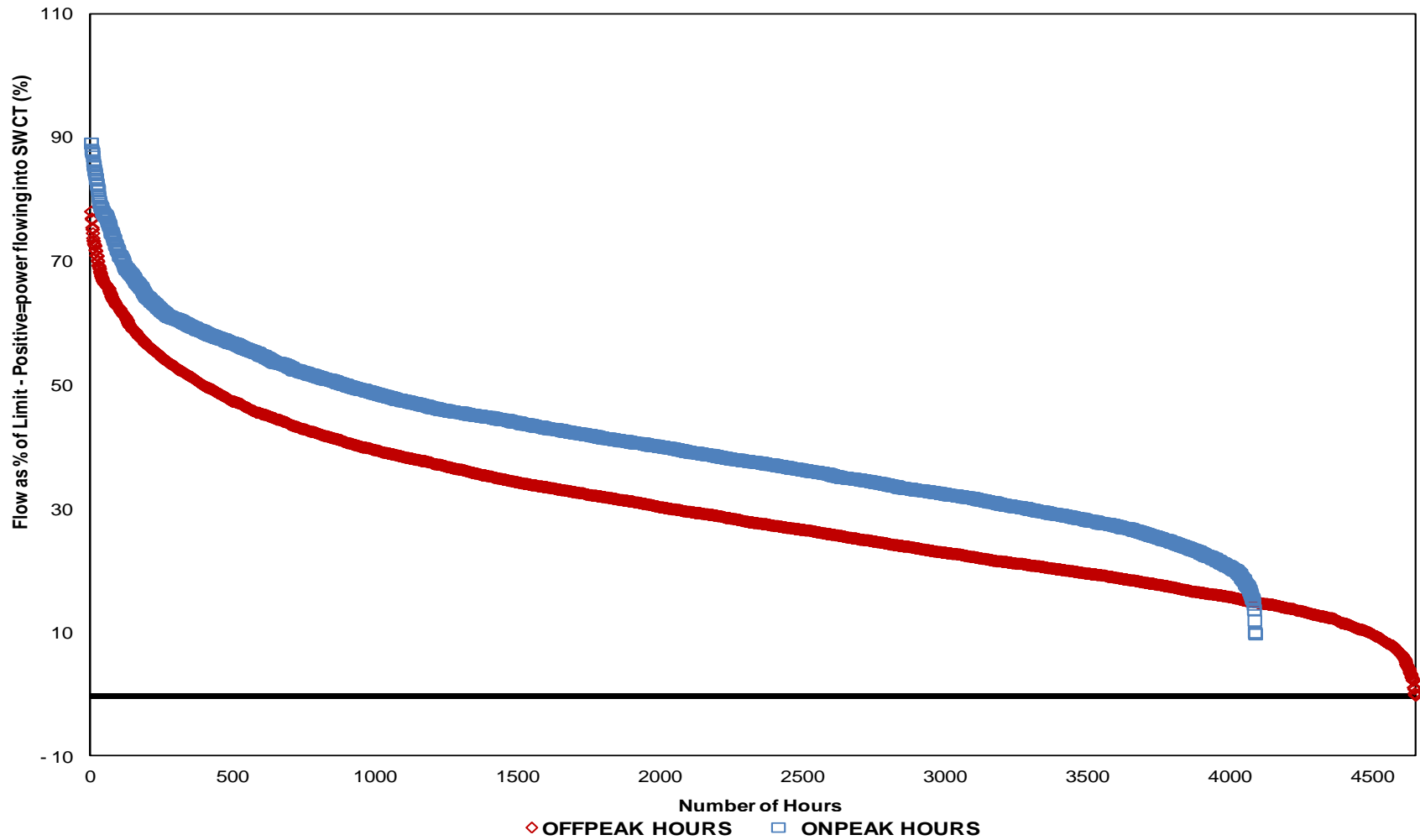
Norwalk-Stamford Interface Duration Curve: Net Flow as % of Interface Limit
January - December 2011



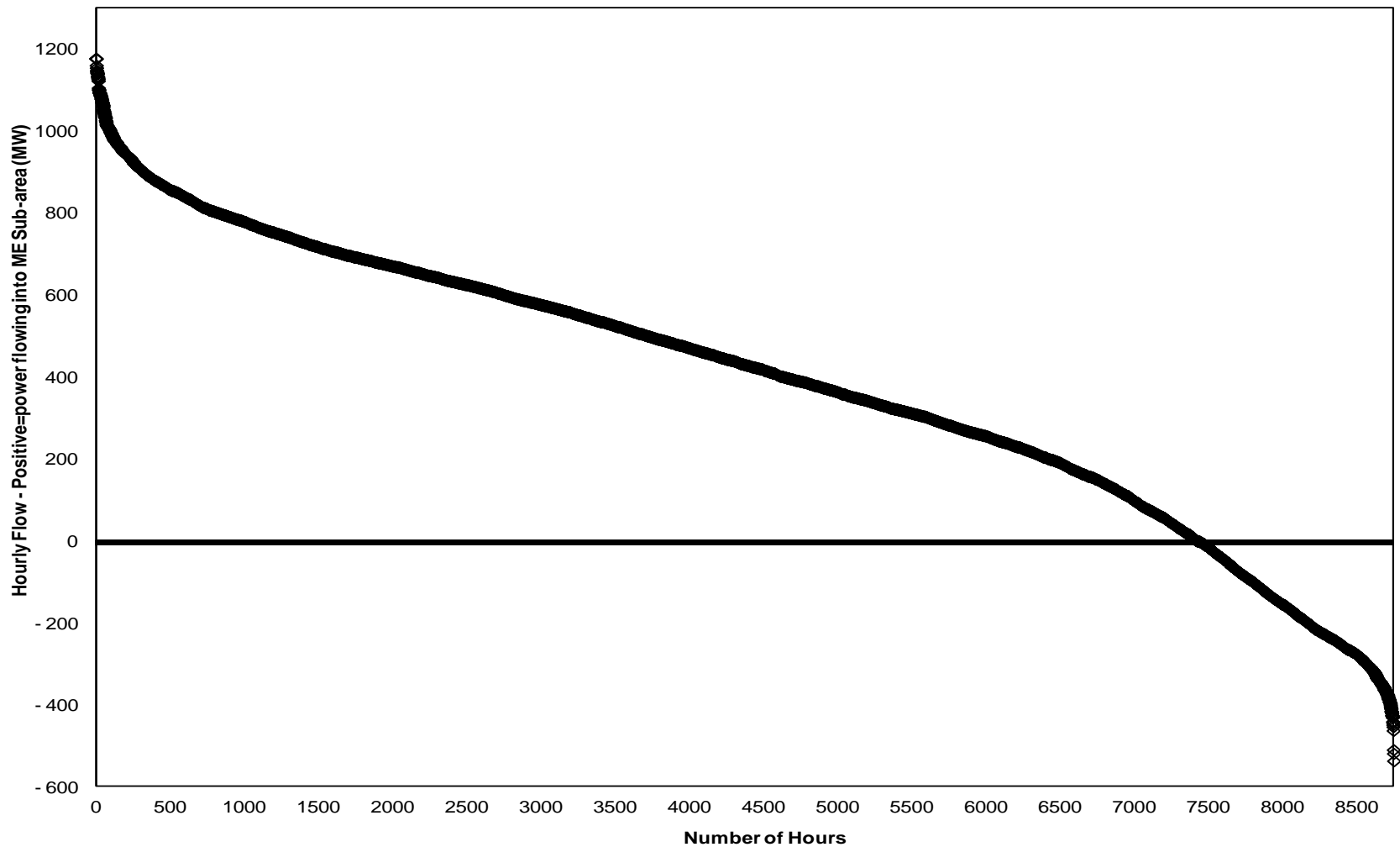
Southwest CT Import Interface Duration Curve: Net Flow MWs
January - December 2011



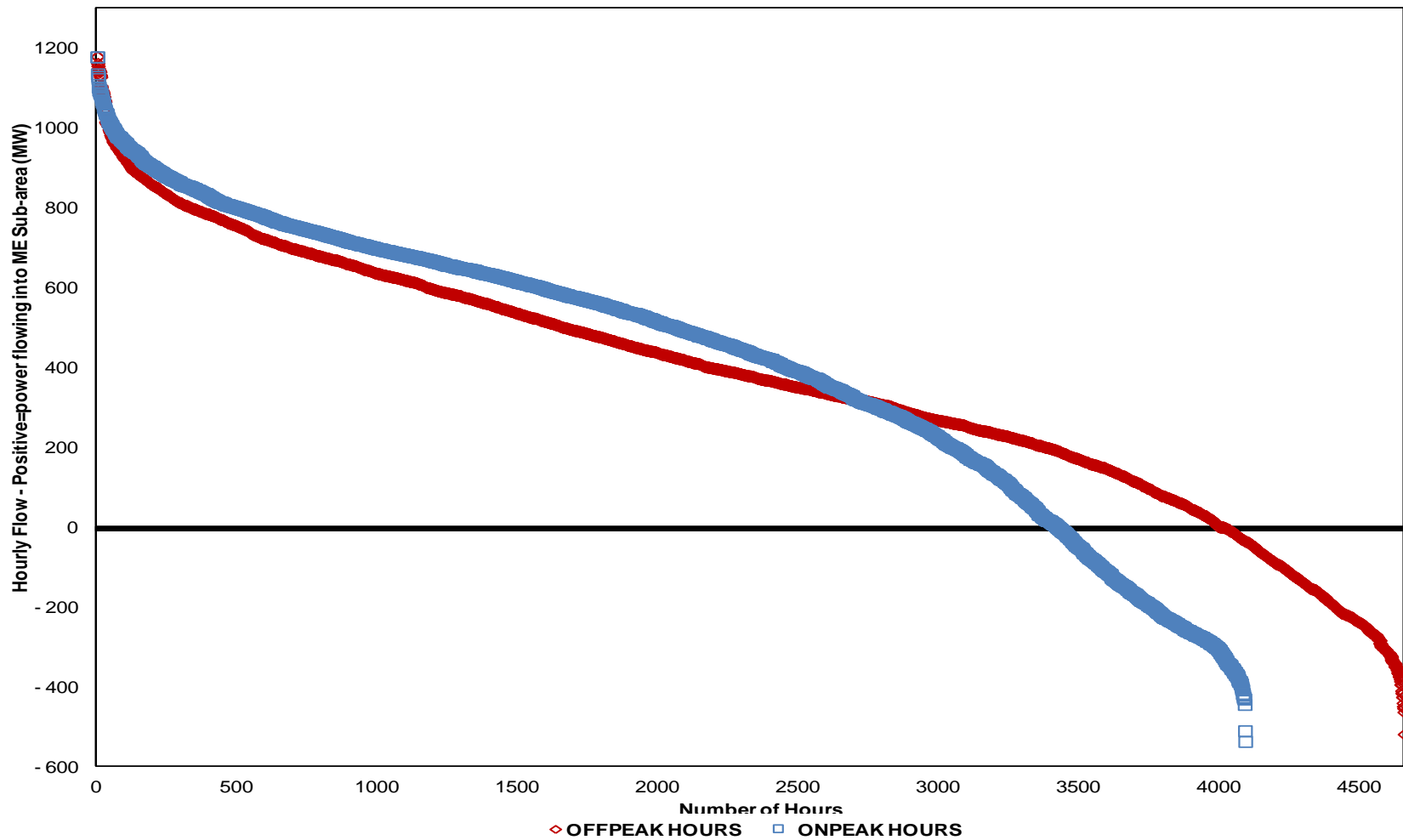
Southwest CT Import Interface Duration Curve: Net Flow as % of Interface Limit
January - December 2011



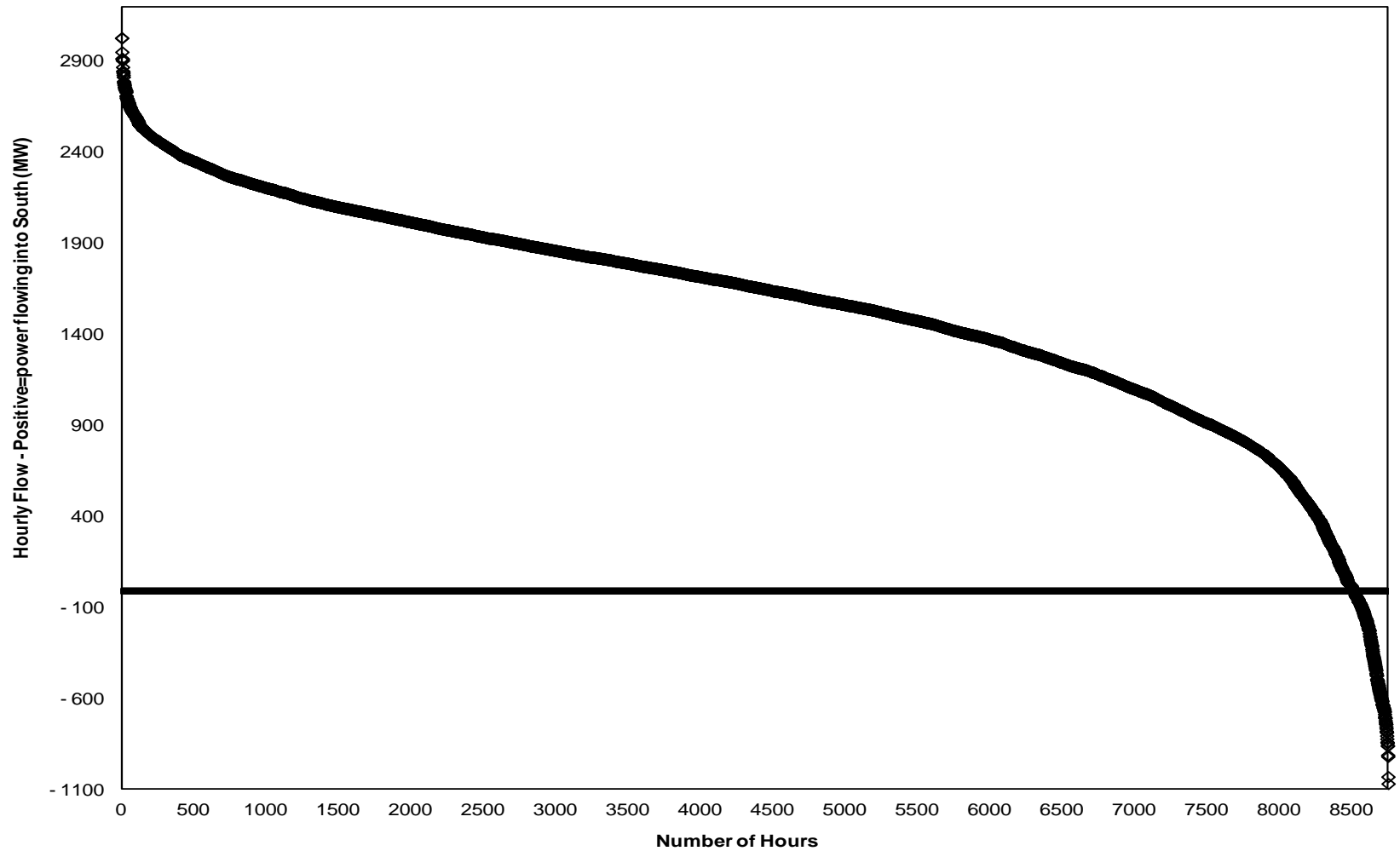
Orrington South Interface Duration Curve: Net Flow MWs
January - December 2011



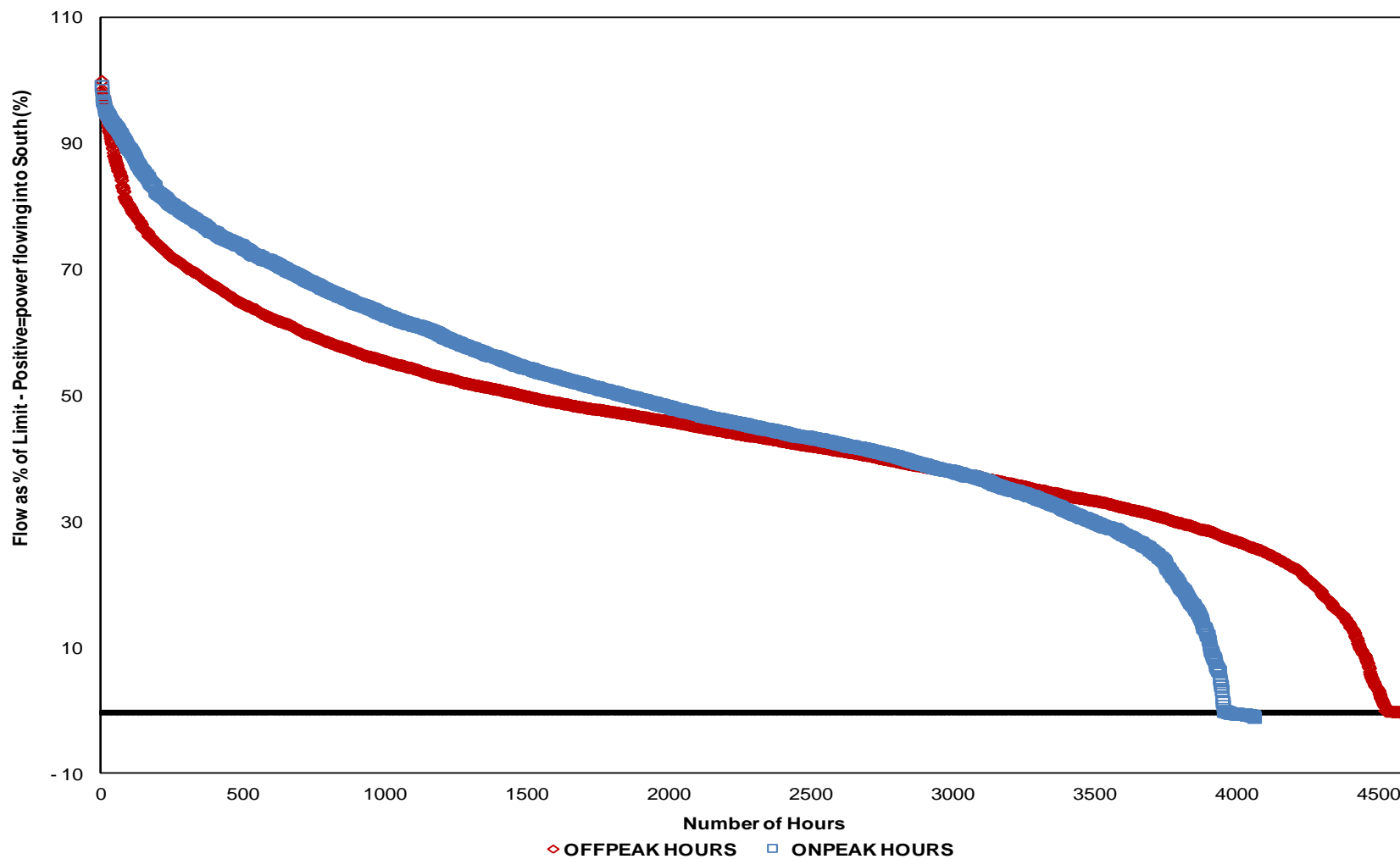
Orrington South Interface Duration Curve: Net Flow MWs
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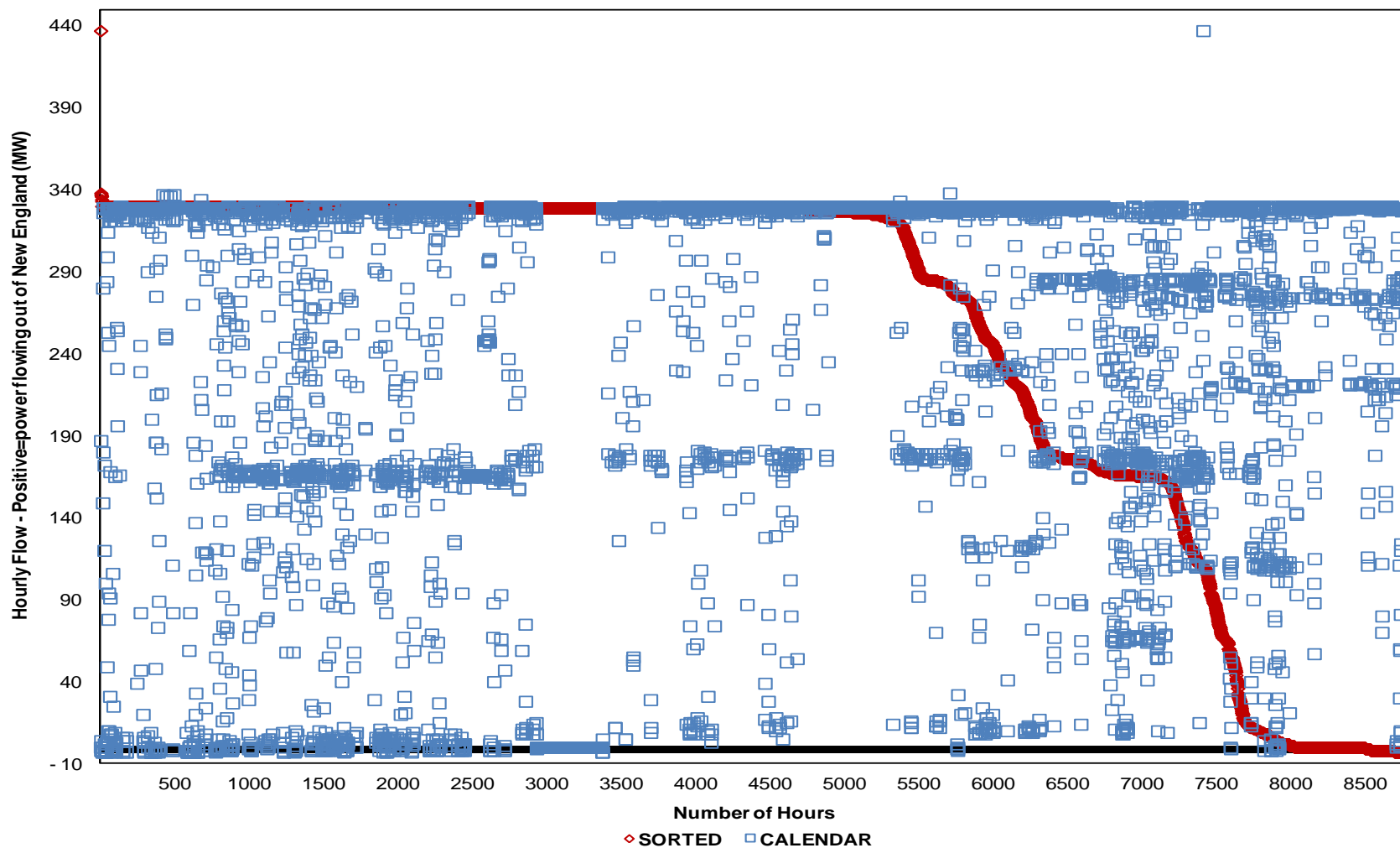
North-South Interface Duration Curve: Net Flow MWs
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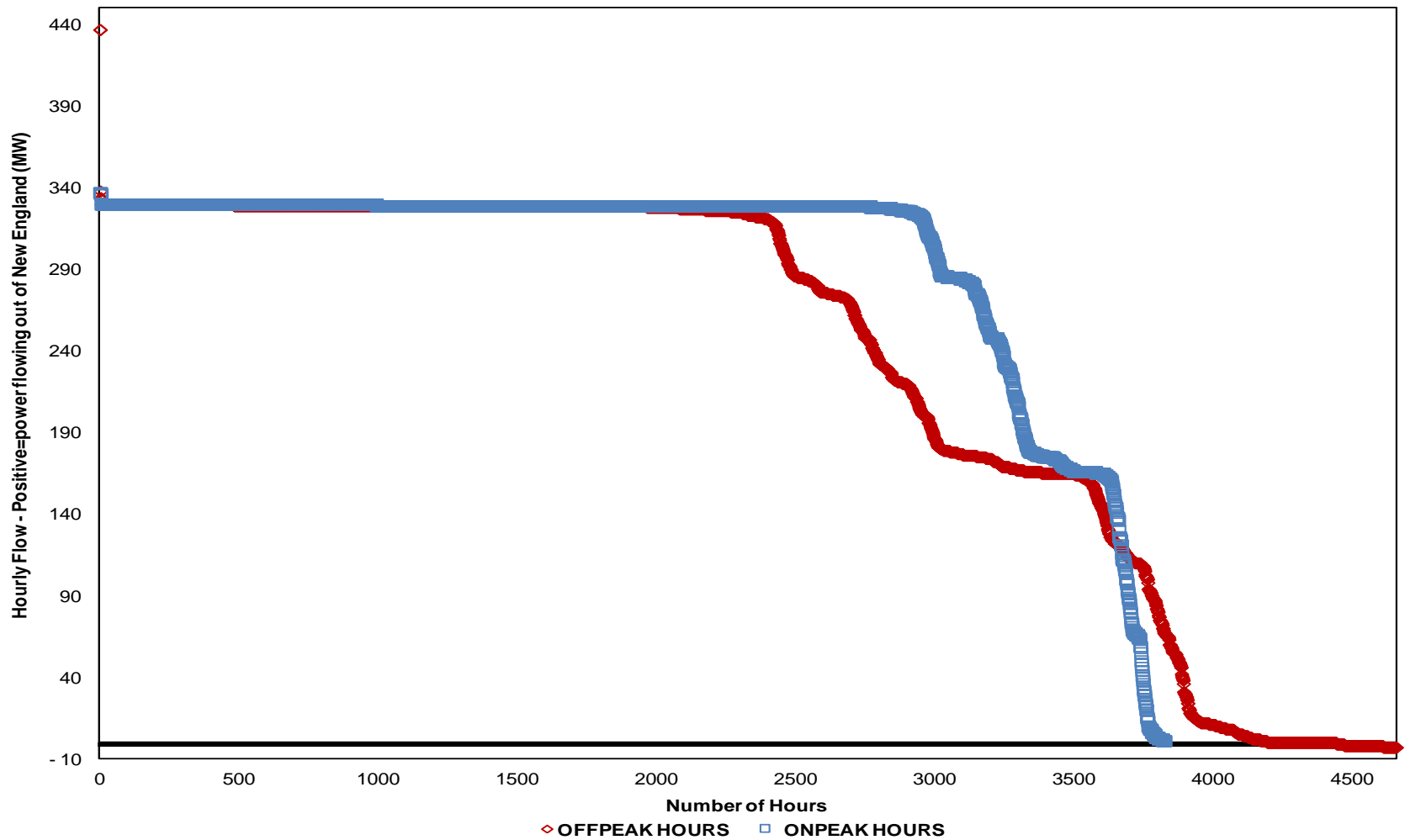
North-South Interface Duration Curve: Net Flow as % of Interface Limit
January - December 2011



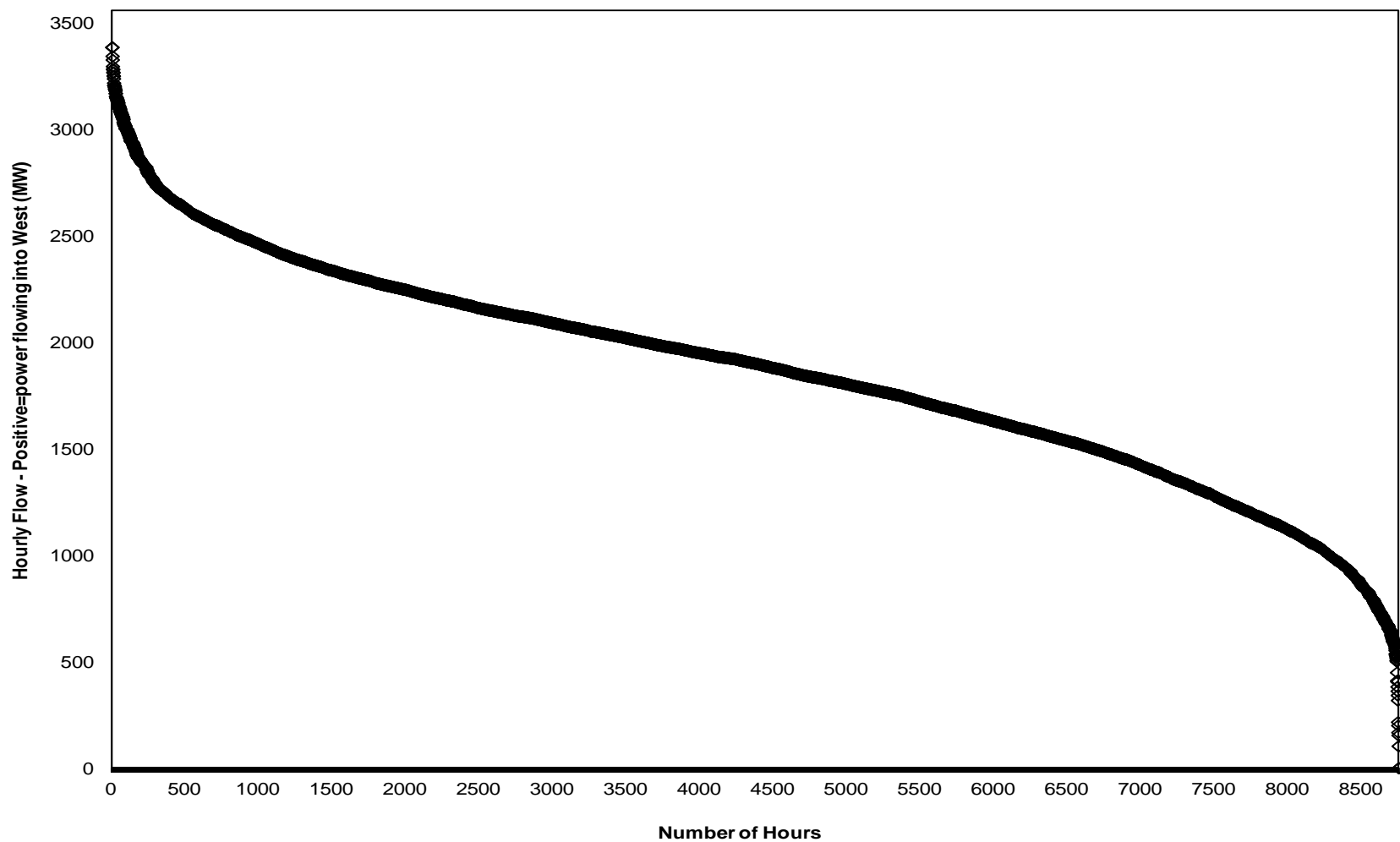
NE-NY Cross Sound Cable Interface Duration Curve: Net Flow MWs
January - December 2011



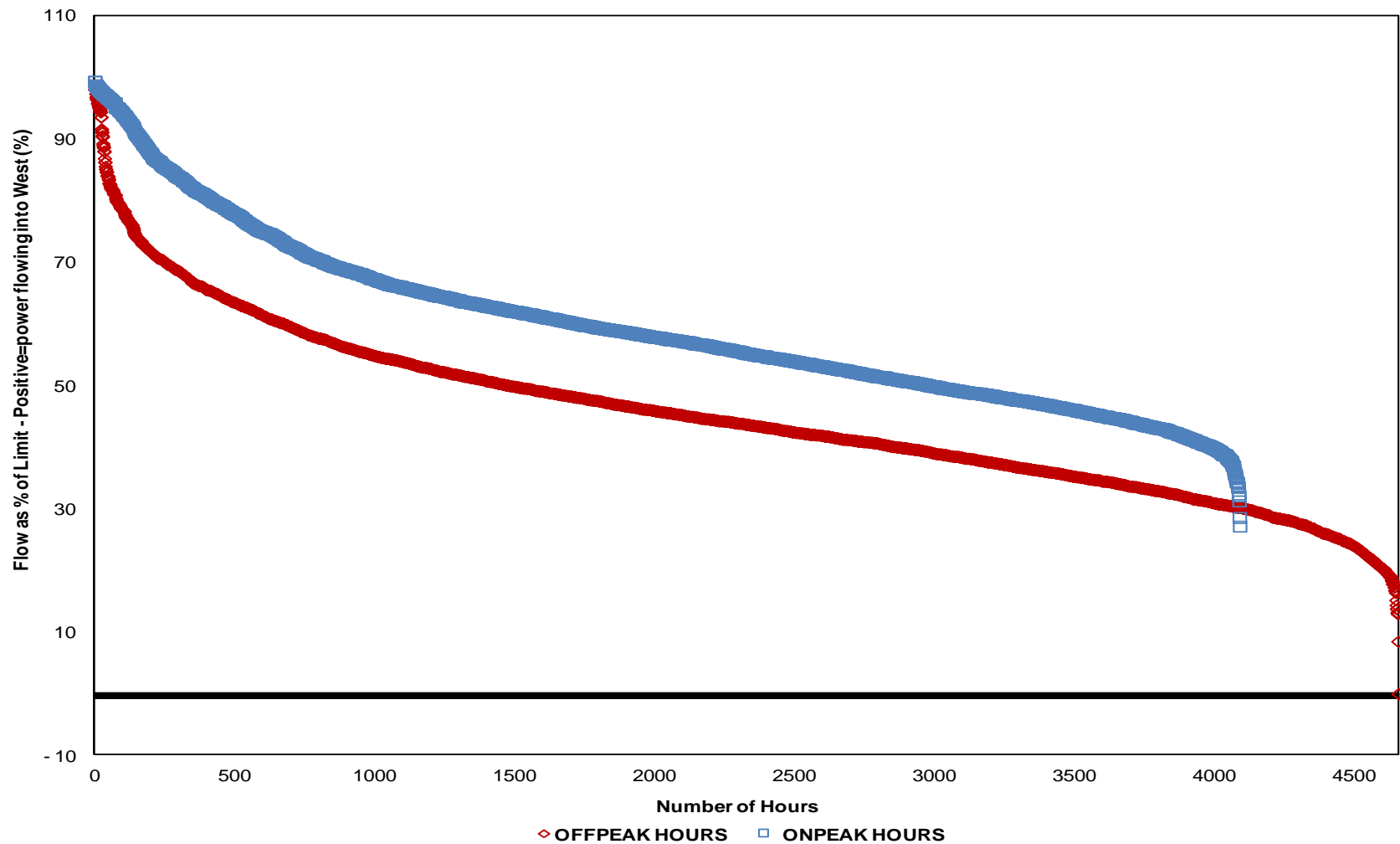
NE-NY Cross Sound Cable Interface Duration Curve: Net Flow MWs
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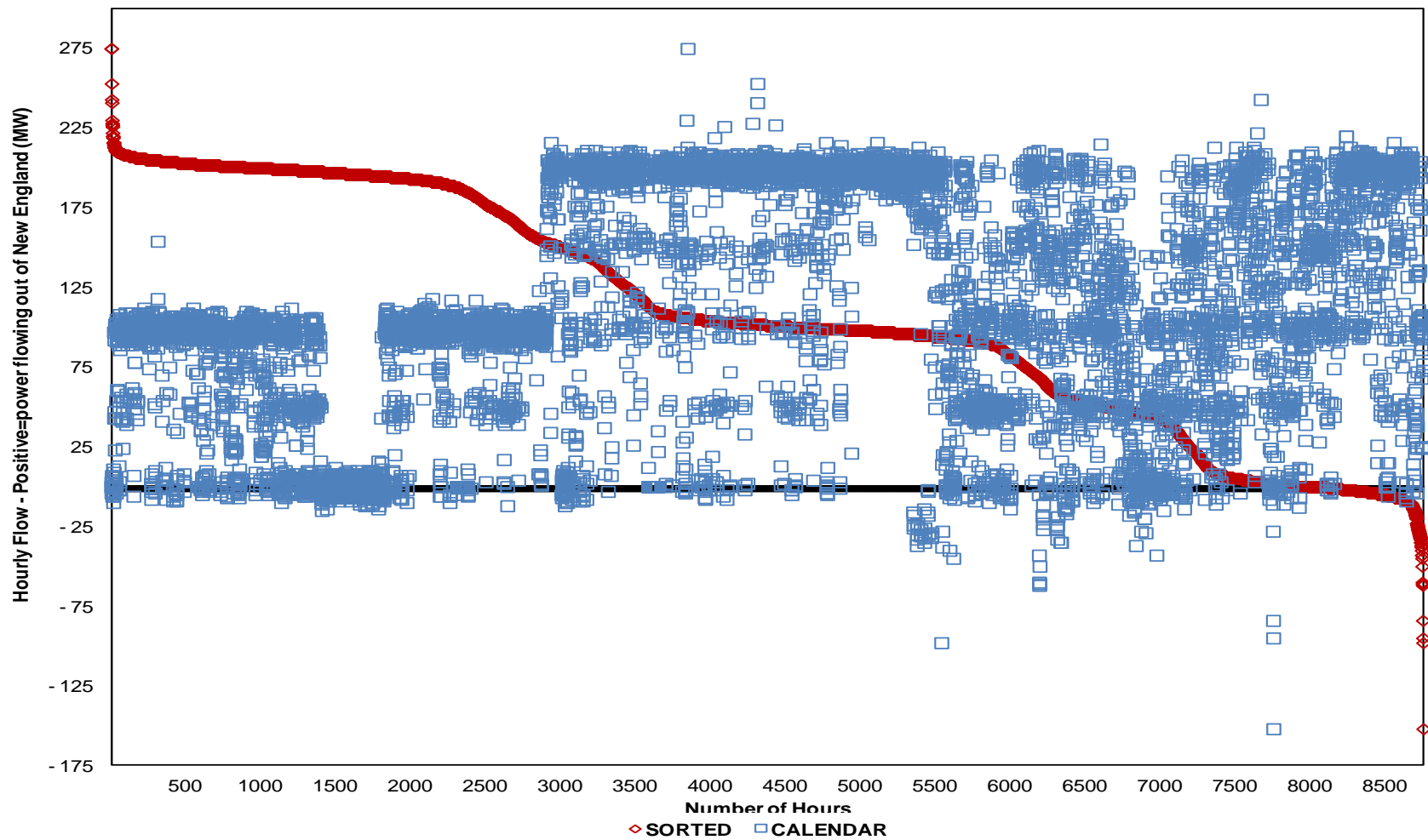
East to West CT Interface Duration Curve: Net Flow MWs
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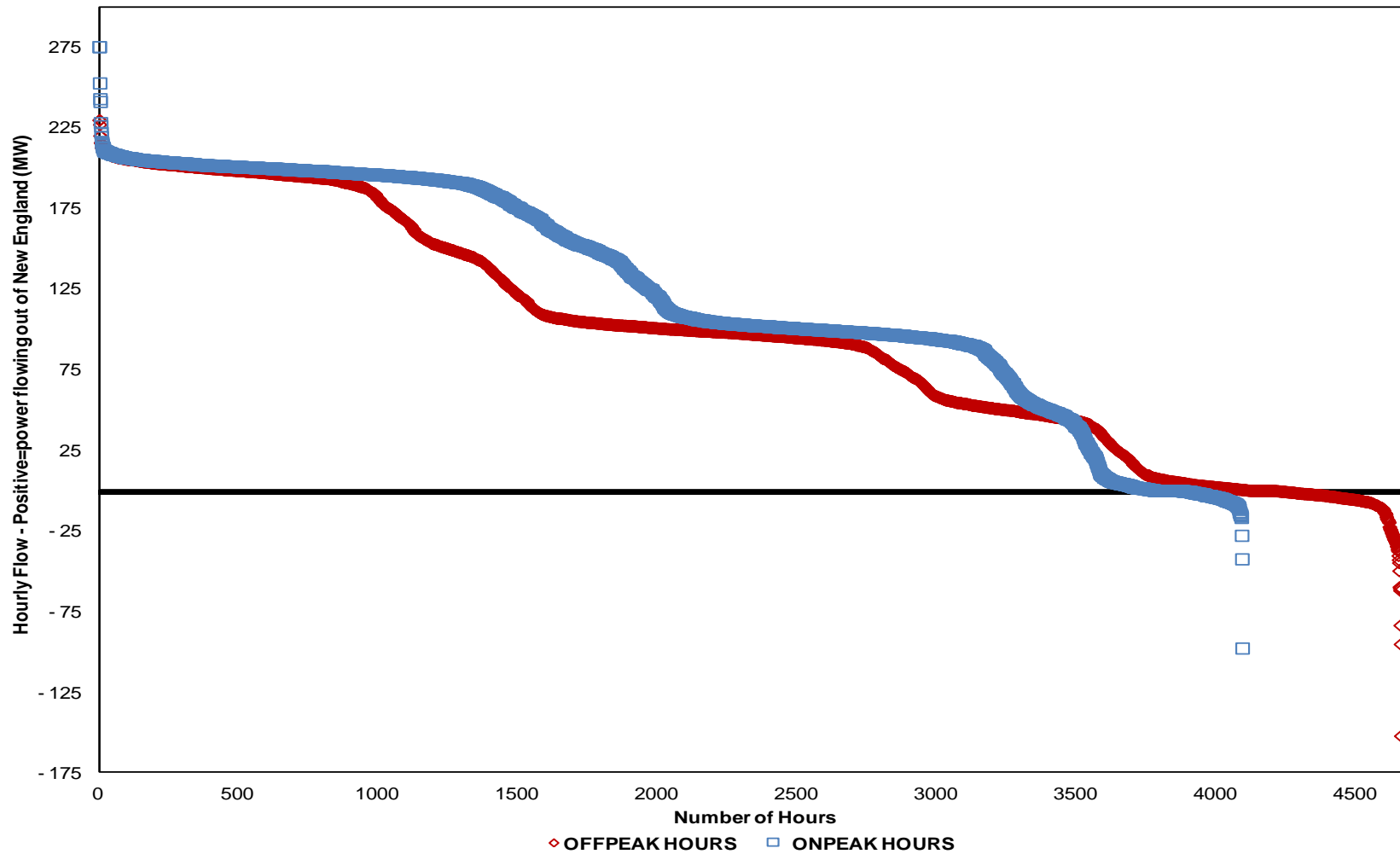
East to West CT Interface Duration Curve: Net Flow as % of Interface Limit
January - December 2011



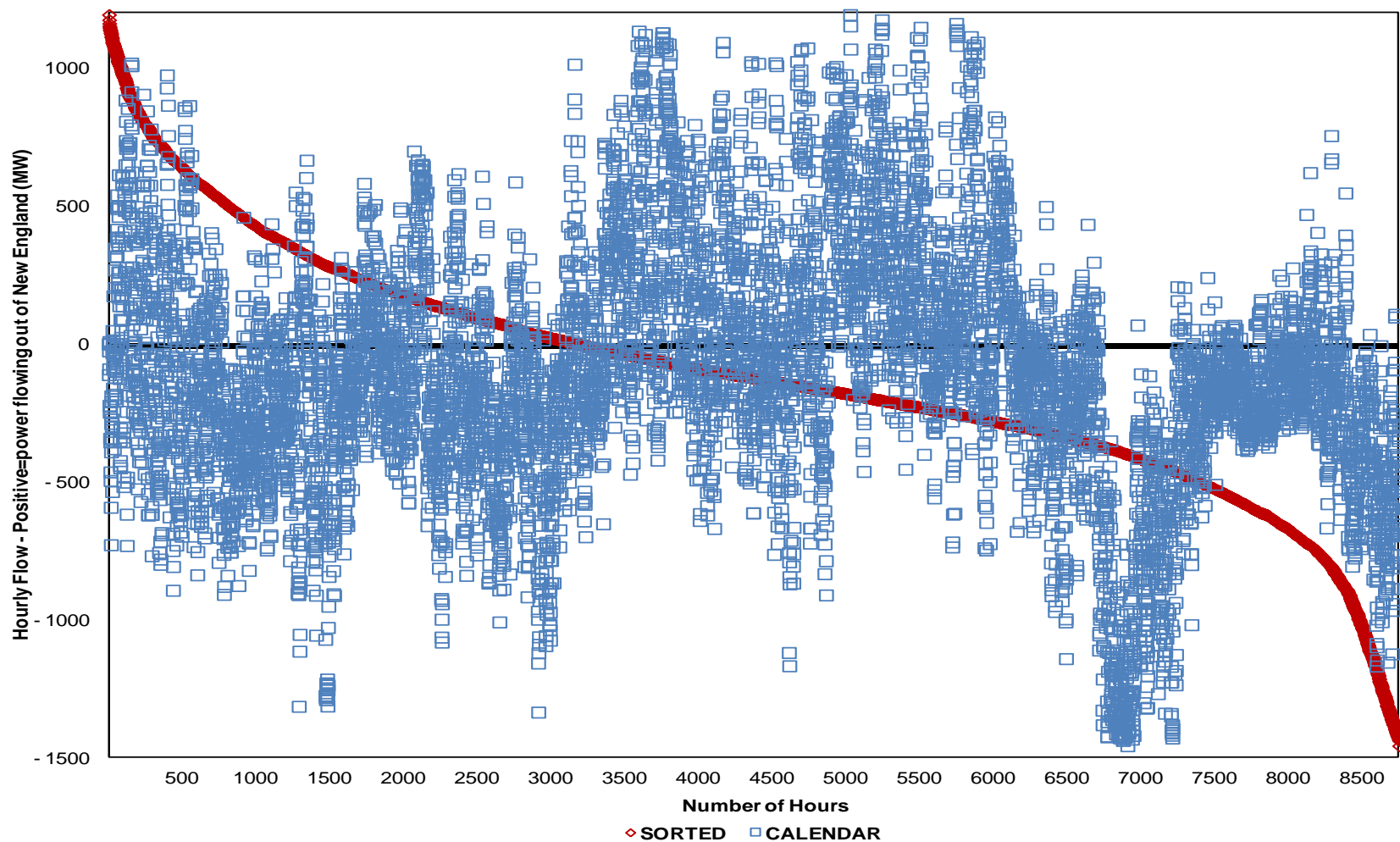
NE-NY Northport Interface Duration Curve: Net Flow MWs
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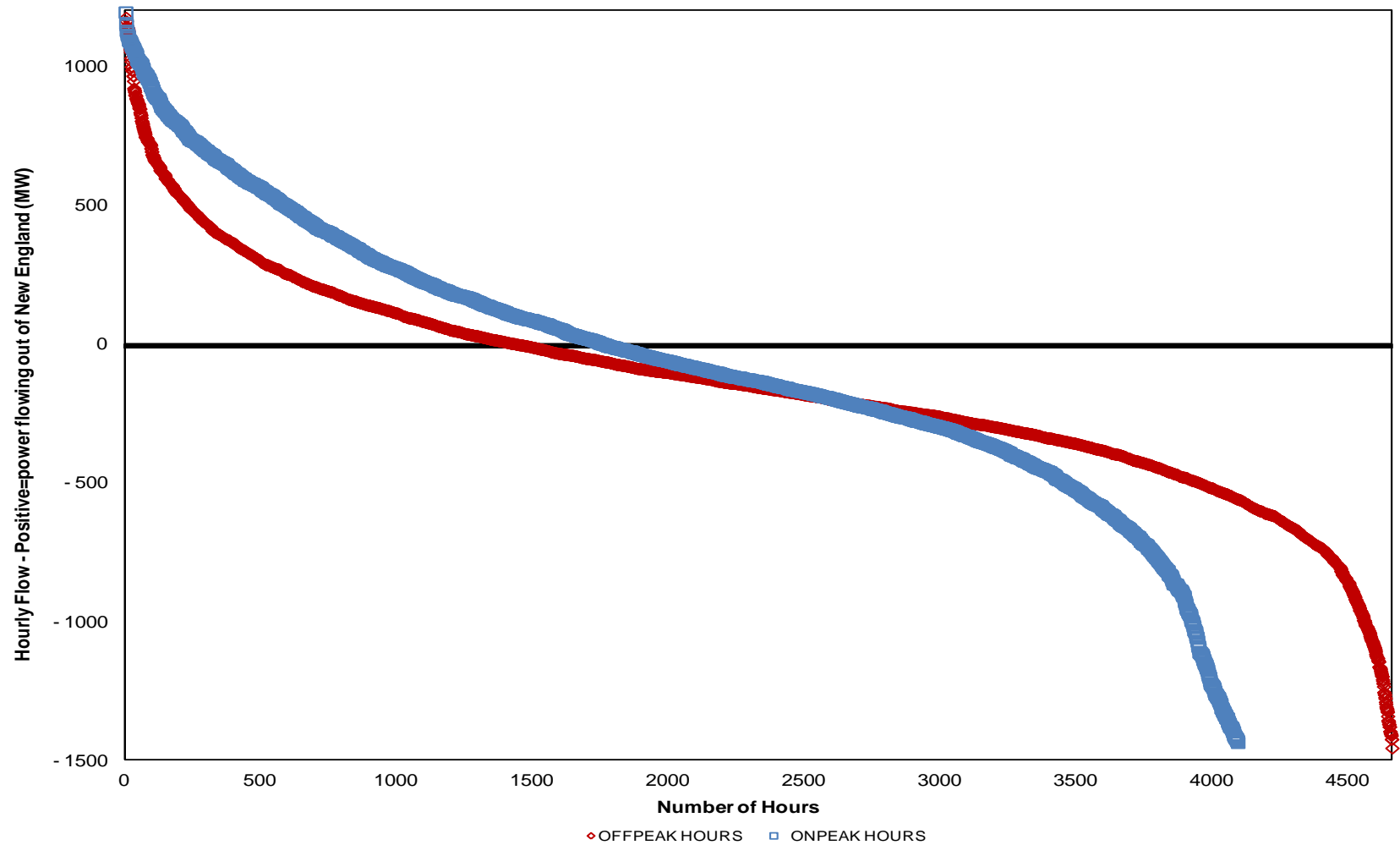
NE-NY Northport Interface Duration Curve: Net Flow MWs
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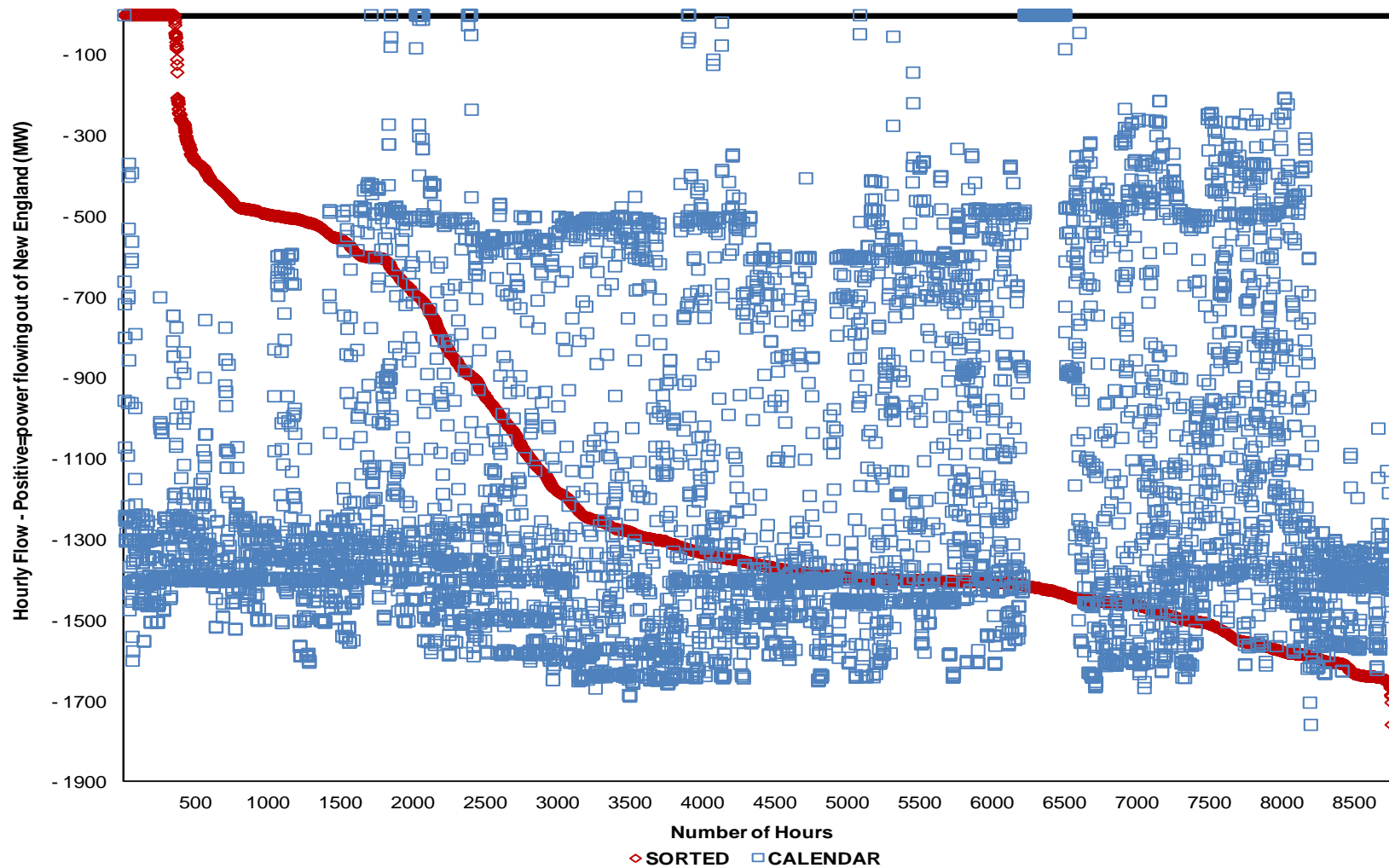
NE-NY Rest of AC Interface Duration Curve: Net Flow MWs
January - December 2011



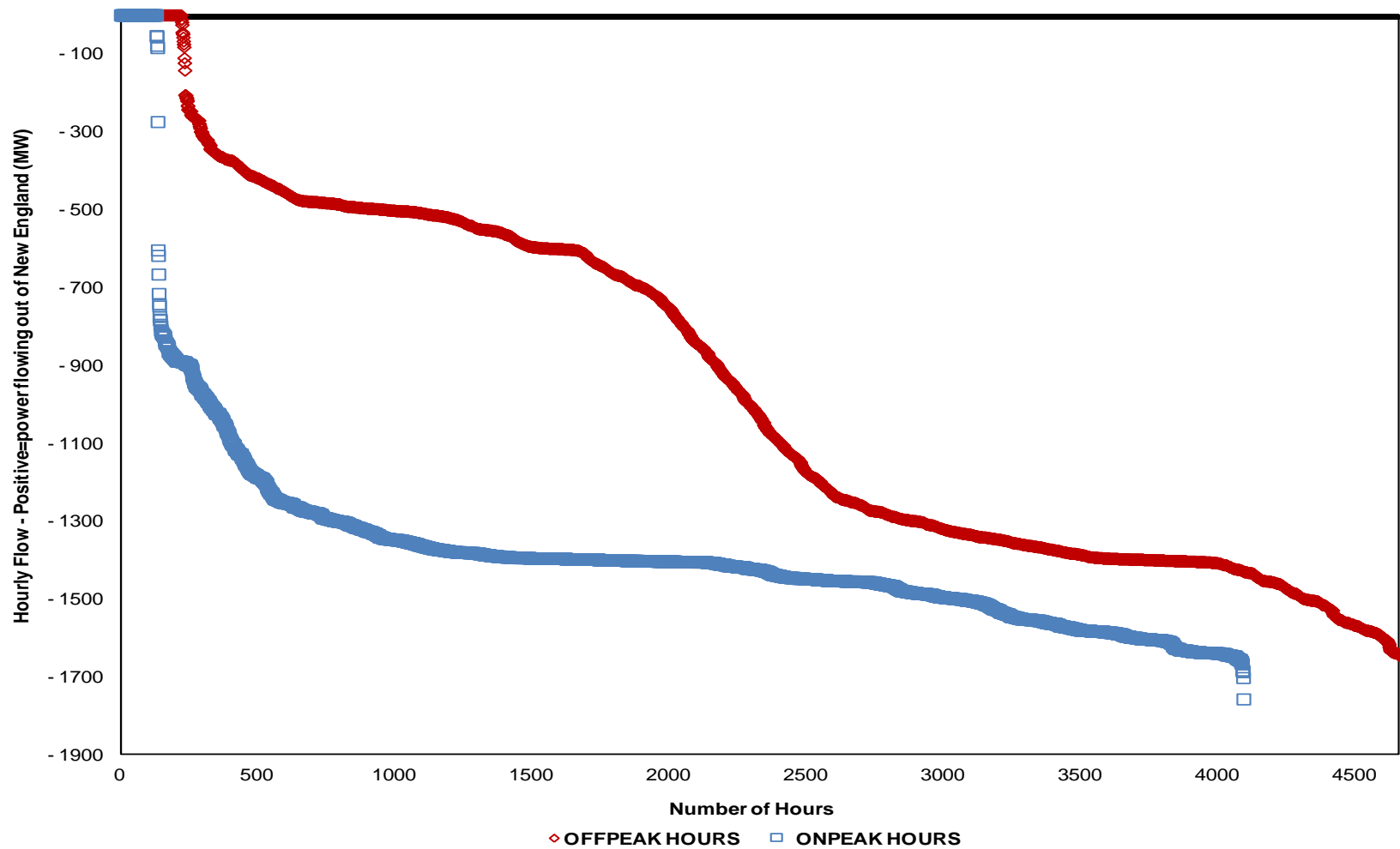
NE-NY Rest of AC Interface Duration Curve: Net Flow MWs
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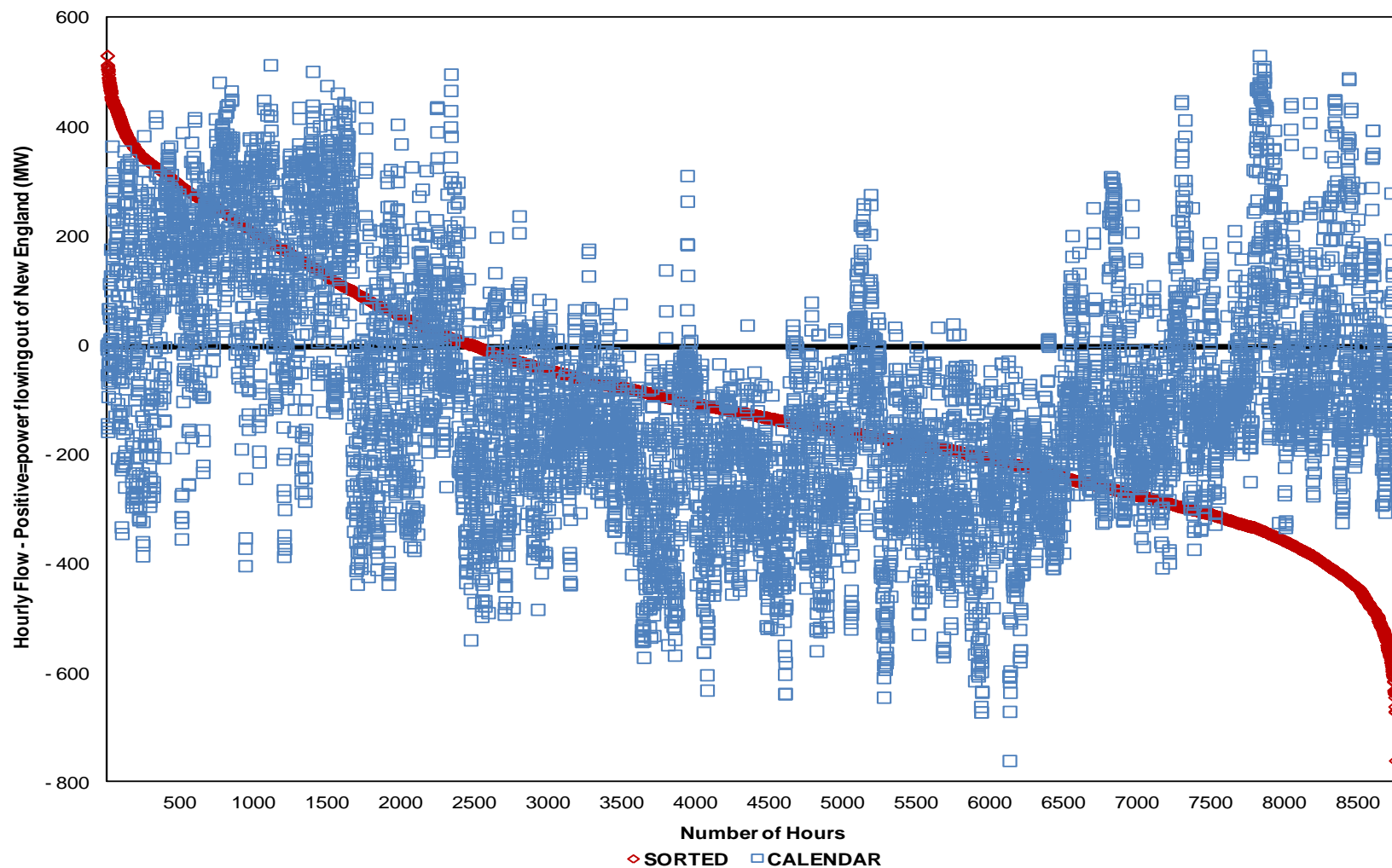
HQ Phase II Interface Duration Curve: Net Flow MWs
January - December 2011



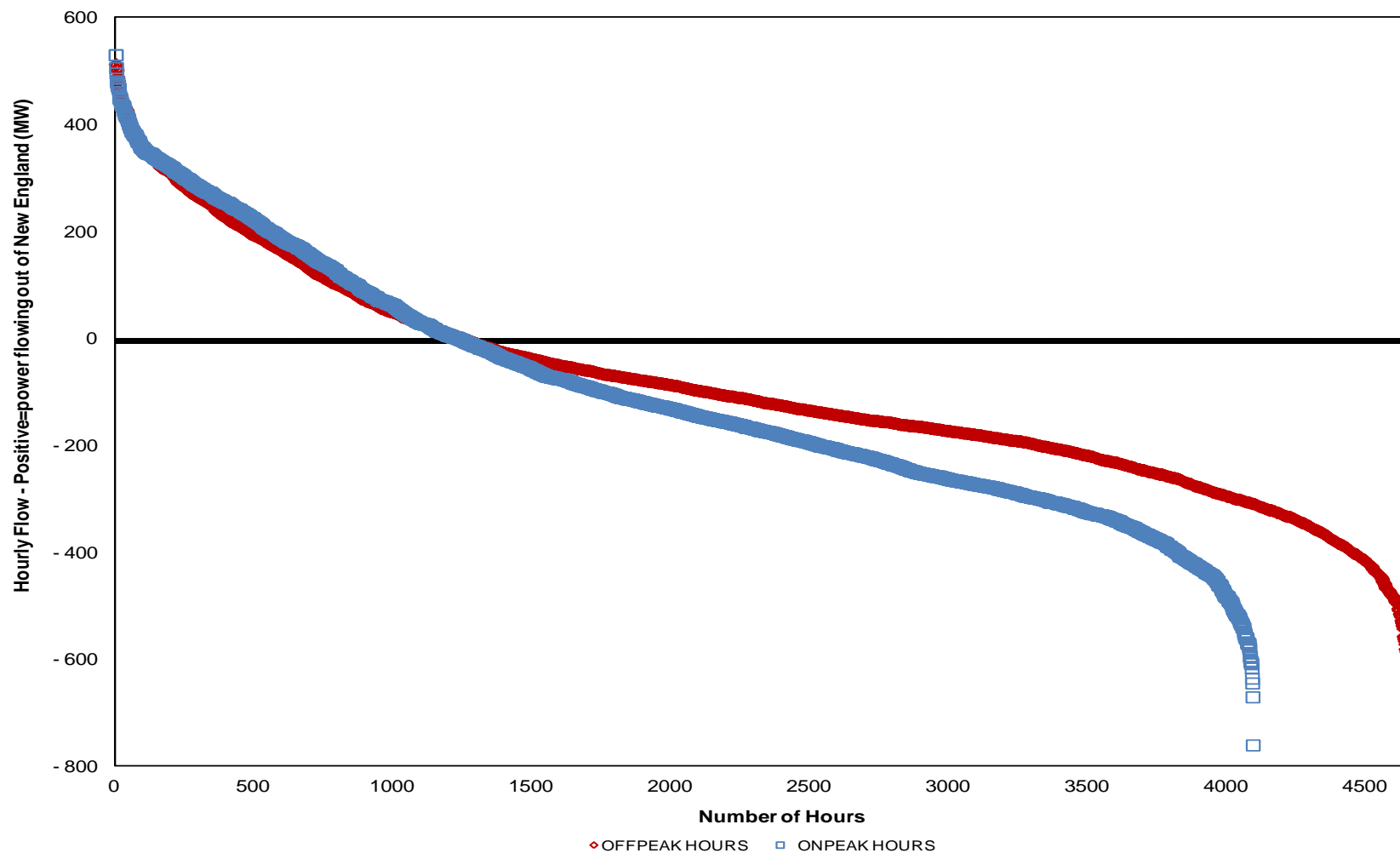
HQ Phase II Interface Duration Curve: Net Flow MWs
January - December 2011



New Brunswick Interface Duration Curve: Net Flow MWs
January - December 2011



New Brunswick Interface Duration Curve: Net Flow MWs
January - December 2011



Observations

- Energy prices are closely correlated with fuel prices
- There appears to be little congestion on the system as a whole
- In general, interface flows operate closer to the limit on peak as opposed to off peak
- Portions of the system that are remote from load centers, especially northern ME, have high negative loss components