



SCOTIA WEATHER SERVICES INC.

Mission To provide high quality, reliable valued-added environmental information services based on measured and modeled atmospheric, land and/or oceanographic physical parameters at competitive prices.



Scotia Weather Services Inc Overview

- Staff:** 6 professionally trained Meteorologists and 2 Information Technologies professionals
- Services:**
- ◆ Weather warnings/advisories,
 - ◆ Site-specific forecasts to 10 days,
 - ◆ Meteorological consultation/studies,
 - ◆ Weather and ocean data processing and communication
- Hardware:** Micro-computer technology with total of 19 units
- ◆ Internal 1 gigabyte Ethernet service,
 - ◆ Hardware firewall system
 - ◆ Automated power management units for all operational systems.
- Software –**
- ◆ Unix operating systems on all server, communications and archive computers,
 - ◆ Windows operating systems on forecaster productions workstations systems,
 - ◆ MySQL Relational Data Base System,
 - ◆ Apache web server, Q-mail for e-mail, FTP server
 - ◆ GrADS (GIS software) for model outputs and chart generation,
 - ◆ Weather Research and Forecast (WRF) Model,
 - ◆ Custom software in Java and C++ for product generation, data display and charts viewing
- Support System:** Diesel powered electrical generation system,
- ◆ Two Independent Service Provider high speed Internet Connection,
 - ◆ Auto fail-over and auto-load balancing firmware on our firewall,
 - ◆ Multiple commercial telephone connections, including cellular telephone service
- Facility:** Modern office building suite in Dartmouth, Nova Scotia, Canada



SCOTIA WEATHER SERVICES INC. SERVICES

Marine/Oceanographic services:

- warning service/advisories,
- site specific forecasts for harbours and ocean moorings (including sea state),
- route and area forecast services,
- briefing services/consultations, and more.

Clients:

- Exxon-Mobil
- Encana Corp
- Chevron/Texaco Inc,
- Shell Oil Ltd,
- Saipem PLC,
- Western Geophysical,
- Canaport Ltd. and CanaportLNG Partnership Inc,
- Dominion Diving Ltd,
- CalDive International, and more.

Other areas of SWSI service:

- Land and Aviation Transportation
- Oil/Gas Exploration and Production Services
- Electrical Utilities and Wind Energy production
- Agriculture/Forestry
- Air Quality
- Recreation
- Construction
- Forensic Meteorology



Background of Mac MacLeod

Education - Bachelor of Science Mount Allison University (1970)

- Diploma in Meteorology from Environment Canada (1971),
- Project Management, Strategic Planning, Financial Management and HR courses

Experience: - 40 years meteorological experience - 23 years as operational meteorologist

- 13 years of management experience within Environment Canada
- 14 years management experience in private industry,
- 7 years as President of Scotia Weather Services Inc.

WMO & IGOS Experience –

- Canadian representative on the Commission for Marine Meteorology 1986-1989,
- Canadian representative on the Intergovernmental Global Ocean Services System 1986-1989.

GTS Experience - User of GTS services for 40 years,

- Managed Canadian weather observation feeds to GTS for 5 years.
- Management of FM18 (drifting buoy) messages to GTS since Oct 2009



Scotia Weather Services Inc Communications

Internet Communications/FTP:

- weather warnings, advisories and forecast delivered to clients by e-mail, FTP services or web pages,
- dual ISP high speed connections connected to the SWSI Ethernet via hardware firewall
- Drifting Buoy messages delivered to Environment Canada via FTP feed.
- TAF products to the NavCanada Aviation Weather pages and to clients via e-mail

Weather Data Collection:

- Via FTP, SWSI collects weather observations from numerous client sites on a frequency that ranges from 5 minute to hourly data retrieval intervals.
- Via FTP push service, SWSI receives weather observations from land and ocean, weather warnings, advisories and forecasts from Environment Canada and NOAA
- Via Internet, SWSI has access to satellite and weather radar imagery

Atmospheric/Ocean Model Data Collection:

- Via Internet, binary data files in grib1 or grib2 format of regional and global atmospheric and ocean models are collected from the Canadian Meteorological Centre of Environment Canada and the National Centre for Environmental Prediction of the NOAA for times to 360 hours through the automated data management software of the SWSI production system.

Communications Security:

- Dedicated backup power generation system,
- Uninterrupted power units on communications and data base computer systems,
- Dual high speed Internet connections,
- Multiple telephone line service to our production/communications facility and
- 24/7 staff monitoring and trouble shooting/correction of the communications system.



SWSI Models for Quality Assurance

US GFS model – Global coverage, 3 hour time steps, horizontal resolution of 0.5 degrees (approx 56km at 45N)

US NWS NAM Model – North America, Caribbean Sea, Eastern Pacific Ocean and Western Atlantic Ocean, 3 hour time steps, horizontal resolution of 12 km approx at 45N)

Canadian Global GEM Model - Global coverage, 3 hour time steps, horizontal resolution of 67 km approx at 45N)

Canadian Regional GEM Model - North America, Caribbean Sea, Eastern Pacific Ocean and Western Atlantic Ocean, 3 hour time steps, horizontal resolution of 15 km approx at 45N)

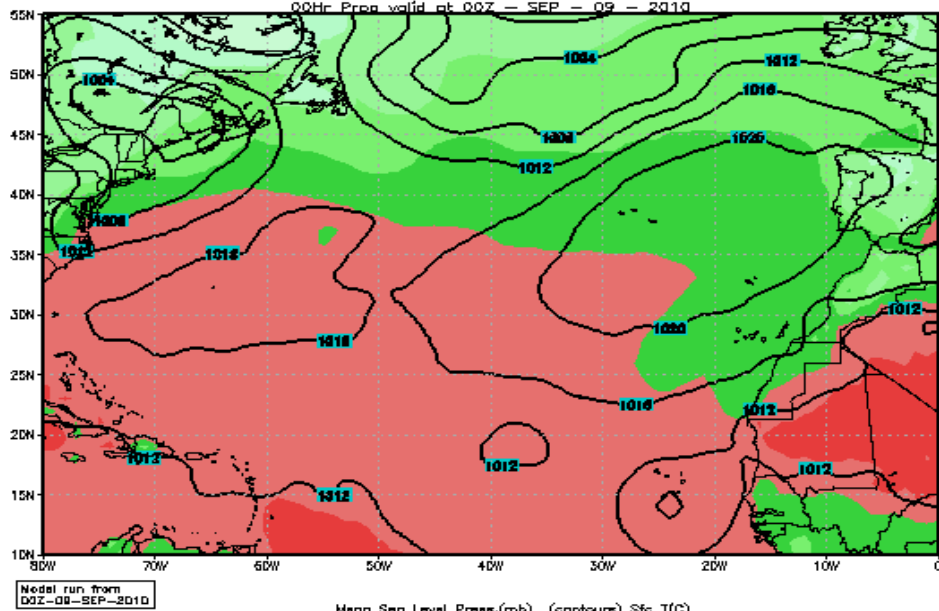
Wave Watch III Model – Global (1 degree), Western Atlantic (0.25 degrees), Eastern Pacific (0.25 degrees) and Arctic (0.25 degrees)

Canadian WAM model – Western North Atlantic, Eastern Pacific, 6 hour time steps, horizontal resolution of 0.33 degrees (approx 56km at 45N)

SWAN Model for Scotian Shelf region (Canadian Dept of Fisheries and Oceans), hourly time steps, horizontal resolution of 10 km (approx at 45N)

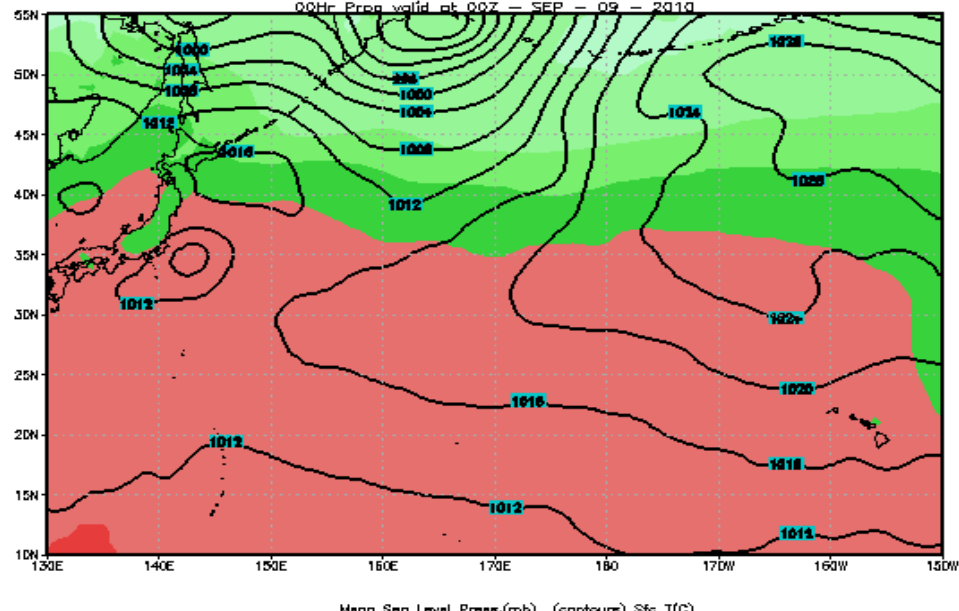


Scotia Weather Services Inc.
Atlantic Ocean MSLP and Surface Temps
00Hr Prog valid at 00Z - SEP - 09 - 2010



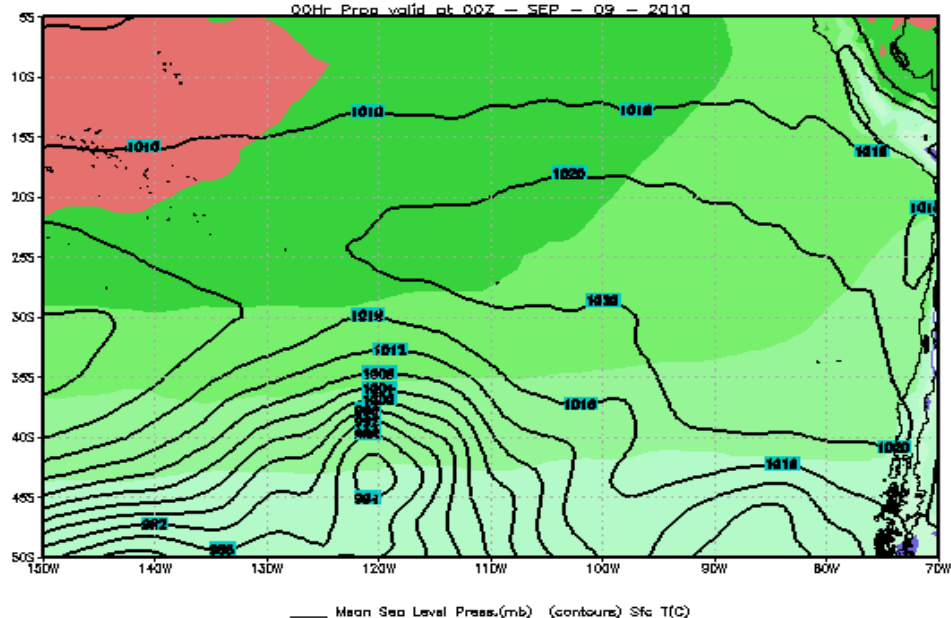
— Mean Sea Level Press.(mb) (contours) Sfc T(C)

Scotia Weather Services Inc.
Northwest Pacific Ocean MSLP and Surface Temps
00Hr Prog valid at 00Z - SEP - 09 - 2010



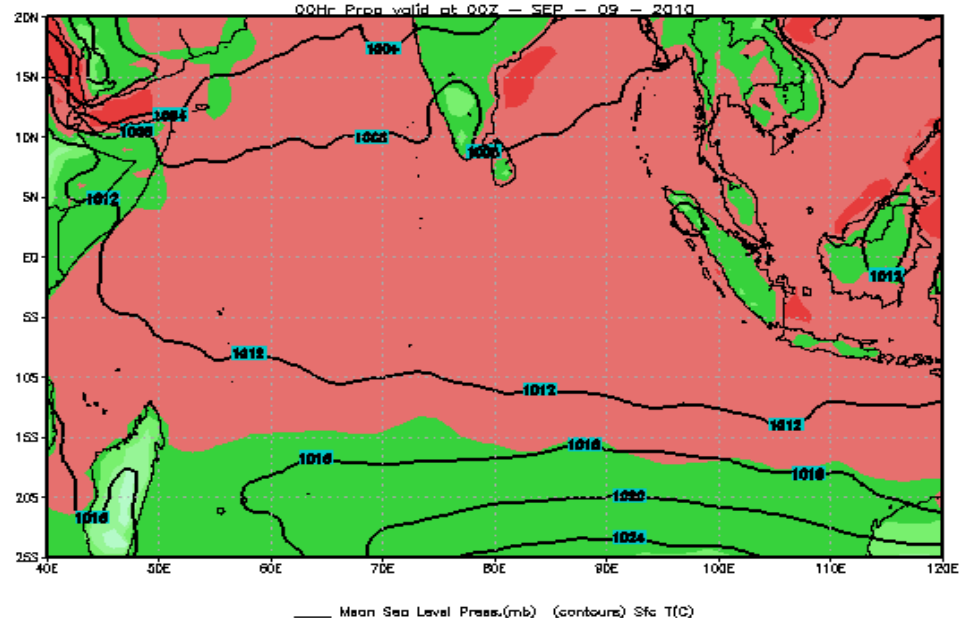
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Scotia Weather Services Inc.
Southeast Pacific Ocean MSLP and Surface Temps
00Hr Prog valid at 00Z - SEP - 09 - 2010

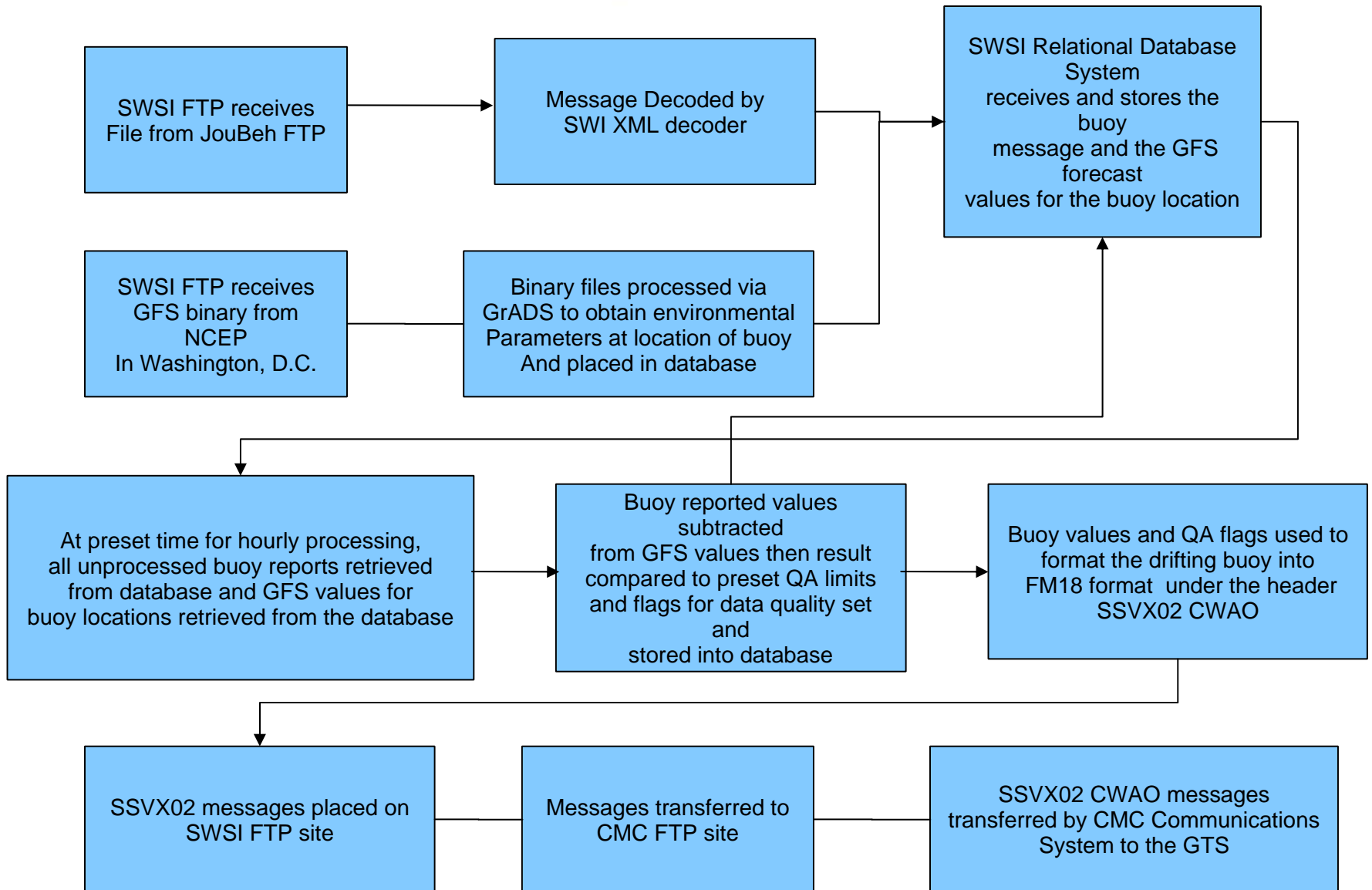


— Mean Sea Level Press.(mb) (contours) Sfc T(C)

Scotia Weather Services Inc.
Indian Ocean MSLP and Surface Temps
00Hr Prog valid at 00Z - SEP - 09 - 2010



— Mean Sea Level Press.(mb) (contours) Sfc T(C)





SWSI steps in QA of GTS Messages

- Decode of XML file from JouBeh Message to Database
- Extraction of atmos pressure and SST for buoy location from GFS fields and storage in data base
- Comparison of buoy report and forecast field for same date and time and setting of QA flags resulting from QA check
- Formatting of FM 18 message including QA flags and engineering values in group 4
- Transfer of FM18 formatted message to Environment Canada via FTP
- Check on FM18 format by Environment Canada communications system and relay to GTS
- FM 18 message programmed to SWSI data feed and stored to data base with date and time of receipt included.
- Check on message receipt versus message transfer for confirmation of delivery.
- Message to operational forecaster if FM18 message not returned within 2 minutes then manual transfer to Environment Canada and check on return.
- Auto-logging of file transfer and daily and monthly message counting by WMO ID number.



Overview of Procedures for GTS Message Generation

- Receive message from JouBeh Technologies in environmental values via FTP
- Decode and storage of message to SWSI database
- QA of values utilizing GFS fields and SST fields as available
- Generation of FM18 format message and storage to SWSI database
- Transfer to Environment Canada for release to the GTS with format check by Environment Canada
- Return of message from GTS (Environment Canada feed) and check if received or forecaster alerted for manual transmission to Environment Canada
- Logging of message generation and transfer with daily and monthly reports generated for system management.



Sample GTS Messages

SSVX02 CWAO 101200

ZZYY 47532 10090 1200/ 780015 070011 6113/ 11119 11016
40192 52003 444 20130 10090 1200/ 50501 81295 9/015=

SSVX02 CWAO 101300

ZZYY 56537 10090 1300/ 318734 095413 6113/ 11119 40183
52009 22219 00230 444 20130 10090 1300/ 50101 81375 9/015=

SSVX02 CWAO 101300

ZZYY 55574 10090 1300/ 344674 152864 6113/ 11119 49980
52025 22219 00115 444 20130 10090 1300/ 50101 81335 9/015=

SSVX02 CWAO 101300

ZZYY 48683 10090 1300/ 184535 008985 6110/ 11119 11095
40185 444 20130 10090 1300/ 50300 899900 =



Future Service Program Development

- Implementation of BUFR protocols and BUFR information generation and decode within SWSI communications software system to support Iridium message processing and coming changes to international environmental data exchange
- Preparation of monthly reports to JCOMM on buoy communications activity
- Statistical analysis and graphical presentation of buoy communications activity
- Implementation of FM 13 format message outputs
- Implementation of web interface for client activation of FM18 format buoy messages



Questions?

Thank you for your interest in our service

E-mail : mmacleod@scotiaweather.com Tele: 1-902-468-3866