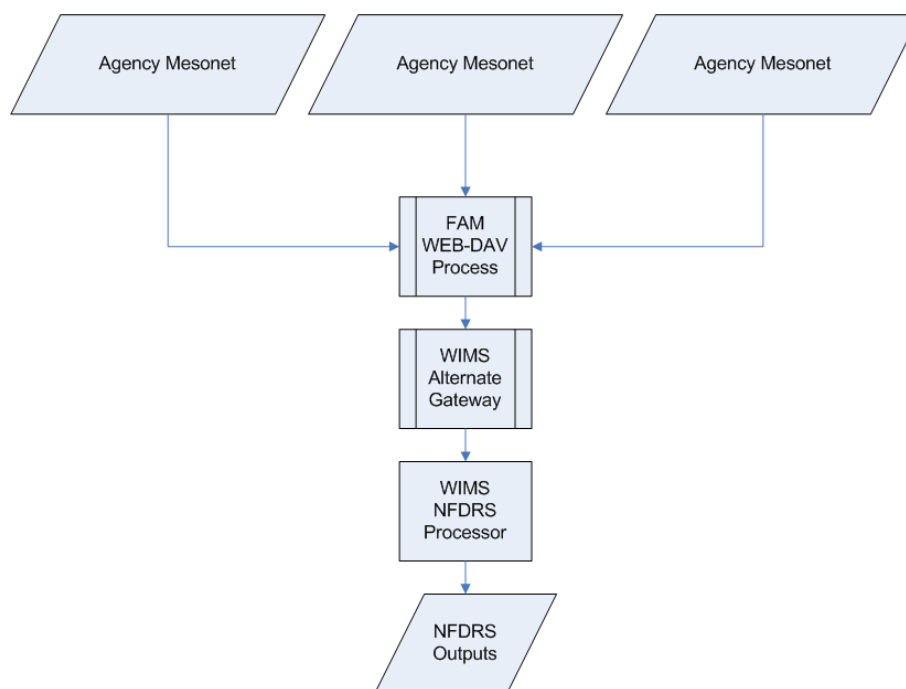


Protocols for WIMS Alternate Gateway

Objective: Provide pathway for observations from non-fire agency weather networks into WIMS to generate NFDRS outputs.



Larry S. Bradshaw
August 2008
Updated July 2012

Summary.

An alternate gateway using WEB-DAV protocols is running on both the WIMS Production (<https://fam.nwcg.gov/fam-web/wims/jsp/wims.htm>) and Test (<https://famtest.nwcg.gov/fam-web/wims/jsp/wims.htm>) gateways.

Weather Station Descriptions

Station Information. Stations must be type 6 (RAWS (non-SAT NFDRS)) and accurately populated with metadata. The NESDIS ID should be the same as the WIMS/NWS ID. The correct NWS Forecast Office should be specified to receive NFDRS forecasts through WIMS. Wind height sensor should be documented in comment field if different from the NFDR 20-foot standard. Below is an example of Station Information for a Florida Mesonet station.

The screenshot shows the WIMS-ESTA web application interface. The browser window title is "WIMS-ESTA - Mozilla Firefox". The address bar shows the URL "https://fam.nwoc.gov/wims/jsp/wims.htm". The page title is "Weather Information Management System". The main content area is titled "Display/Edit General Station Information ESTA".

Station ID: 89905
Nesdis ID: 89905
Last Modified Date: 04-Jan-12
Station Type: 6:RAWS (non-SAT NFDRS)
Region Number: 8
Elevation: 25 ft.
Local Time Zone: EST-Eastern(-5)
Mnemonic:
Observing Agency: 5 STATE
Unit Name:
Fcst Zone/NWS Ofc: JAX
User Comment: FLORIDA MESONET WIND SENSOR IS AT 10 METERS.

FIPS: 12 FLORIDA / List 113 Santa Rosa
Average Annual Precipitation: 50
Station Name: ST. JOHNS
Latitude: 29 Deg 53 Min 19 Sec or 29.8886111 Degree
Longitude: -81 Deg 27 Min 3 Sec or -81.4508333 Degree
Aspect: 1: Northeast (NE/45)
Owner: WVFL006
Lightning Scaling Factor: 1
Regular Scheduled Obs. Time: 13
Previous Station:
Site: 1: Valley bottom or flat
Access Control List: FL-PORTL

----- Unit Conversion Codes -----
Humidity Code: 2:Relative Humidity (percent)
Rainfall Code: 1:English (IN/MPH/Deg F)
Temperature Code: 1:English (IN/MPH/Deg F)
Wind Speed Code: 1:English (IN/MPH/Deg F)

----- Display/Edit Default NFDRS Parameters -----

NFDRS Parameters. Parameters (fuel models, staffing information, etc.) are the same as any other NFDRS station.

----- Display/Edit Default NFDRS Parameters -----

Station ID: 89905 Effective Date: 02-Mar-12 [Station Info](#) | [NFDRS Param](#) | [Extra Data Channels](#)

78 & 88 NFDRS	100-hr	20	SOW Thresholds (No Precip last 24 Hrs)	Pct Psbl	SOW & Wet Flag Thresholds (Precip last 24 Hrs)	CC3*	
	1000-hr	21			85	1HR_Drizzle (inches)	0.05
88 NFDRS	1hr=10hr	Y			75	1HR_Rain (inches)	0.1
	KBDI	460		50	1HR_Showers (inches)	0.25	
Snow Flag		N					
					3HR_DUR_WetFlag (hours)	3	
					3HR_AMT_WetFlag (inches)	0.5	
					24HR_DUR_WetFlag (hours)	12	
					24HR_AMT_WetFlag (inches)	1.0	

* Climate Class of the first priority Fuel Model (7G)

P r i	ID	** 78 NFDRS Only **										Staffing Idx Breakpoints					
		H S	Herb Date	Greenup Date	88 s b	S l p	G r s	C l i	Herb FM	Woody FM	X- 1000	SI	DC	Low		High	
														SI%	Val	SI%	Val
1	7G	G	04-Jan-12	04-Jan-12		1	P	3	180	166	20	EC	5	90	34	97	38
2	7B	G	04-Jan-12	04-Jan-12		1	P	3	180	166	20	EC	5	90	29	97	33

Extra Sensors. At this time Solar Radiation is the only “extra” sensor field that can be read in from the FW9 formatted data file. If included in the data field it should be on channel 9 using SHEF code RD (Radiation, Direct Beam)

----- Display/Edit Automated Sensor Station Information -----

Enter descriptions of added sensors found on this AUTOMATIC stations.
Please enter the descriptions in order of the sensor id.

Station ID: 89905 Nesdis ID: 89905 [Station Info](#) | [NFDRS Param](#) | [Extra Data Channels](#)

Del	Data Channel	SHEF Code	Sensor Description	<input type="button" value="Add"/>
<input type="checkbox"/>	9	RD <input type="button" value="List"/>	Radiation, Direct Beam Solar Radiation	

Oracle SQL scripts may be run by WIMS administrators to create stations using the Alternate Gateway. (See Appendix A.)

Data Requirements.

Standard Fire Weather Format. The agreed data transfer format will be the WXOBS98 data layout as described on the next page and illustrated below.

The transfer file may contain observations for any number of stations, typically for the same observation date and time. This is an example for 5 stations for "R" type observations (0900 LT), including solar radiation.

```
W98089939200803070900R6 67 90178 9 0 76 57 90 34 7 128N 212 12
W98089933200803070900R6 67 93177 5 0 76 59 93 33 4 159N 212 7
W98089934200803070900R6 67 90178 9 0 76 57 90 34 7 128N 212 12
W98089956200803070900R6 79 72176 14 0 81 70 97 72 3 691N 212 509
W98089918200803070900R6 62 94171 2 0 72 56 97 37 6 276N 212 142
```

The next example illustrates only "O" observations for five stations which would be converted into NFDRS records of type "O."

```
W98089906200803070900O3 73 84170 10 0 75 60 93 28 5 137N 212 212
W98089914200803070900O2 60 96140 9 0 71 57 96 33 6 609N 212 61
W98089915200803070900O0 64 88 0 0 0 71 51 93 28 7 331N 212 150
W98089916200803070900O5 64 89140 8 0 69 57 93 39 6 326N 212 127
W98089901200803070900O6 75 83160 18 0 75 64 93 99 8 144N 212 256
```

Weather Observation Data Transfer Format, 1998 (WxObs 98)

Item	Cols	Type	Description	wims.observation column
1	01-03	3A	Record type (W98). All records begin with this identifier.	Required
2	04-09	6N	Station Number.	Required
3	10-17	8N	Observation date (YYYYMMDD).	Required
4	18-21	4N	Observation time (0000-2359).	Required
5	22	1A	Observation type (O=NFDRS, R=RAWS other than at the standard NFDRS observation time).	(O/R) Required
6	23	1N	State of weather code.	(0-9) Required if Obs type = "O"
7	24-26	3N	Dry bulb temperature (deg F).	(-40 to 120) Required
8	27-29	3N	Atmospheric moisture (wet bulb temperature, relative humidity (percent), or dewpoint temperature based on Moisture Type code [col. 62]).	(1 – 100) Required
9	30-32	3N	Wind direction azimuth measured from true north. 0 (zero) means no wind direction, 360 is north.	Required
10	33-35	3N	Average windspeed over a 10-minute period (miles per hour).	(0-100) Required
11	36-37	2N	Measured 10-hour time lag fuel moisture.	(1-60) Optional
12	38-40	3N	Maximum Temperature (deg F).	(-40 to 120 & >= DRY_BULB_TEMP) Optional
13	41-43	3N	Minimum Temperature (deg F)	(-40 to 120 & <= DRY_BULB_TEMP) Optional
14	44-46	3N	Maximum relative humidity (percent).	(1 to 100 & >= RELATIVE_HUMIDITY) Optional
15	47-49	3N	Minimum relative humidity (percent).	(1 to 100 & >= RELATIVE_HUMIDITY) Optional
16	50-51	2N	Precipitation duration (hours).	(0 to 24) Required
17	52-56	5N	Precipitation amount based on Measurement Type code [col. 63]. Blanks=no precipitation. <i>U.S. measurement:</i> inches with implied decimal nn.nnn format; trace shown as 00005.	(0 to 25) -- 00000 to 25000 Required

18	57	1A	Wet flag (Y/N).	(Y or N) Default is "Y" for State of Weather 5, 6, and 7. Required
19	58-59	2N	Herbaceous greenness factor (0-20).	0 to 20 Optional
20	60-61	2N	Shrub greenness factor (0-20).	0 to 20 Optional
21	62	1N	Moisture Type code (1=Wet bulb, 2=Relative Humidity, 3=Dewpoint).	Required
22	63	1N	Measurement Type code: 1=U.S.	Required
23	64	1N	Season code (1=Winter, 2=Spring, 3=Summer, 4=Fall).	1 to 4 Optional
24	65-68	4N	Solar radiation (watts per square meter).	0 to 2000 Optional

There may be hourly observations or once daily. If hourly observations are being entered the observation type shall be "R" except for the 1300 (LST) observation, which shall be type "O" to indicate it is the Standard NFDRS observation for the day.

All 24 hour maximum and minimum values are 'running 24-hour values' not for the calendar day.

Data must be formatted exactly to the documented FW9 format. Observation types may be both "R" and "O" (hourly data with 1 NFDRS observation/day) or "O" only (1 NFDRS observation/day).

The "O" observation should have a valid State of Weather Code and Wet Flag. If a 1988 Fuel Model is used, the record should also include a valid Season Code and greenness factors for the Herbaceous and Woody fuel moistures.

1. **NFDR "O/R"**. The FW9 format allows for "O" and "R" type observations. The FW9 "O" observation should also have a valid state of the weather code. WRCC *Data Lister* files may have the "O" designation at 1300 local time but will not have a valid state of the weather code (it is blank). FireFamilyPlus will interpret the blank to be zero (0). Non "O" type records are typed "R" (for Raws) and are not processed as NFDRS records in FireFamily.
2. **State of the weather (SOW)**. This is an assessment of the sky conditions at the observing station used to indicate the amount of cloud cover and kind of precipitation at the fire weather station at observation time. Within the NFDRS processor, the SOW is used to establish the ground/fuel level temperature and relative humidity at the weather station. These values are used in the dead fuel moisture calculations. It also established some "values by rule" as noted in the table below.

State of Weather (SOW) Codes

0 - Clear, less than 1/10 cloud cover	5 - Drizzle
1 - Scattered clouds, 1/10 - 5/10 cloud cover	6 - Rain
2 - Broken clouds, 6/10 - 9/10 cloud cover	7 - Snow or sleet
3 - Overcast, 10/10 cloud cover	8 - Showers
4 - Fog	9 - Thunderstorms
NOTE - 5, 6, and 7 cause an internal wet flag to be set to "Y." In this case, 1 and 10 hour fuel moistures are set to 35% and indices (BI, SC, IC) are set to zero because generalized precipitation over the protection unit is assumed. The ERC is computed as normal. Values 8 and 9 assume localized precipitation and the wet flag is not set to "Y."	

3. **Wet Flag and Snow Cover.** This entry is used in the operational NFDRS (WIMS) to indicate when the fuels are wet at observation time. The Wet Flag is automatically set to "Y" by the danger-rating processor if SOW code "5", "6", or "7" is entered. *Only in FW9 Format from KCFAST and from 1993 on.*

Both year round and seasonal stations should consider snow covered fuels. With the wet flag set to Y, but the SOW is not 5, 6, or 7, the NFDRS processor interprets the wet flag =Y to indicate snow-covered fuels. In this case, the NFDRS processor:

- Internally sets the fuel interface maximum and minimum relative humidity at 100 percent regardless of the ambient relative humidity.
- Invokes the "values by rule" of the wet flag setting.
- Internally estimates hours of snowmelt (precipitation duration) to add moisture to the 100- and 1000-hour fuels based on observation time temperature.

Observation Time Temperature	Hours Fuels Wet
<= 35	0
36 to 40	2
41 to 50	4
51 to 60	6
> 61	8

Station and observation management is done with ENFDR, DRAWS, DOBS/EOBS, DIDX, etc.

Display/Edit Default NFDRS Parameters

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Station ID: Effective Date:

78 & 88 NFDRS	100-hr	16		SOW Thresholds (No Precip last 24 Hrs)	Pct Psbl	SOW & Wet Flag Thresholds (Precip last 24 Hrs)	CC 3* <small>Default?</small>
	1000-hr	19					
	1hr=10hr	<input checked="" type="checkbox"/>		PCNT_Clear	85	1HR_Drizzle (inches)	0.05
	KBDI	398		PCNT_Scattered	75	1HR_Rain (inches)	0.1
Snow Flag			<input type="checkbox"/>	PCNT_Broken	50	1HR_Showers (inches)	0.25
						3HR_DUR_WetFlag (hours)	3
						3HR_AMT_WetFlag (inches)	0.5
						24HR_DUR_WetFlag (hours)	12
						24HR_AMT_WetFlag (inches)	1.0

* Climate Class of the first priority Fuel Model (7G)

Del	Pri	ID	** 78 NFDRS Only **				88 sb	S lp	G rs	C li	Herb FM	Woody FM	X- 1000	Staffing Idx Breakpoints					
			H S	Herb Date	Greenup Date	Low								High					
						SI								DC	SI%	Val	SI%	Val	
<input type="checkbox"/>	1	7G	T	01-Feb-12	04-Jan-12			P	3	100	150	15	EC	5	90	34	97	38	
<input type="checkbox"/>	2	7B	T	01-Feb-12	04-Jan-12		1	P	3	100	150	15	EC	5	90	29	97	33	

Remote Automatic Weather Station Display DRAWS

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Station ID: or SIG: Date: Start Time:

Station ID	Obs Date	Obs		O T	Dry Tmp	RH	Wind		Temp		RH%		RGauge	Hrly Prcp	BVIt	BPress	Fuel Temp	RAWS Sensor Data
		HH	MM				Dir	Sp	Max	Min	Max	Min						RD
<input checked="" type="checkbox"/>	089901	09-Jul-12	13	0	0	85	72	110	9	87	77	91	70		0.0			781
<input checked="" type="checkbox"/>	089901	09-Jul-12	12	0	R	85	75	120	8	87	77	91	70		0.0			822
<input checked="" type="checkbox"/>	089901	09-Jul-12	11	0	R	84	75	110	6	87	77	91	70		0.0			733
<input checked="" type="checkbox"/>	089901	09-Jul-12	10	0	R	85	70	0	3	87	77	91	70		0.0			594
<input checked="" type="checkbox"/>	089901	09-Jul-12	9	0	R	83	74	0	0	87	77	91	70		0.0			437
<input checked="" type="checkbox"/>	089901	09-Jul-12	8	0	R	80	85	0	0	87	77	91	70		0.0			234
<input checked="" type="checkbox"/>	089901	09-Jul-12	7	0	R	77	91	0	0	87	77	91	70		0.0			61
<input checked="" type="checkbox"/>	089901	09-Jul-12	6	0	R	78	91	190	3	87	78	91	70		0.0			0
<input checked="" type="checkbox"/>	089901	09-Jul-12	5	0	R	78	90	200	3	87	78	90	70		0.0			0
<input checked="" type="checkbox"/>	089901	09-Jul-12	4	0	R	80	87	230	4	87	78	92	70		0.0			0

Display Observations DOBS

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Station ID: or SIG: Type: Date: Time:

Station ID	Obs Date	Ob Tm	O T	W	Dry Tmp	RH	M L	HC Rsk	Wind		10 Hr	Temp		RH%		Dur	Amt	Y L	FHC Rsk	W F	RD	SR%
									Dir	SP		Max	Min	Max	Min							
<input checked="" type="checkbox"/>	089901	09-Jul-12	13	0	3	85	72			110	9	87	77	91	70	0	0			N	781	
<input checked="" type="checkbox"/>	089902	09-Jul-12	13	0	1	90	56			238	4	92	73	97	53	2	0.129			N	948	
<input checked="" type="checkbox"/>	089903	09-Jul-12	13	0	8	77	87			87	1	78	72	99	84	6	1.068			N	352	
<input checked="" type="checkbox"/>	089904	09-Jul-12	13	0	1	90	66			241	4	94	75	97	49	3	0.39			N	873	
<input checked="" type="checkbox"/>	089905	09-Jul-12	13	0	1	90	56			238	4	92	73	97	53	2	0.129			N	948	

Display Index Format DIDX

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Station ID: or SIG: Type: Date: Time:

Station ID	Dt	Tm	Tp	MSGC	WS	WDY	HRB	1H	10	HU	TH	XH	IC	SC	EC	BI	SL	R	KBDI	FL	LR	LO	HR	HO
89901	070912	13	0	7G1P3	9	150	100	13	14	16	19	15	5	5	22	27	3	M	398	19	0	0	0	0
89901	070912	13	0	7B1P3	9	150	100	13	14	16	19	15	2	3	4	9	1	L	398	6	0	0	0	0
89902	070912	13	0	7G1P3	4	186	150	8	10	17	23	21	9	2	17	16	2	L	274	11	0	0	0	0
89902	070912	13	0	7B1P3	4	186	150	8	10	17	23	21	7	2	17	17	3	M	274	12	0	0	0	0
89903	070912	13	0	7G1P3	1	170	137	19	19	20	22	18	0	1	12	9	2	L	246	6	0	0	0	0
89903	070912	13	0	7F1P3	1	170	137	19	19	20	22	18	0	0	0	0	1	L	246	0	0	0	0	0
89904	070912	13	0	7G1P3	4	173	135	9	11	16	22	18	8	2	19	17	3	M	259	12	0	0	0	0
89904	070912	13	0	7B1P3	4	173	135	9	11	16	22	18	6	2	14	15	2	L	259	11	0	0	0	0
89905	070912	13	0	7G1P3	4	185	150	8	10	17	23	21	9	2	17	16	2	L	274	11	0	0	0	0
89905	070912	13	0	7B1P3	4	185	150	8	10	17	23	21	7	2	17	17	3	M	274	12	0	0	0	0

Data Archive: Both the 'O' and 'R' type observations will automatically be archived in the WIMS archive and the FAMWEB Data Warehouse.

Currently the hourly observations will not be sent to the Western Region Climate Center where hourly RAWS observations are stored.

Error and Process Logs:

Error and processing information will be available under the WIMS fastpath LAWS (Log of Automated Weather Stations).

Log Information A1206200 000001

[End](#) [Back to List](#)

12062 00:35:02 Alternative Automated Weather Station - Automated Gateway
12062 00:35:02 WIMS-AWS Gateway is now available
12062 00:35:02 Version 1.0.0 - PRODUCTION
12062 00:35:02 AWS015D-WIMS: Duplicate deletion flag is TRUE
12062 00:35:07 AWS017N-WIMS: Commit point reached record count = 67
12062 00:35:07 SPECIAL: Valid AWS Obs: 67 ## Invalid: 0 ## Total Records: 67
12062 01:35:02 Alternative Automated Weather Station - Automated Gateway
12062 01:35:02 WIMS-AWS Gateway is now available
12062 01:35:02 Version 1.0.0 - PRODUCTION
12062 01:35:02 AWS015D-WIMS: Duplicate deletion flag is TRUE
12062 01:35:06 AWS017N-WIMS: Commit point reached record count = 67
12062 01:35:06 SPECIAL: Valid AWS Obs: 67 ## Invalid: 0 ## Total Records: 67
12062 02:35:03 Alternative Automated Weather Station - Automated Gateway
12062 02:35:03 WIMS-AWS Gateway is now available
12062 02:35:03 Version 1.0.0 - PRODUCTION
12062 02:35:03 AWS015D-WIMS: Duplicate deletion flag is TRUE
12062 02:35:08 AWS017N-WIMS: Commit point reached record count = 67
12062 02:35:08 SPECIAL: Valid AWS Obs: 67 ## Invalid: 0 ## Total Records: 67

Appendix A – Sample Script to Create a Type 6 Station via Script instead of the WIMS Application.

```
INSERT INTO station_information (station_id, aspect, assoc_manual_station, previous_station,
access_list, default_woody_fm, elevation, fest_zone, unit_name, fuel_stick_installation_date,
humidity_code, latitude, latitude_deg, latitude_min, latitude_sec, lightning_scaling_factor,
longitude, longitude_deg, longitude_min, longitude_sec, nesdis_id, observing_agency,
fips_state, fips_cnty, avg_annual_precip, pressure_code, region_number, station_type, site,
reg_scheduled_observation_time, station_create_mod_date, station_name, temperature_code,
time_zone, nemonic, user_comments, user_id, wind_direction_code, wind_speed_code,
init_kbdi, season_code, one_ten_flag, woody_fm_meas_date, state, grass_green_factor,
shrub_green_factor, snow_flag, pcnt_clear, pcnt_scattered, pcnt_broken) VALUES (313441, '6',
NULL, NULL, 'NC-CLIM', NULL, 6200, 'GSP', NULL, NULL, 2, 35.7585, 35, 45, 31, 1, -
82.2712, -82, 16, 16, '313441', 5, 37, 199, 72.97, 1, 8, 6, 2, 13, '16-Apr-2012', 'MT MITCHELL
ST PARK', 1, 'EST', 'MITC', 'NC ECONET', 'WINC058', 1, 1, NULL, NULL, NULL, NULL,
'NC', NULL, NULL, 'N', 85, 75, 50);COMMIT;
```

```
INSERT INTO raws_sensors (nesdis_id, sensor_id, short_desc, sensor_desc) VALUES
('313441', 9, 'RD', 'Radiation, Direct Beam Solar Radiation');COMMIT;
```

```
INSERT INTO fuel_models (station_id, fuel_model, model_priority, date_modified,
percent_fm_rep, slopeclass, grasstype, shrub_type, greenup_date, herb_veg_date,
herb_veg_stage_code, herb_veg_stage_number, grass_green_factor, shrub_green_factor,
silo_value, sihi_value, silo_percent, sihi_percent, number_display_classes, climate_class,
staffing_index) VALUES (313441, '7G', 1, '16-Apr-2012', 100, 1, 'P', 'D', '01-Jun-2012', '01-Jun-
2012', 'P', 1, NULL, NULL, NULL, NULL, NULL, NULL, NULL, 3, NULL);COMMIT;
```

```
INSERT INTO station_sow_para (station_id, climate_class, one_hr_drizzle, one_hr_rain,
one_hr_shower, three_hr_dur_wetflag, three_hr_amt_wetflag, twentyfour_hr_dur_wetflag,
twentyfour_hr_amt_wetflag) VALUES (313441, 3, 0.05, 0.1, 0.25, 3, 0.5, 12, 1.0);COMMIT;
```