

SEAMAP 2016 Late Summer King Mackerel / Red Drum Ichthyoplankton Survey Cruise Report

Alabama Marine Resources Division
P.O. Box 189
Dauphin Island, Al. 36528

Introduction

The SEAMAP Fall King Mackerel / Red Drum Ichthyoplankton Survey is conducted to provide fishery-independent monitoring assessment and shrimp abundance and location information essential to management of Alabama and near shore FMZ Gulf of Mexico fisheries resources in a coordinated and cost-efficient program. Fishery-independent information is that collected without direct reliance on statistics reported by commercial or recreational fishermen.

Objectives

1. Conduct a late summer ichthyoplankton survey to collect information on king mackerel and red drum larval abundance and distribution with standard SEAMAP neuston and bongo nets.
2. Collect information on environmental parameters (salinity, temperature, dissolved oxygen, wind speed and direction) in conjunction with sampling.
3. Code all data according to approved NMFS SEAMAP Operations Manual guidelines.
4. Submit data to the Gulf States Marine Fisheries Commission Data Manager.

Methods

The vessel that participated in the Alabama Late Summer Ichthyoplankton Survey was the Alabama Discovery (#77). A bongo net was lowered along the port side of the vessel. As the bongo nets were lowered to depth and retrieved to the surface, tows were conducted at or near 2 knots for 3 minutes when possible. If a single bongo oblique was at the surface before 3 minutes had lapsed, a second oblique was sent to the bottom and retrieved. This was done per the instructions of NOAA officials. The bongo tows for 77001 and 77003 were sent down to the bottom twice during a single tow. A neuston net was lowered along the starboard side. Towing was conducted at or near 2 knots for 10 minutes at the surface for the neuston net. The ichthyoplankton data sheets with the start/stop coordinates, time and flowmeter readings for these tows will be submitted along with the tow data sheets and samples. Sample work-up and data processing was conducted in accordance with the NMFS SEAMAP Operations Manual guidelines. Environmental data were collected in conjunction with each sample. Temperature, dissolved oxygen, salinity, and transmissivity values were measured with a CDT. A sechi disc was also used to determine water clarity. The vessel's instruments were used to take wind speed and direction, vessel speed, atmospheric pressure, and depth. The vessel's air temperature instrument was not functional.

Results

Neuston samples (NN) were collected at 3 stations and bongos (PN) at 3 stations in gulf statistical zones 10 on the 8th of September 2016. (Table 1)

Deviations

For each station we alternated between casting the CTD and sampling with the bongos first. This decision was made because we utilized the same davit winch for both instruments. The first instrument we used was whichever one was shackled to the winch cable from the last station. Neuston tows were always conducted last.

Cruise participants:

Alabama Marine Resources Division personnel Jason Herrmann, William Tarver, Lauren Jakubowski, Lucas Brantley, and Tyler Rose collected samples. All bongo and neuston samples were preserved in 10 percent formalin solution. No samples were transferred to ethanol per the request of NOAA officials. CTD data was extracted and processed by Jason Herrmann. CTD data was QA/QCed by Jason Herrmann. Pascagoula station, Ichthyoplankton, and Environmental data entry was conducted by Jason Herrmann. Cruise report was prepared and submitted by Jason Herrmann.

Submitted By:



Jason E. Herrmann

10/11/2016

Table 1. AMRD SEAMAP 2016 Late Summer King Mackerel/Red Drum Ichthyoplankton Survey Report Summary.

| STA# | DATE | | TIME | LAT | LON | STAT | | | DO | | | SAL | | | TEMP | | | MIN |
|-------|----------|----------|-------|----------|----------|------|------|-----|-----|-----|------|------|------|------|------|------|------|---------|
| | MM/DD/YY | MM/DD/YY | | | | ZONE | GEAR | SUR | MID | MAX | SUR | MID | MAX | SUR | MID | MAX | SUR | |
| 77001 | 09/08/16 | | 09:45 | 30 14.31 | 87 30.02 | 10 | PN | 5.5 | 5.4 | 5.9 | 31.1 | 31.5 | 32.0 | 29.2 | 29.6 | 29.6 | 29.6 | 2.1 min |
| | | | 10:45 | 30 13.07 | 87 30.24 | 10 | NN | 5.5 | 5.4 | 5.9 | 31.1 | 31.5 | 32.0 | 29.2 | 29.6 | 29.6 | 29.6 | 10 min |
| 77002 | 09/08/16 | | 12:14 | 29 58.80 | 87 29.99 | 10 | PN | 6.3 | 6.3 | 3.9 | 32.4 | 32.6 | 34.0 | 29.9 | 29.5 | 28.2 | 28.2 | 3.6 min |
| | | | 12:36 | 29 58.84 | 87 29.99 | 10 | NN | 6.3 | 6.3 | 3.9 | 32.4 | 32.6 | 34.0 | 29.9 | 29.5 | 28.2 | 28.2 | 10 min |
| 77003 | 09/08/16 | | 14:37 | 30 00.02 | 87 57.05 | 10 | PN | 6.3 | 6.2 | 5.1 | 31.7 | 31.7 | 33.7 | 29.6 | 29.3 | 28.6 | 28.6 | 4.7 min |
| | | | 15:01 | 30 00.02 | 87 56.99 | 10 | NN | 6.3 | 6.2 | 5.1 | 31.7 | 31.7 | 33.7 | 29.6 | 29.3 | 28.6 | 28.6 | 10 min |

Submitted by: Jason E. Herrmann

Date Submitted: 10/11/2016

SEAMAP PLANKTON STATION SHEET

Shift Leader Initials JH

Page 1 of 2

PASCAGOULA #

77001

SEAMAP STATION #

B321

VESSEL

77

CRUISE

1602

SOURCE

AL

MON

09

DAY

08

YR

16

ZONES

STATISTICAL

10

FAUNAL

06

TIME

4

ON STATION TIME

START

HH MM

0845

END

HH MM

1100

PLANKTON ACTUAL BEGINNING COORDINATES

LATITUDE DEG MINUTES

3014.27

LONGITUDE DEG MINUTES

8730.05

Start

ACTUAL WATER DEPTH

(M)

12.9

end

13.9

PLANKTON ACTUAL ENDING COORDINATES

LATITUDE DEG MINUTES

3013.08

LONGITUDE DEG MINUTES

8730.75

Sargassum in area? If so, circle one:

Current-driven Windrow, Wind-driven Windrow, Oceanic Frontal Zone (OFZ), Large Mats, Scattered Clumps, Scattered Mats/Clumps along OFZ

GEAR TYPES USED AT THIS STATION (CIRCLE GEAR TYPES USED OR ADD ADDITIONAL GEARS USED):

BG BC PN NN SE CA SX OX TC

SEAMAP PLANKTON TOW SHEET

Shift Leader Initials JH

VESSEL 77 CRUISE 1602 SOURCE AL

PASCAGOULA #

SEAMAP STATION #

RECORDER (INITIALS)

77001

8321

MON 09 DAY 08 YR 16

LJ

BONGO

NEUSTON

DEPTH CODE 03 MESH NET # 01
(C/O) 01 GEAR

DEPTH CODE 09 MESH NET # 02
(C/O) 03 GEAR

MIN TOW DEPTH (M) 00000 MAX TOW DEPTH (M) 00132

MIN TOW DEPTH (M) 00000 MAX TOW DEPTH (M) 00010

AT MAX DEPTH

HH 09 MM 44 ANGLE 45 WIRE OUT 17

IN TIME OUT

X 2nd Drop

HH MM SS IN TIME OUT
094335 094543

HH MM SS IN TIME OUT
103524 104532

10:35:24 10:45:32

BONGO ACTUAL BEGINNING COORDINATES

NEUSTON ACTUAL BEGINNING COORDINATES

LATITUDE DEG MINUTES 301431 LONGITUDE DEG MINUTES 873002

LATITUDE DEG MINUTES 301307 LONGITUDE DEG MINUTES 873024

30 13 07
87 30 24

BONGO ACTUAL ENDING COORDINATES

NEUSTON ACTUAL ENDING COORDINATES

LATITUDE DEG MINUTES 301427 LONGITUDE DEG MINUTES 873008

LATITUDE DEG MINUTES 301307 LONGITUDE DEG MINUTES 873042

30 13 07
87 30 42

FLOWMETER

JELLYFISH PRESENT IN NET?

LEFT METER ID # 26524 RIGHT METER ID # 23258
START 331809 START 036116
END 335317 END 039488

Y, IF YES, AMT (L):

1 gal of jelly

SARGASSUM PRESENT IN NET?

N, IF YES, AMT (L):

NEUSTON TOW SPEED (KT)

23

1.8 kt

BONGO TOW SPEED (KT)

24

PRESERVATIVE USED: RIGHT BONGO

FORMALIN (INITIAL) / ETHANOL (FINAL)

PRESERVATIVE USED: LEFT BONGO

ETHANOL (INITIAL) / ETHANOL (FINAL)

PRESERVATIVE USED: NEUSTON

ETHANOL (INITIAL) / ETHANOL (FINAL)

BONGO SEAMAP SAMPLE NUMBERS

NEUSTON SEAMAP SAMPLE NUMBER

LEFT 51834 RIGHT 51835

51836

COMMENTS:

Wire Out: 17 m, _____ ft
Calculated Max Tow Depth = $120 = \cos(45) = 17$

Jars: 1 L Bongo 1602
2 R Bongo 1602
1 Neuston 3202

X 2 drops

orgo white 900ml July

1.5 gal bongo grey jelly

SEAMAP ENVIRONMENTAL DATA SHEET

Shift Leader Initials JH

PASCAGOULA #

77001

SEAMAP STATION #

B321

VESSEL

77

CRUISE

1602

SOURCE

AL

ZONES

STATISTICAL

10

FAUNAL

06

TIME

4

MON

09

DAY

08

YR

16

WAVE HT. (m)

00.5

WIND DEGREES

57

KNOTS

13

STAT. LOCATION

S

PRECIPITATION

0

AIR TEMP (°C)

72.9

BAROMETRIC PRESSURE (mbar)

1019

SEA CONDITION (BEAUFORT SCALE)

02

DAYLIGHT ONLY:

WATER COLOR

B

% CLOUD COVER

0, 25, 50, 75, 100

SECCHI DISC (m)

13.0

WATER DATA FROM CTD CAST

| | DEPTH (m) | CONDUCTIVITY (RATIO) | SALINITY | TEMPERATURE (°C) | DISSOLVED OXYGEN |
|-----|-----------|----------------------|----------|------------------|------------------|
| TOP | 1.0 | 51.7270 | 31.05 | 29.24 | 5.48 |
| MID | 7.0 | 52.6718 | 31.47 | 29.56 | 5.41 |
| BOT | 13.0 | 53.5190 | 32.03 | 29.57 | 5.85 |

TRANSMISSIVITY

TOP 94
MID 94
BOT 93

CTD Coordinates:

LATITUDE DEG MINUTES

30 14.25

LONGITUDE DEG MINUTES

87 30.11

CTD START

HH MM
08 56

CTD END

HH MM
08 58

FILE ID

CHLOROPHYLL

*FROM LAB (Mg/M³)

SURFACE

0.0000

MIDWATER

0.0000

BOTTOM

0.0000

CHLOROPHYLL

*FROM CTD (Mg/M³)

SURFACE

0.0000

MIDWATER

0.0000

BOTTOM

0.0000

COMMENTS:

Type of CTD used:

SEAMAP PLANKTON STATION SHEET

Shift Leader Initials JH

PASCAGOULA #
77002

SEAMAP STATION #
B173

VESSEL 77 CRUISE 1602 SOURCE AL
MON 09 DAY 08 YR 16

ZONES
STATISTICAL 10 FAUNAL 06 TIME 4

ON STATION TIME

START END
HH MM HH MM
1207 1244

PLANKTON ACTUAL BEGINNING COORDINATES

LATITUDE DEG MINUTES 29 58 78
LONGITUDE DEG MINUTES 87 29 97

start
ACTUAL WATER DEPTH (M)

30 8

PLANKTON ACTUAL ENDING COORDINATES

LATITUDE DEG MINUTES 29 58 92
LONGITUDE DEG MINUTES 87 30 20

end 29 3

Sargassum in area? If so, circle one:
Current-driven Windrow, Wind-driven Windrow, Oceanic Frontal Zone (OFZ), Large Mats, Scattered Clumps, Scattered Mats/Clumps along OFZ

GEAR TYPES USED AT THIS STATION (CIRCLE GEAR TYPES USED OR ADD ADDITIONAL GEARS USED):

BG BC PN NN SE CA SX OX TC

SEAMAP PLANKTON TOW SHEET

Shift Leader Initials JH

VESSEL

CRUISE

SOURCE

PASCAGOULA #

SEAMAP STATION #

RECORDER (INITIALS)

77602

B173

77

1602

AL

MON DAY YR
09 08 16

LJ

BONGO

DEPTH

CODE

03

MESH

NET #

01

(C/O)

0

01

GEAR

DEPTH

CODE

09

MESH

NET #

02

(C/O)

0

03

GEAR

MIN TOW DEPTH

(M)

00000

MAX TOW DEPTH

(M)

00304

MIN TOW DEPTH

(M)

00000

MAX TOW DEPTH

(M)

00010

AT MAX DEPTH

HH

MM

ANGLE

WIRE OUT

1213

45

42

IN

TIME

OUT

HH

MM

SS

HH

MM

SS

121114

121447

IN

TIME

OUT

HH

MM

SS

HH

MM

SS

122625

123634

BONGO ACTUAL BEGINNING COORDINATES

LATITUDE DEG MINUTES

LONGITUDE DEG MINUTES

2958.80

8729.99

NEUSTON ACTUAL BEGINNING COORDINATES

LATITUDE DEG MINUTES

LONGITUDE DEG MINUTES

2958.84

8729.99

BONGO ACTUAL ENDING COORDINATES

LATITUDE DEG MINUTES

LONGITUDE DEG MINUTES

2958.89

8730.07

NEUSTON ACTUAL ENDING COORDINATES

LATITUDE DEG MINUTES

LONGITUDE DEG MINUTES

2958.86

8730.09

FLOWMETER

LEFT METER ID #

RIGHT METER ID #

26524

23258

START

START

335353

039524

END

END

340871

044905

BONGO TOW SPEED (KT)

1.4

2,050 ml jelly

grey

NEUSTON TOW SPEED (KT)

2.4

PRESERVATIVE USED: RIGHT BONGO
FORMALIN (INITIAL) / ETHANOL (FINAL)

PRESERVATIVE USED: LEFT BONGO
ETHANOL (INITIAL) / ETHANOL (FINAL)

PRESERVATIVE USED: NEUSTON
ETHANOL (INITIAL) / ETHANOL (FINAL)

BONGO SEAMAP SAMPLE NUMBERS

LEFT

51837

RIGHT

51838

NEUSTON SEAMAP SAMPLE NUMBER

51839

COMMENTS:

Wire Out: 42 m, _____ ft

Calculated Max Tow Depth = $29.7 = \cos(45) \cdot 42$

Jars: 1 L Bongo 1602
1 R Bongo 1602
1 Neuston 1602

* / drop

w

Orange jelly
white

SEAMAP ENVIRONMENTAL DATA SHEET

Shift Leader Initials JH

VESSEL CRUISE SOURCE

77 1602 AL

PASCAGOULA #

77002

SEAMAP STATION #

B173

MON DAY YR
09 08 16

ZONES
STATISTICAL FAUNAL TIME
10 06 4

WAVE HT. (ft) WIND DEGREES KNOTS STAT. LOCATION PRECIPITATION AIR TEMP (°C) BAROMETRIC PRESSURE (mbar)
00.5 121 8.2 S 0 75.6 1018

SEA CONDITION (BEAUFORT SCALE)

02

DAYLIGHT ONLY:

WATER COLOR

B

% CLOUD COVER

0, 25, 50, 75, 100

SECCHI DISC (m)

15.5

WATER DATA FROM CTD CAST

| | DEPTH (m) | CONDUCTIVITY (RATIO) | SALINITY | TEMPERATURE (°C) | DISSOLVED OXYGEN |
|-----|-----------|----------------------|----------|------------------|------------------|
| TOP | 1.0 | 54.4240 | 32.44 | 29.87 | 6.26 |
| MID | 16.0 | 54.2572 | 32.56 | 29.52 | 6.25 |
| BOT | 32.0 | 54.9866 | 33.95 | 28.24 | 3.90 |

TRANSMISSIVITY

TOP 95
MID 95
BOT 92

CTD Coordinates:

LATITUDE DEG MINUTES

29 58.82

LONGITUDE DEG MINUTES

87 30.02

CTD START

HH MM
12 20

CTD END

HH MM
12 22

FILE ID

CHLOROPHYLL

*FROM LAB (Mg/M³)

SURFACE

MIDWATER

BOTTOM

CHLOROPHYLL

*FROM CTD (Mg/M³)

SURFACE

MIDWATER

BOTTOM

COMMENTS:

Type of CTD used:

SEAMAP PLANKTON STATION SHEET

Shift Leader Initials JH

Page 1 of 2

PASCAGOULA #
77003

SEAMAP STATION #
B177

VESSEL
77

CRUISE
1602

SOURCE
AL

MON DAY YR
09 08 16

ZONES
STATISTICAL FAUNAL TIME
10 06 4

ON STATION TIME

START

END

HH MM

HH MM

1427

1510

PLANKTON ACTUAL BEGINNING COORDINATES

LATITUDE DEG MINUTES LONGITUDE DEG MINUTES
30 00 00 87 57 00

Start
ACTUAL WATER DEPTH (M)

24.3

end: 23.4

PLANKTON ACTUAL ENDING COORDINATES

LATITUDE DEG MINUTES LONGITUDE DEG MINUTES
30 00 46 87 57 30

Sargassum in area? If so, circle one:

Current-driven Windrow, Wind-driven Windrow, Oceanic Frontal Zone (OFZ), Large Mats, Scattered Clumps, Scattered Mats/Clumps along OFZ

GEAR TYPES USED AT THIS STATION (CIRCLE GEAR TYPES USED OR ADD ADDITIONAL GEARS USED):

BG BC PN NN SE CA SX OX TC

SEAMAP PLANKTON TOW SHEET

Shift Leader Initials JH

VESSEL

CRUISE

SOURCE

77

1802

AL

PASCAGOULA #

SEAMAP STATION #

RECORDER (INITIALS)

77003

B177

MON DAY YR
09 08 16

LJ

BONGO

NEUSTON

DEPTH

CODE

03

MESH

NET #

(C/O)

01

GEAR

01

0

DEPTH

CODE

09

MESH

NET #

(C/O)

03

GEAR

02

0

MIN TOW DEPTH

MAX TOW DEPTH

(M)

(M)

00000

00242

MIN TOW DEPTH

MAX TOW DEPTH

(M)

(M)

00000

00010

AT MAX DEPTH

HH

MM

ANGLE

WIRE OUT

1435

45

34

HH

MM

ANGLE

WIRE OUT

1451

15

34

IN

TIME

OUT

HH MM SS
14 32 20

HH MM SS
14 37 04

IN

TIME

OUT

HH MM SS
14 51 15

HH MM SS
15 01 17

BONGO ACTUAL BEGINNING COORDINATES

NEUSTON ACTUAL BEGINNING COORDINATES

LATITUDE DEG MINUTES

LONGITUDE DEG MINUTES

300002

875705

LATITUDE DEG MINUTES

LONGITUDE DEG MINUTES

300002

875699

BONGO ACTUAL ENDING COORDINATES

NEUSTON ACTUAL ENDING COORDINATES

LATITUDE DEG MINUTES

LONGITUDE DEG MINUTES

300002

875710

LATITUDE DEG MINUTES

LONGITUDE DEG MINUTES

300007

875701

FLOWMETER

JELLYFISH PRESENT IN NET?

Y (N) IF YES, AMT (L):

LEFT METER ID #

RIGHT METER ID #

26524

23258

START

START

340875

044909

END

END

348730

052925

SARGASSUM PRESENT IN NET?

Y (N) IF YES, AMT (L):

BONGO TOW SPEED (KT)

1.3

NEUSTON TOW SPEED (KT)

2.1

PRESERVATIVE USED: RIGHT BONGO
FORMALIN (INITIAL) / ETHANOL (FINAL)

PRESERVATIVE USED: LEFT BONGO
ETHANOL (INITIAL) / ETHANOL (FINAL)

PRESERVATIVE USED: NEUSTON
ETHANOL (INITIAL) / ETHANOL (FINAL)

BONGO SEAMAP SAMPLE NUMBERS

NEUSTON SEAMAP SAMPLE NUMBER

LEFT

51840

RIGHT

51841

51842

COMMENTS:

Jars: 1 L Bongo 16 oz

Wire Out: 34 m, _____ ft

1 R Bongo 16 oz

Calculated Max. Tow Depth = $24.0 = \cos(45) \cdot 34$

1 Neuston 32 oz

(2 drops)

Jelly
White
Bongo

grey

40

SEAMAP ENVIRONMENTAL DATA SHEET

 Shift Leader Initials JA

| | | | | | | | | |
|--------------|------------------|--------|------------|--------|-------------|-------|--------|------|
| PASCAGOULA # | SEAMAP STATION # | VESSEL | CRUISE | SOURCE | STATISTICAL | ZONES | FAUNAL | TIME |
| 77003 | B177 | 77 | 1602 | AL | 10 | | 06 | 4 |
| | | | MON DAY YR | | | | | |
| | | | 09 08 16 | | | | | |

| | | | | | | |
|--------------|--------------|-------|----------------|---------------|---------------|----------------------------|
| WAVE HT. (m) | WIND DEGREES | KNOTS | STAT. LOCATION | PRECIPITATION | AIR TEMP (°C) | BAROMETRIC PRESSURE (mbar) |
| 00.5 | 136 | 8.8 | S | 0 | 76.5 | 1017 |

| | | | | |
|--------------------------------|----------------|-------------|--------------------|-----------------|
| SEA CONDITION (BEAUFORT SCALE) | DAYLIGHT ONLY: | WATER COLOR | % CLOUD COVER | SECCHI DISC (m) |
| 02 | | B | 0, 25, 50, 75, 100 | 20.0 |

WATER DATA FROM CTD CAST

| | DEPTH (m) | CONDUCTIVITY (RATIO) | SALINITY | TEMPERATURE (°C) | DISSOLVED OXYGEN |
|-----|-----------|----------------------|----------|------------------|------------------|
| TOP | 1.0 | 52.9758 | 31.66 | 29.58 | 6.28 |
| MID | 13.0 | 52.7346 | 31.70 | 29.28 | 6.22 |
| BOT | 25.0 | 54.9912 | 33.70 | 28.59 | 5.13 |

| | | | |
|----------------|------------------|----------------------|-----------------------|
| TRANSMISSIVITY | CTD Coordinates: | LATITUDE DEG MINUTES | LONGITUDE DEG MINUTES |
| TOP: 95 | | 30 00 03 | 87 57 03 |
| MID: 96 | | 30 00 03 | 87 57 03 |
| BOT: 93 | | | |
| | CTD START | CTD END | |
| | HH MM | HH | MM |
| | 14 43 | 14 | 45 |

FILE ID _____

| | | | |
|--|---------|----------|--------|
| CHLOROPHYLL *FROM LAB (Mg/M ³) | SURFACE | MIDWATER | BOTTOM |
| | | | |

| | | | |
|--|---------|----------|--------|
| CHLOROPHYLL *FROM CTD (Mg/M ³) | SURFACE | MIDWATER | BOTTOM |
| | | | |

COMMENTS:

Type of CTD used:

APPENDIX 13: FLOWMETER PERFORMANCE TRACKING FORM

Project: SEAMAP Ichthyo CRUISE: 1602

| PASCAGOULA STATION NO. | SERIAL NUMBER | POSITION (Left or Right Bongo) | FLOWMETER COUNTS | | | TOW DEPT H | TOTAL TOW TIME | COUNTS/MINUTE |
|------------------------|---------------|--------------------------------|------------------|--------|-------|------------|----------------|---------------|
| | | | START | FINISH | TOTAL | | | |
| 77001 | 26524 | Left | 331809 | 335317 | 3508 | 12.0 | 2.13 | 1646.9 |
| 77001 | 23258 | Right | 036116 | 039488 | 3372 | 12.0 | 2.13 | 1583.1 |
| 77002 | 26524 | Left | 335353 | 340871 | 5518 | 29.7 | 3.55 | 1554.4 |
| 77002 | 23258 | Right | 039524 | 044905 | 5381 | 29.7 | 3.55 | 1515.8 |
| 77003 | 26524 | Left | 340875 | 348730 | 7855 | 24.0 | 4.73 | 1660.7 |
| 77003 | 23258 | Right | 044909 | 052925 | 8016 | 24.0 | 4.73 | 1694.7 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Counts = Actual numbers read on flowmeter.

