

## NADP Mercury Litterfall Network (MLN) Site Operator Instructions

### 1. Study plot location

The NADP site sponsor and site operator will consult with the NADP site liaison when selecting the location for the forest study plot to assure it is representative of the forest land cover near the NADP Mercury Deposition Network (MDN) or Atmospheric Mercury Network (AMNet) site. The center of the sample plot should be less than 300 m (984 ft) from the MDN or AMNet collector. The study plot should have the same tree species and tree age as most of the forest land around the NADP site.

For example (figure 1), if the majority of the natural forest land cover in the vicinity of the site is deciduous oak-hickory forest, but a stand of planted white pine is also nearby, the forest study plot should be located in the oak-hickory forest, not the white pine stand. Similarly, if the majority of the natural forest land cover in the vicinity of the site consists of mature trees that are mostly greater than 12 inches in diameter at eye level, but a stand of immature trees of the same species that are mostly less than 4 inches in diameter at eye level is also nearby, the forest study plot should be located among mature trees, not in the stand of immature trees. The forest study plot should be located where it is unlikely to be disturbed by foot and vehicle traffic and should be away from game trails.

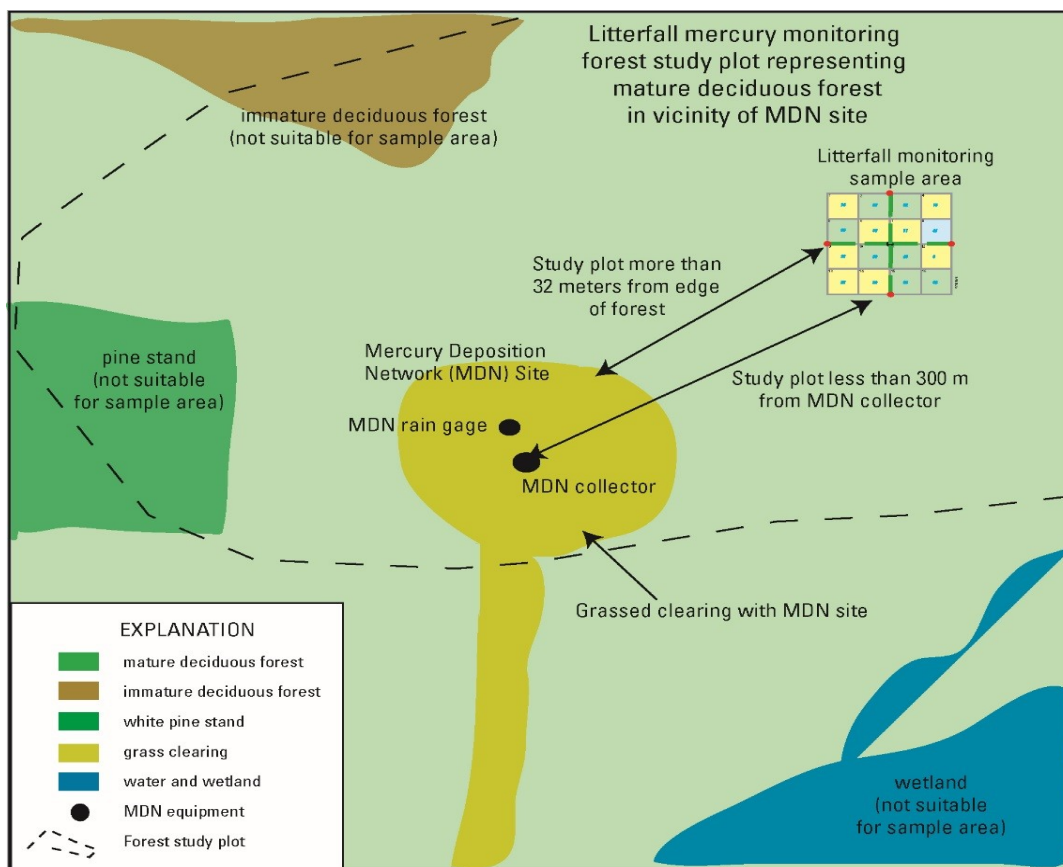
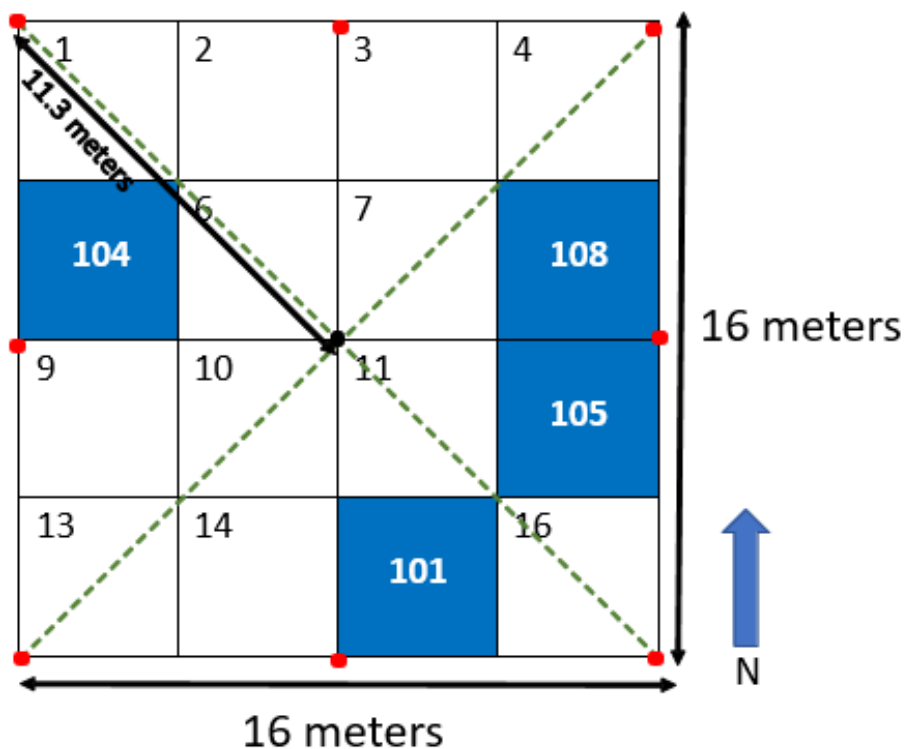


Figure 1. Example of forest study plot at an NADP site.

## 2. Sample Area

The 4 litterfall collectors will be deployed in a 16-m by 16-m sample area within the forest study plot. The collectors will be deployed in 4 of the 16 cells in the sample area (figure 2). A random selection method will be used to determine which of the 4-m by 4-m cells will receive the collectors. Designation of collector locations will be shared with site operators each year ahead of the litterfall season.



Note that the sample area should be more than 32 m from the edge of the forest study plot and should not include a creek, gully, ravine or other feature of uneven terrain. It should be an area with relatively homogeneous terrain.

**Figure 2.** Diagram of litterfall sample area with example collector locations marked in blue.

1. Select center point of sample area.
2. Stretch 11.3 -m line to corner of area and set a flag.
3. Repeat step 2 for other three corners of area and set three more flags.
4. Estimate the middle of each side of the plot and set four more flags.
5. Consult diagram of sample area plot. Orient top of diagram north. Find blue cells selected for installation of litterfall collectors.
6. Estimate the location of the blue cells in the sample area, based on flag placement. Deploy collectors.
7. If the area is obstructed in a cell, move collector to nearest adjacent unoccupied cell.

### 3. For first time site participants

Supplies are included in the sample kit for defining the sample area boundaries, consisting of 11.3 m pre-measured line on two stakes, plus 8 marker flags. Site operators should keep these flags and stakes at the site at the end of the season for marking the plot in the next season. Pick the center of the sample area, such as a prominent tree that can serve as a future reference mark. Using the full length of the 11.3-m (37-ft) line and 4 flags, mark the corners of the sample area. Then mark the distance from the center of the sample area to the middle of each side by using the 8 m distance labeled with a ribbon on the line. Use the remaining 4 flags to mark the middle of the 4 sides of the sample area. For a plan view of the sample area, refer to [figure 2](#)

### 4. Sample collectors

The 4 litterfall collectors are intended to passively falling to the forest floor. Each collector consists of a plastic mesh crate lined with a fine mesh net. The size is 0.25 m<sup>2</sup> and has 17.8 cm side walls. Each sample has a unique ID number marked in several places.

### 5. Placement of sample collectors

The locations for the 4 sample collectors in the sample area are randomly selected for each forest study plot. Site operators will receive a spreadsheet each year with the assigned random number list for their site. The columns in the spreadsheet are labelled 1-4, which correspond to the sequence of collector numbers from lowest to highest.

[Figure 2](#) shows an example where the collector number sequence is 101, 104, 105 and 108. The 101 collector is located in sub-plot 15 and the collector 108 is located in sub-plot 8. Typically, a collector will be placed somewhere within the assigned cells using observational judgement based on stake flag locations to properly locate the collector. A collector should not be placed in a cell if thick understory or fallen limbs would obstruct litterfall from entering the collector or if the terrain would prevent the collector from sitting level. Use the nearest unoccupied cell in these cases. Typically, the litterfall collectors are deployed on a Tuesday. Complete block 6 of the field form included in the kit at the time the collectors are deployed.

### 6. Sample collection

Litterfall samples will be retrieved once every 4 weeks on a Tuesday. Depending on the latitude and altitude of the NADP site, the length of the litterfall sampling season will require that samples will be collected 2 or more times at 4-week intervals until the leaf drop ends.

- a. The sample kit contains a pre-assigned shipping pouch for each 4-week retrieval. Each pouch has a sample field form, a set of gloves, and 4 ziploc bags.
- b. The ziploc bags have been pre-label with the ID numbers that correspond with the numbers on the litterfall collectors at the site.

- c. One pouch and its 4 sets of bags are needed to collect one 4-week litterfall sample from the 4 collectors. The site ID and retrieval number is labeled on the pouch (#1 for the first 4-week sample, #2 for the second 4-week sample, etc).
- d. Take the appropriately labeled ziploc bags and the gloves to the sample area. Match the collector number to the label on the bag.
- e. Empty the contents of the collector into the ziploc bag using a gloved hand to transfer the litterfall.
- f. Put the empty sample collector back in its cell in the sample area. Expel the air from the ziploc bag and seal firmly. Wet litterfall samples can be submitted.
- g. Avoid including substantial amounts of frozen precipitation or sticks greater than ~1/2 cm in diameter. **Figure 3** has a series of photographs showing the sample collection procedure.



**Figure 3.** Sample Collection procedure



1. Select the appropriate retrieval pouch and match the bag label to the bin ID.
2. Empty the contents of the collector into the ziploc bag using a gloved hand to transfer the litterfall.
3. Expel the air from the ziploc bag and seal firmly.
4. Place the sealed ziploc bags in the pouch for return shipment.


## 7. Sample field form

A sample field form, included in the kit, should be used for recording information about each of the 4-week litterfall samples. Include a copy of the completed form with each set of samples shipped to NADP. See [Figure 4](#).

## 8. Shipping

The cost for shipping samples is the responsibility of the site sponsor. Whether they are empty or contain litterfall, place the 4 ziploc bags in the pouch. After each set of 4-week litterfall samples are collected, ship the pouch of 4 ziploc bags and field form to the address below. This address should be pre-labeled on the sampling pouch. Alternatively if there is a collocated MDN site, the pouch can be shipped in the MDN cooler box.

NADP Sample Receiving  
 465 Henry Mall  
 Madison WI, 53706



**MERCURY LITTERFALL NETWORK (MLN)**  
 Send Completed Form with Each Sample Set to:  
 NADP Sample Receiving  
 465 Henry Mall, Madison, WI 53706

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**1. SITE**  
Name \_\_\_\_\_

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|--|--|--|--|

ID

**2. OBSERVER**  
Print name \_\_\_\_\_

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|--|--|--|--|

Initials

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**3. SAMPLE START AND END**

Date

| MO | DAY | YR |
|----|-----|----|
|    |     |    |
|    |     |    |
|    |     |    |

ON

OFF

4-Week Sample

1<sup>st</sup>

2<sup>nd</sup>

3<sup>rd</sup>

4<sup>th</sup>

5<sup>th</sup>

**4. LITTERFALL CONDITIONS** *Please check condition of Litterfall in each sample.*

| COLLECTOR ID | Wet | Moist | Dry | Empty |
|--------------|-----|-------|-----|-------|
|              |     |       |     |       |
|              |     |       |     |       |
|              |     |       |     |       |
|              |     |       |     |       |

**Wet** = drops of liquid can be released from sample

**Moist** = sample is not dry and does not release liquid


**Dry** = sample is not wet or moist

*Estimate percentage of autumn leaf drop before collectors were deployed: \_\_\_\_\_%*

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**5. TREE SPECIES**  
*List tree species in sample area with most abundant first.*

**6. COLLECTOR LOCATIONS**  
*Indicate the collector ID #'s in the plot diagram.*

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**7. REMARKS**  
*Comments about sample condition, recent precipitation, empty collector, etc.*

**Questions? Call 1-800-952-7353 or E-mail [litterfall@slh.wisc.edu](mailto:litterfall@slh.wisc.edu)**

White Copy: Return to HAL

Blue Copy: Retain for Your Records

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**Figure 4.** Image of sample field form