# Night Duration Measurements and Uses

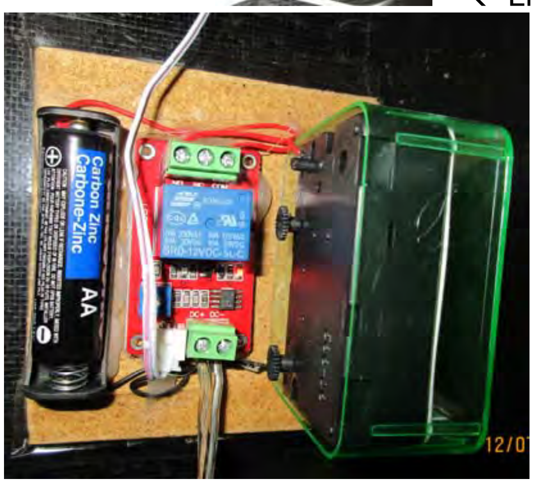
(2/7/2017)

A quickly constructed night duration measuring timer circuit can be used to help indicate when the earth slows down and stops rotating near pole shift time. The days will get longer. The sun rise and set times will fall later and later in the day as the earth slows down. The last day could stop at night or during the day.

After the pole shift, once rotation is back, this timer circuit can be used to indicate the new latitude one is at. It can be used to find the seasons (shortest and longest days). It can be used over the years to help indicate how fast the overcast skies are clearing and when to plant to grow. It can be used to find the brightest time of the day. Solar noon may not be the brightest time of day. Burn off of water vapor overcast could still be going on in the afternoon time.

This unit is not for the common man but for the technically inclined that has the time after solving basic survival needs. It could also help ones group-community and the future humans understand what happened after this pole shift in terms of density of cloud cover.

← Light Sensor




← Wire to 12V Battery and charger

My test unit was taped to a sliding glass door to a back porch shaded by lots of trees. The Lux hitting this porch ranged from 55 in the day to 0.1 at night. The unit was adjusted to turn on and off around 0.4 Lux. There is about 80 times less Lux hitting the sensor than comes from measurements at 45 degrees north from straight up at the sky on a normal partly cloudy days. This indicated it should work down to very dark overcast environments as would be the case after a pole shift.

## How to make it:

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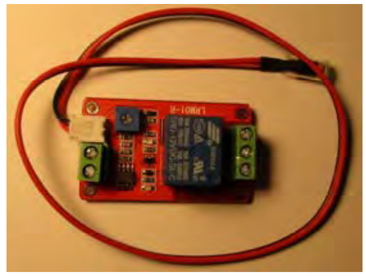
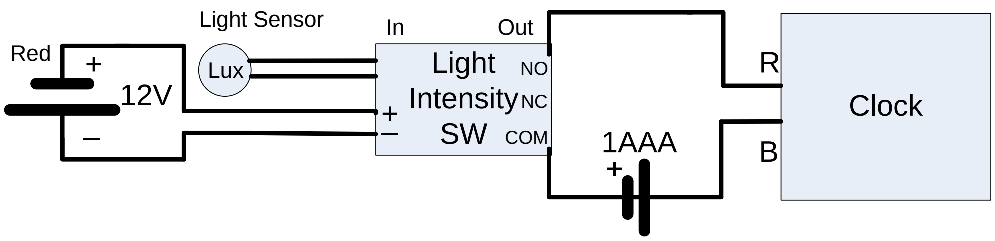
A **DC 12V Adjustable light sensor switch photoresistor control relay module on/off** was purchased from eBay.  It looks like the following with a cost about $7.00.






Sunset, Sunrise Timer Wiring

The unit will adjust to turn on with below 1 Lux to above 15,000 Lux.  Depending on the version purchased the sensor can measure down below .1 Lux.  When the solenoid is on it uses 34 ma and when off 3.8ma.  The unit tested was a LRM01-R rendition from eBay. The model LCRM01 measures the same on input current but will go to will below.1 Lux at its low end by a ¼ turn on its adjustment pot and is the best to get.  The clock is a common $1.00 store or eBay single AA battery quarts clock.   A 3"x3.25"x1/8" peace of press board was cut to hold the individual parts.   Hot melt glue gun was used to attach the 3 objects to the cut peace of press board.  Stiff cardboard or thin plywood would have worked just as well.  Any 12 volt battery or gel cell will work. A trickle charger was used on this battery during operation to keep it charged.

### How to use this timer to measure dark or night time duration:

In practice when the unit turns on at sunset the solenoid will chatter (buzz) for about 1-2 sec.  It can be heard within the same room and can be used as an alarm to indicate that the trigger to darkness or to light has occurred.  This time can be written down as sunset or sunrise time.  At sunset the clock turns on and starts measuring dark duration.  At the next sunrise the solenoid turns off and the clock is left with the time on it that will need to be written down and the clock reset to 12:00 before the night sunset.  A log should be kept. A sample log will be discussed later in this report.

At times with wind blowing or moving overcast the timer will buzz several times near a sunset or sunrise possibly up to 10 minutes apart. During these occasions one can log the cumulative clock reading by waiting until a bit later on.

I was using a Lux meter with a 3.5” long cut off plastic vitamin bottle to limit the cone angle of view to about 30 degrees. This caused the light intensity measured to vary when clouds or overcast was in motion. Then the cone was changed out to use 45 degree angle of view. This helped minimize intensity changes with the cloud motion. See the following, it shows the 30 degree 3.5” shield.


After the pole shift when this timer is implemented it is recommended to use a much bigger angle of view. This will to a greater degree average out moving clouds and overcast. This can be done by cutting down the length of the bottle shield. One should set up the sensor on the timer with the same angle of view of the sky in the same direction. Avoid any local light source entering the cone of measure.



The 45 degree viewing light shield above measured 2.25” and the 30 degree angle of view measured 3.5” high with an added .25” to the sensor this gives what was marked in the pictures above as 2.5” and 3.75”.

**Calibrating on off times before Pole Shift:** Pick an average (to simulate after PS) morning or night and using the looked up times for the give date for sunrise or sunset (see reference at the end of this report) adjust the unit to just go off or on at that time of the day.

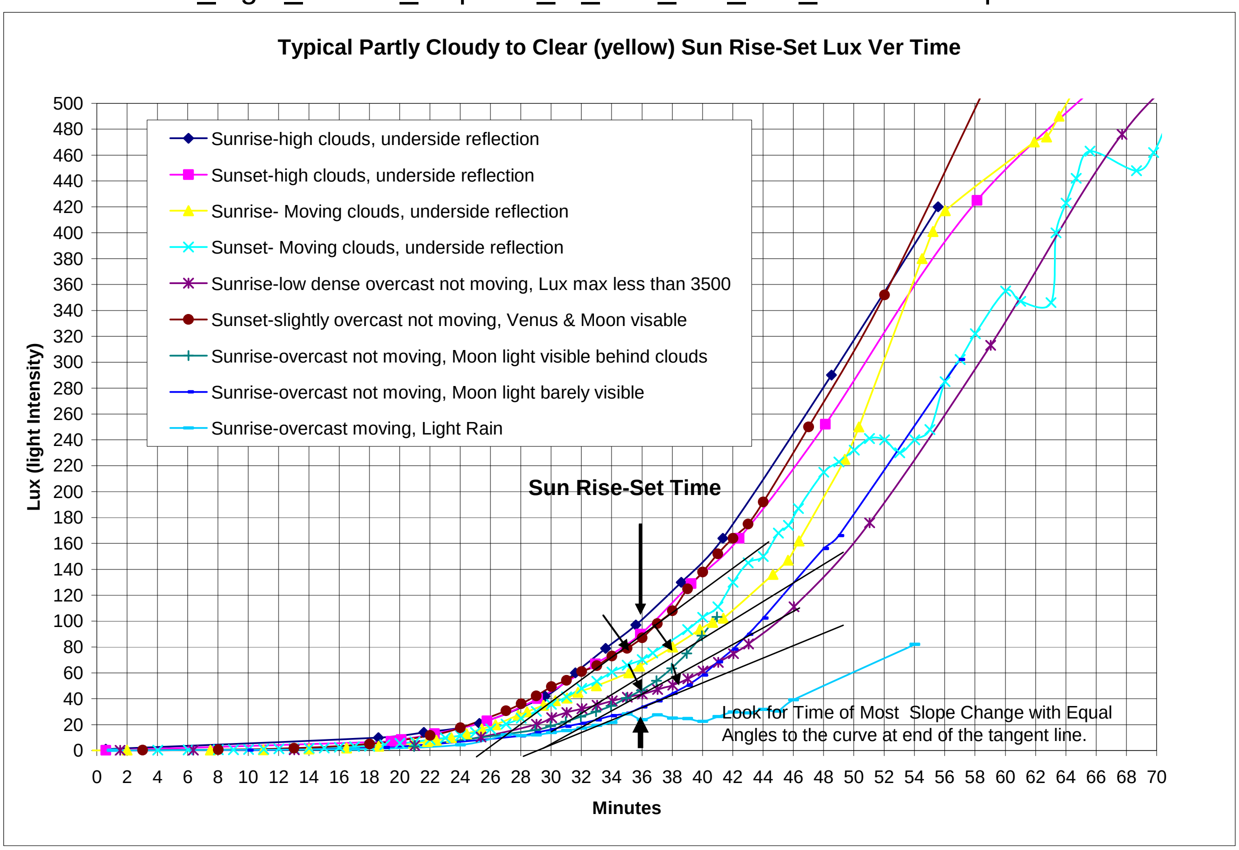
Calibrating on off times after the Pole Shift: How does one determine sunrise and sunset time accurately after the pole shift where one cannot see the sun and the sky is constantly heavily overcast? The following measurements of sunset and sunrise times, shows the relationship of the type of curve one can expect and the needed trigger point (at this case of 36 min). The light intensity or Lux meter was aimed about 45 degrees to the north from straight up in the sky, with readings taken every few minutes. The timer sensor could be straight up to get both sunrise and sunset. If very low light level is the case one may aim the light meter directly at the sun rise or set to get the readings and curve needed. Two photo resistors (GL5506 LDR or better as example) can then be wired in series with one pointing toward the rise and the other pointed at the sun set. The blocking shielding would take into account ground level lighting that might alter the readings.

The resistance value of max dark or relay closing-opening is near 107 K-ohms. The sensor that comes with the better of the units will measure to a lower Lux than the best photo resistor that I could find to purchase (GL 5506) by a factor of about 3x ohms.

**How does one find the new sun rise or sun set position on the horizon after the pole shift**? At sun rise or set, a light meter with a narrow cone angle of view, can be used to find the point on the horizon that provides the maximum light intensity. Use this to point your timer sensor at.

The measured light intensity curves shown below were shifted around on the X axis until the sun rise or set points from publish expected times lined up with each other over a few days of measurement. The trigger point was obtained from a GPS showing sunrise time of the day for that latitude. These measurements were done will before the pole shift. Note the different shapes of the curves due to different weather conditions.

Before the pole shift the Lux light intensity at the trigger point of sunrise or sunset ranged from 20 to 100 Lux. After the pole shift it could be 100 times less or .2 to 1 Lux. Have a .01 Lux capable meter available incase this is the case. See "Recomended_Light_Meters_Capable_of_Low_Lux_and_UVC-2017. pdf"



With more cloud cover this would act as a filter and would decrease the intensity of light for this same time period. It would not likely change the shape of the curve assuming one has chosen a day where cloud cover is stable and no storms are building or dissipating and not much wind is blowing. This could be well after the pole shift once things settle down into a norm. If the wind is blowing then any clouds will be moving and this could cause variations in intensity as shown in light green and yellow curves above.

Note from the graph above done before the pole shift indicates that the denser the overcast the lower the Lux at sunset-rise, the curve gets shaper and with a more pronounced bend. This might make it easer to find the tangent point of high change. Note that the tangent under higher overcast conditions can shift to 2 min after the desired trigger point. Since sunrise and sunset is given only to the nearest minute this is not surprising and will not affect the found latitude very much.

If one had a Lux meter that is capable of measuring to a 0.01 Lux then one could plot a current curve and find the point of maximum slope change and the resulting intensity and then the next day set the timer to turn off or turn on at that Lux or time of day (trigger time doesn't change much daily). This assumes one measures and plots points to about 10-30min after the most change in slope point and measures light intensity down to 0.01 Lux or lower.

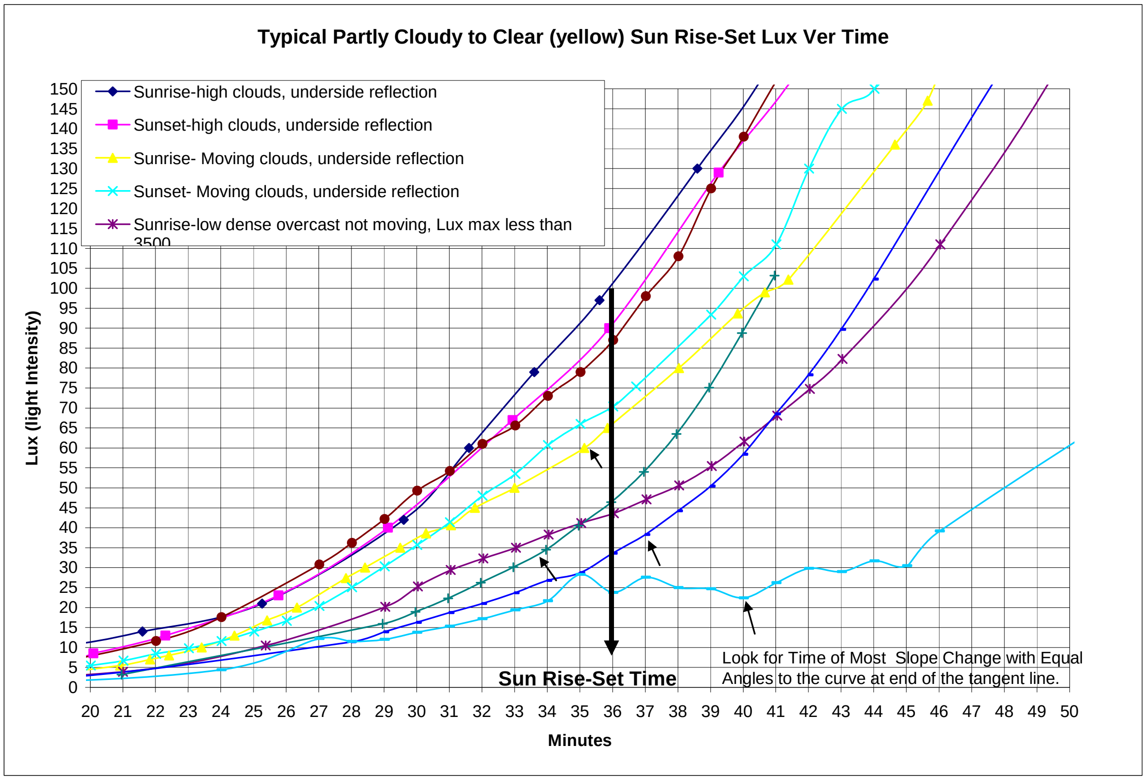
It is a mater of physics that the sun takes 2.12 min to rise or set or to traverse a straight line tangent to the horizon. Due to diffraction and reflection off the atmosphere, clouds, and latitude, this can take a number of minutes or to make the maximum slope change. After identifying the length of the curve at this max change time frame, one needs to find the center of this curve using several days of measured data and the graph above. A line drawn tangent to the curve should have equal angles well away on each side of the point chosen. Toss out any data where there are lot of bumps due overcast motion.

Sunrise is easier to measure. It starts out dark and once light enough to start measuring then a typical watch or count up type timer can be used. Write down the Lux reading every few minutes. The higher the earth latitude one is at the longer the readings need to be taken for the curve is more genital. The above was taken at earth latitude 57 degrees.

The starting-stopping Lux adjustment might need to be changed as time progresses and the sky's begins to clear. Thus one should keep track of the Lux at the equivalent of solar noon time over time. Solar noon would be half way between sunrise and sunset times. One could take a reading of solar noon Lux once a month or once every week for a while to see how the light intensity at solar noon is changing. This could be plotted on graph paper. Days with stormy skies would be skipped or noted as such.

Some my reset from time to time their local clocks to sink with solar noon. This will all depend on whether the new after pole shift day is the same duration as the pre-pole shift day.

After plotting the curve if you find a lot of bumps in it, this is due to the overcast moving. Recommend skipping days with lots of wind. One can also use a bigger cone angle on the light meter and aim straight up. This will tend to average out the bumps in the curves. The point is one can't trust curves with lots of change in it with time. Skip these when doing your calculation of set intensity.




Once one can estimate the time frame of rise or set then one can one narrow down the time the measurements are needing to be taken to say at 15min before and 15min after sunset and plot only that as shown above.

 <0.4  <0.6  <1.6

The above pictures are provided to give an indication how dark low-Lux is. The start and stop trigger points could be this low after the pole shift. Recommend purchasing a good Lux meter that is capable of .01 Lux as a minimum.

A Lux meter would also be useful in determining when there is enough light to grow food. One could use sunlight or artificial light or a combination. Generally speaking 15 watt/sq. ft lighting with in 12-15 inch of the plant is a minimum for interior plant growth lighting. The more watts/sq. foot of full spectrum light, or preferably heavy on UV and red one can afford to produce, the better the plant growth. It is impractical due to cost to produce any where near the intensity of the sun using artificial light.

Tests of 14 watt LED flood lights spaced 1 foot apart (14w/sq.ft) produces at 1 foot away between 6,000-11,000 Lux. Tests of 10 watt LED round bulbs spaced 1 foot apart (10w/sq.ft) produces at 1 foot away between 3,000-4,000 Lux. The range is depending on whether the measurement is taken equal distant between 4 light sources to directly below a single light source. Incandescent tungsten lighting is about 8-10 times less Lux than for the same wattage of LEDs.

The interior of a well-lighted home is between 200-1000 Lux, while outdoor light intensity on a clear sunny day may exceed 120,000 Lux. A typical overcast days maximum is between 1,000 to 3,000 Lux. Plants differ greatly in their light intensity requirements. Indoor plants are often classified by the amount of light necessary for growth. One Lux = .0929 footcandles.

- Low -- minimum 1,000, 750 to 2,000 Lux preferred for good growth
- Medium -- minimum 1,000 to 1,500, 2,000 to 5,000 Lux preferred
- High -- minimum 1,500 to 10,000, 5,000 to 10,000 Lux preferred
- Very high -- minimum 10,000, 10,000+ Lux preferred

See “How_Much_Light_is_Needed_to_Grow_Food_After_a_Pole_Shift-2016.pdf”

## Analysis of measurements:

The logging of measurement in a excel spread sheet could look like this. One could take readings daily for intervals of time. The following is how this log might look in excel.

**Daylight and Night Timer Sensor Log**

| | *Log next daylight* | | **--------- Log after Dark ---------** | | | **-------- Calculated Automatically --------** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Date | Sunrise weather | Log Time & Reset to 12:00 | Time of Day | time on running timer | Sunset weather | Sunrise Time | Sunset Time | Daylight Duration | Night Duration | Abbreviations |
| 1-Sep-16 | sun | xxxxxxxxxx | 5:04:11 PM | 12:20:00 AM | sun | 6:31 AM | 4:44 PM | 10:13 | 13:47 | O=overcast |
| 2-Sep-16 | sun | 13:47:00 | 4:48:00 PM | 12:04:00 AM | sun | 6:37 AM | 4:44 PM | 10:07 | 13:53 | C=clear |
| 3-Sep-16 | sun | 13:53:00 | 5:14:13 PM | 12:40:00 AM | R | 6:36 AM | 4:34 PM | 9:58 | 14:02 | P=partly cloudy |
| 4-Sep-16 | R | 14:02:00 | 5:10:34 PM | 12:26:00 AM | C | 6:33 AM | 4:44 PM | 10:11 | 13:49 | D=cloudy |
| 5-Sep-16 | sun | 13:49:00 | 4:47:30 PM | 12:02:00 AM | C | 6:33 AM | 4:45 PM | 10:12 | 13:48 | R=rain |
| 6-Sep-16 | sun | 13:48:00 | 4:48:23 PM | 12:02:00 AM | C | 6:34 AM | 4:46 PM | 10:12 | 13:48 | S=stormy |
| 7-Sep-16 | sun | 13:48:00 | | | | =(C11+H10) | =D10-E10 | =1-J10 | =TIME(C11*24,((C11*24)-INT(C11*24))*60,0) | Sun=Sun |
| 8-Sep-16 | | | | | | =(C12+H11) | =D11-E11 | =1-J11 | =TIME(C12*24,((C12*24)-INT(C12*24))*60,0) | |

See the sample template file.
“Daylight_and_Night_Duration_Timer_Sensor_Log_Template-2017.xls”

Use of the daily log above: In the morning after the timer has turned off at sunrise make note of any sky conditions at sunrise and write down the time on the timer. Then reset the timer back to 12:00. If one forgets this then the time gets added to the next day. After sunset write down the time of day and if the buzz start time was missed then look at the now running timer clock and write this down. Note the sky conditions. This will be used to calculate the sunset times. Once the values are typed into the spread sheet the sunrise and sunset and duration of light and dark times will be automatically calculated.

The “Solar Noon Lux Log” is also in the template file above. This Can be used to keep track of the light intensity at solar noon or within a half hour of noon time.

The average daylight time over a few days can then be looked up in the “Day_Length_for_Various_Latitudes-2016.pdf” file to give the estimated latitude. Use interpolation as needed. If one finds out one is in the northern hemisphere and North latitude is found then the night time duration readings should match the latitudes found in the table for same south latitude. The latitude found for several times though out the year averaged would then give a pretty accurate result.

The data from the timer log can also show the increase in average daylight time/year. This assumes the same days each year were measured to compute this.

By measuring the light intensity (at solar noon) from the Sun through the cloud cover at various times per year can lead to the following useful understandings.

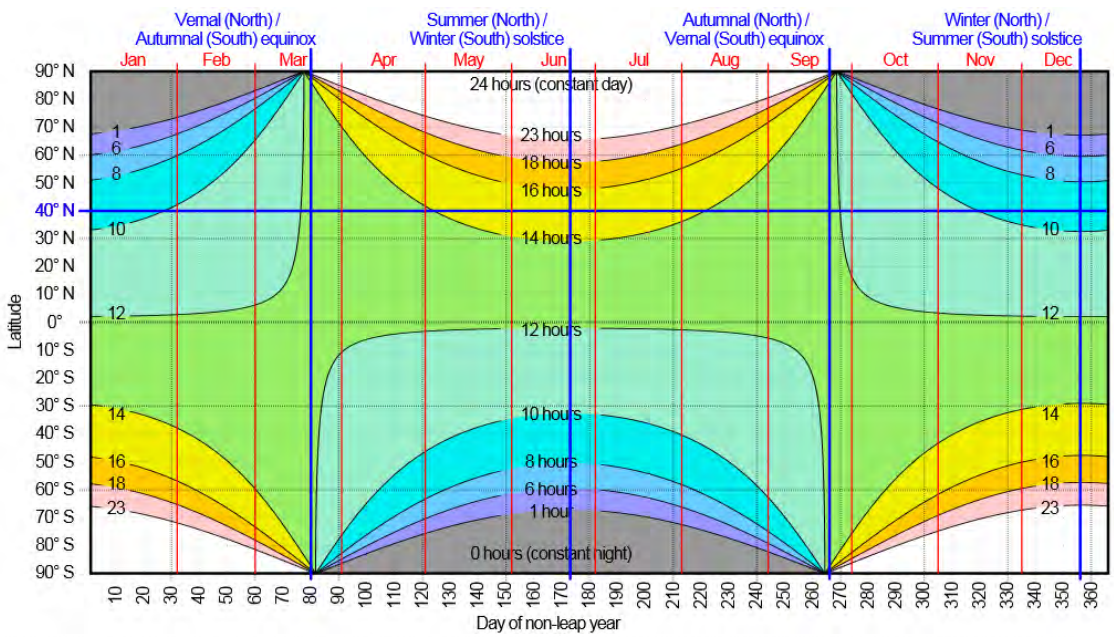
- Discovery of the longest and shortest days of the year that indicate when the seasons start.
- The length of a current earth year.
- How fast the overcast is dissipating. Change in intensity over time.

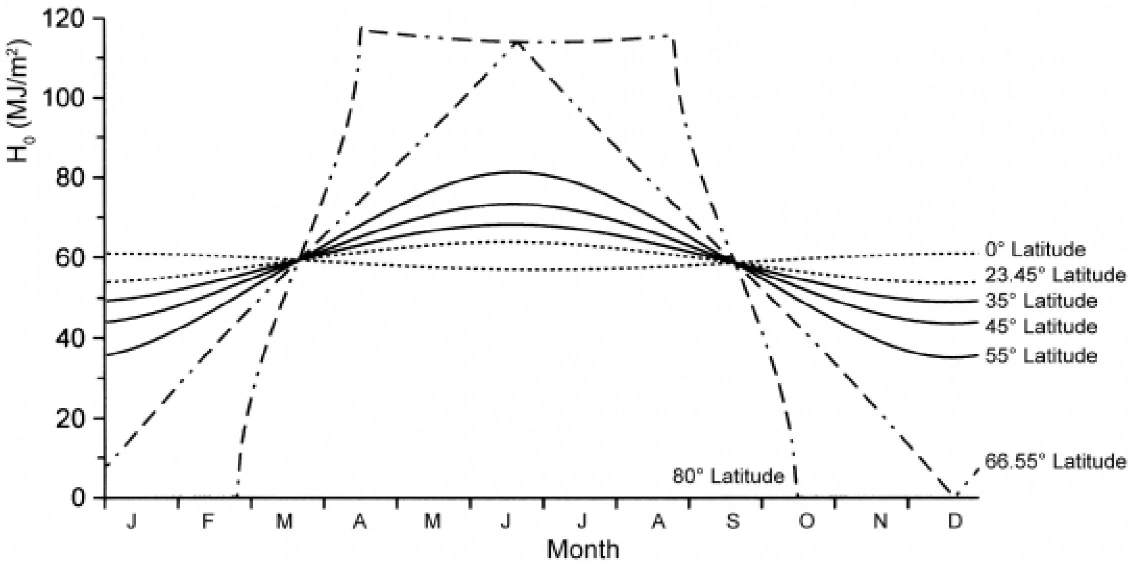
Solar noon is half way between sunrise and sunset. Readings taken several times per week or month is all that needs to be collected over time. The Zetas have said it would take up to 25 years in some places, depending on whether down wind of volcanic activity. So taking intensity reading can go a long way to understanding if one needs to move or not. The following is how this table might look.

| Date | Time | Solar Noon Lux | Comments on weather |
|---|---|---|---|
| 1-May-17 | | | |
| 2-May-17 | | | |
| 3-May-17 | | | |
| 4-May-17 | | | |
| 5-May-17 | | | |
| 1-Jun-17 | | | |
| 2-Jun-17 | | | |
| 3-Jun-17 | | | |
| 4-Jun-17 | | | |
| 5-Jun-17 | | | |
| 1-Jul-17 | | | |
| 2-Jul-17 | | | |
| 3-Jul-17 | | | |
| 4-Jul-17 | | | |
| 5-Jul-17 | | | |

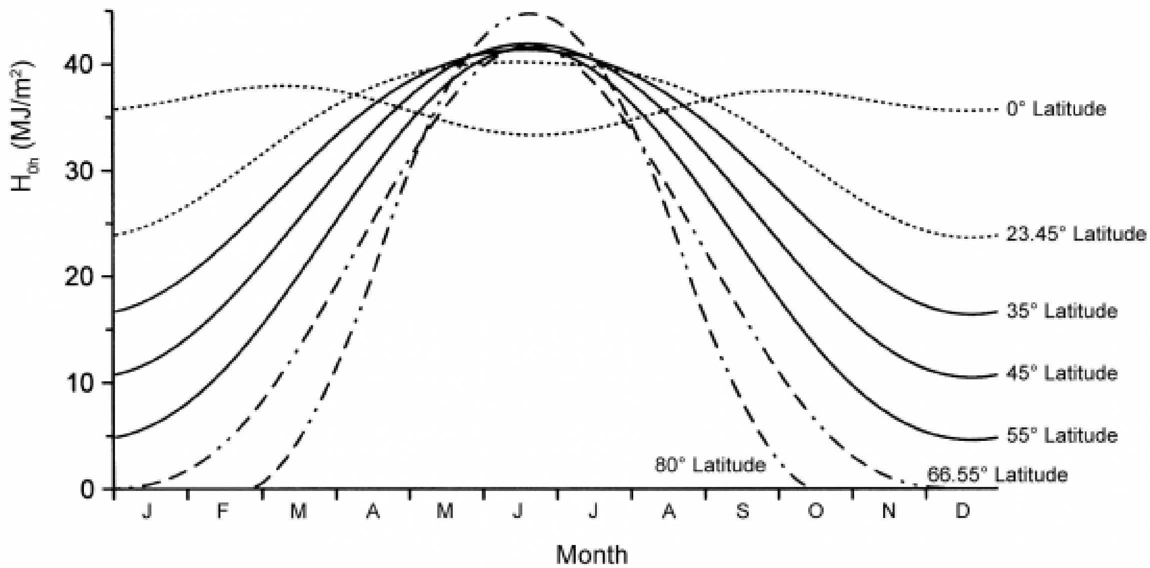
**Highly useful related reports found on this site near where this report is found**

- "Recomended_Light_Meters_Capable_of_Low_Lux_and_UVC-2017.pdf" Purchasing a Lux meter that can measure down to 0.01 Lux or make your own.
- "How_Much_Light_is_Needed_to_Grow_Food_After_a_Pole_Shift-2016.pdf" for how much light is needed to grow food.
- Daylight_Time_Vers_Latitude-2016.pdf This table becomes usefully after the pole shift for latitude determination of where one ended up.
- Day_Length_for_Various_Latitudes-2016.pdf This table becomes usefully after the pole shift for latitude determination of where one ended up.
- Typical_LUX_Intensities_for_Day_and_Night-2016.pdf
- Twilight-Described-2016.pdf



The above is measured with the sensor perpendicular to the suns rays.




The above is measured with the sensor horizontal or parallel to earth's surface.

**Useful Reference Links:**

Day Length for Various Latitudes.  This table becomes usefully after the pole shift for latitude determination of where one ended up.
https://orchidculture.com/cod/daylength.html

Daylight - Wikipedia
https://en.wikipedia.org/wiki/Daylight

Daytime - Wikipedia
https://en.wikipedia.org/wiki/Daytime

Twilight - Wikipedia
https://en.wikipedia.org/wiki/Twilight

See a graph of sunrise, sunset and daylight times for a particular location.  If one saves the files as .CSV or excel (from icon upper right corner) they become very useful for building a table that can be compared to measurements.  The city can be chosen and then open "specifications" link to be able to change latitude and longitude to get more exact results.
https://ptaff.ca/soleil/?lang=en_CA

DURATION OF DAYLIGHT/DARKNESS TABLE FOR ONE YEAR
http://aa.usno.navy.mil/data/docs/Dur_OneYear.php

Solar Energy Reaching The Earth's Surface
http://www.itacanet.org/the-sun-as-a-source-of-energy/part-2-solar-energy-reaching-the-earths-surface/