



# MONT-MÉGANTIC INTERNATIONAL DARK-SKY RESERVE

2015 ANNUAL REPORT

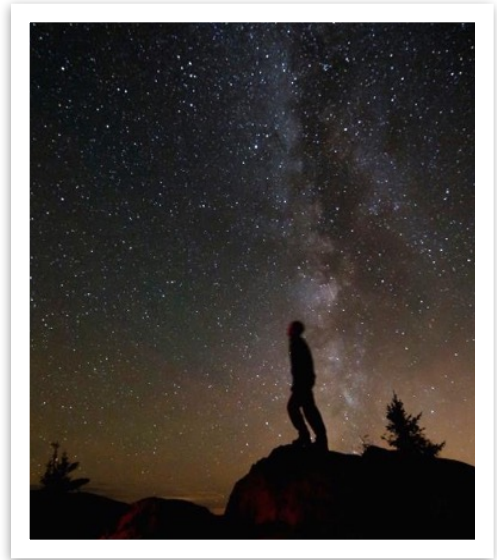
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## Summary

Eight years ago this fall, the first IDA International Dark Sky Reserve was created in Quebec, Canada. Officially certified in September 2007 by IDA (International Dark Sky Association) and RASC (Royal Astronomy Association of Canada), the Mont-Mégantic International Dark Sky Reserve (MMIDSR) covers a territory of 5,300 km<sup>2</sup>, including two RCMs (Regional County Municipalities) as well as the City of Sherbrooke. It unites 35 municipalities and over 225,000 citizens.

A lot of action took place in the reserve in 2015. On the outreach level, a joint project with the tourism regional department and other local organisations led to the installation of many exhibits and banners on the reserve's territory, in order to increase its visibility and the sense of belonging of the population. The ASTROLab visitor center and the Mont-Mégantic National Park saw 15% increases in their attendance (preliminary data), and a new website was put online.



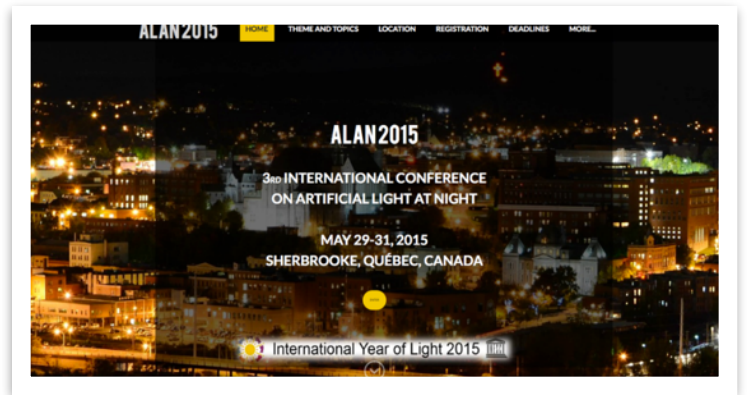
On the regulatory side, the reserve participated in two important provincial projects (state level). The production of an eco-lighting training program for municipalities and the establishment of a Quebec wide light pollution standard. We also put the emphasis on the decision of the city of Lac-Mégantic to go forward with pc-amber lighting for the re-construction of its downtown area. The Reserve's counselling was critical with this decision. On the local scene, the reserve also assisted many towns and villages with the interpretation of the regulation for lighting projects.

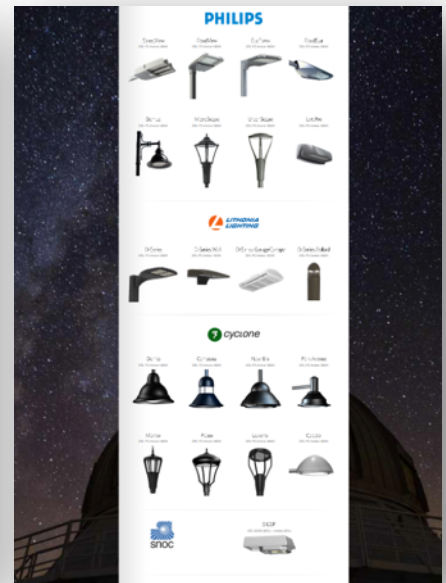
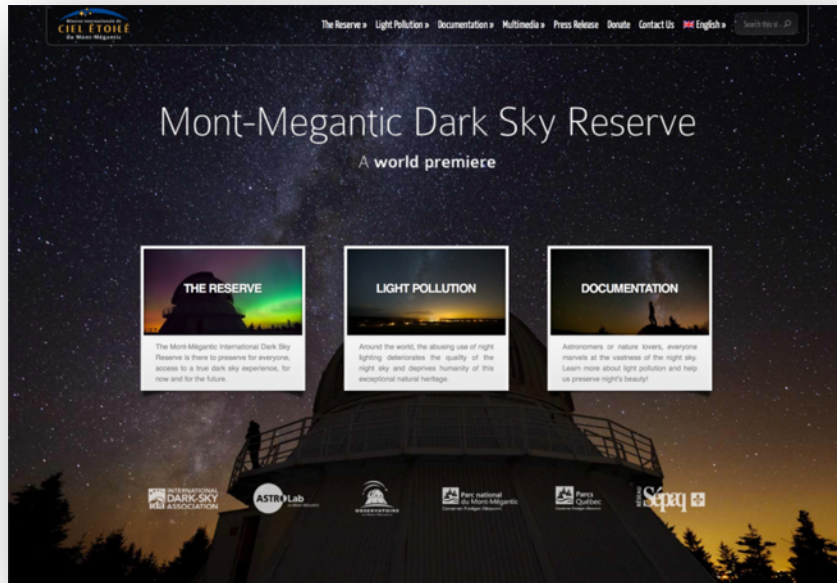
2015 was also an important year on the lighting conversion ground, with more pc-amber installations on the territory. Among them, the city of Sherbrooke (population: 200,000) also continued the deployment of 1,5% blue content pc-amber lighting on its territory. Still, the deployment of white LED lighting around the reserve represent a challenge to be met.

## Outreach

- Production and deployment of 128 banners in the municipalities of the Reserve
- Deployment of 10 banners in the Reserve's touristic stops (the «summits road»)
- Production of 10 interpretive signs for the Reserve's touristic stops
- Design and counselling for the production of 3 majors exhibits for the Reserve's touristic stops :
  - A sundial for Woburn's rest area
  - A giant star finder for Stornoway's touristic halt
  - A 3D Big Dipper constellation for Notre-Dame-des-Bois rest area
- Previous projects were funded by regional development and touristic grants
- More than 20,000 people participated in the ASTROLab's astronomy outreach program at Mont Mégantic
- More than 70 000 visitors in the park, at the heart of the reserve
- ASTROLab's Facebook page : 700 000 reach, 1,7M views
- Design and production of a new website : [www.ricemm.org](http://www.ricemm.org)
- Design and production of an astronomy & light pollution activity that has been held in all Quebec's national parks. The activity's designer, ASTROLab's science communicator Guillaume Poulin, was awarded the Interpretive Annual Award by the AQIP (national interpretive association)
- A dozen media interviews
- Lecture in ALAN 2015 Sherbrooke conference
- Lecture for Memphrémagog County officials
- Lecture for Lac-St-François home owners association
- Lecture for the Earth Hour in Westmount







## Regulation

- Design and production of an eco-lighting training program for municipalities employees and politics. The project was a collaboration with IDA-Qc and AQME (Quebec association for energy control), under the funding of a sustainable development program. It features the AIR exterior lighting regulation model (AQME-IDA-RICEMM).
- In it's year number one, the training was given by AQME in Quebec, Montreal and Shawinigan, and by the ASTROLab for Sherbrooke and the Eastern townships.
- Participation in a statewide light pollution standard project for the Quebec province. The project was initiated by IDA-Qc and is lead by the Bureau de normalisation du Québec (Quebec standards bureau).
- Initiation of lighting fixtures survey project in the Granit County. Municipal assessors are now required to include lighting fixtures in the properties database. This is to help with regulatory enforcement in regard to vested rights and to know if forbidden fixtures have been installed before or after regulation implementation.

**7 MAI 2015**

## FORMATION ÉCLAIRAGE EXTÉRIEUR ET ENVIRONNEMENT NOCTURNE



**Formation éco-éclairage**  
La réserve internationale de ciel étoilé du Mont-Mégantic (RICEMM) vous invite à participer à la formation « Éclairage extérieur et environnement nocturne » qui se donnera à l'ASTROLab du parc national du Mont-Mégantic. Préparée conjointement avec la RICEMM, l'AQME et l'IDA-Québec, cette formation vous est offerte à prix réduit en tant que partenaires de la réserve de ciel étoilé.

**Quand ?** Jeudi 7 mai 2015  
**Où ?** Parc national du Mont-Mégantic  
**Prix :** 75\$ pour le premier participant d'une organisation  
45\$ / participants supplémentaires (dîner et collations incluses)  
**Réservations :** remplir la formule jointe  
\*date limite : 24 avril 2015

**Programme de la journée**

**8h30** Arrivée au parc

**9h00** Formation - 1ère partie  
Les impacts de la pollution lumineuse  
Les principes d'éco-éclairage

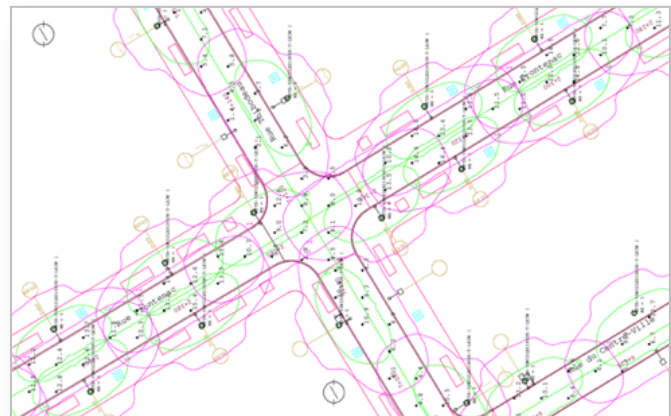
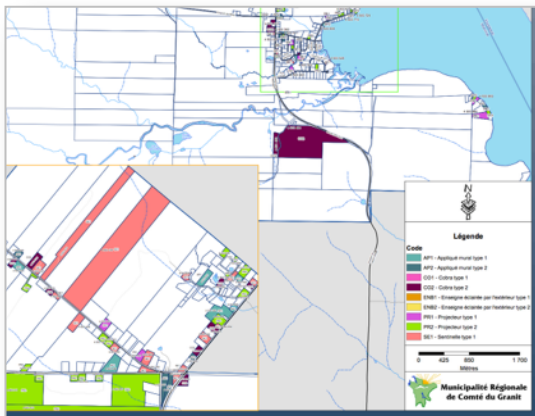
**12h00** Dîner

**13h00** Formation - 2e partie  
La réglementation  
La conversion des éclairages

**16h00** Fin

CIEL ÉTOILÉ  
du Parc national du Mont-Mégantic

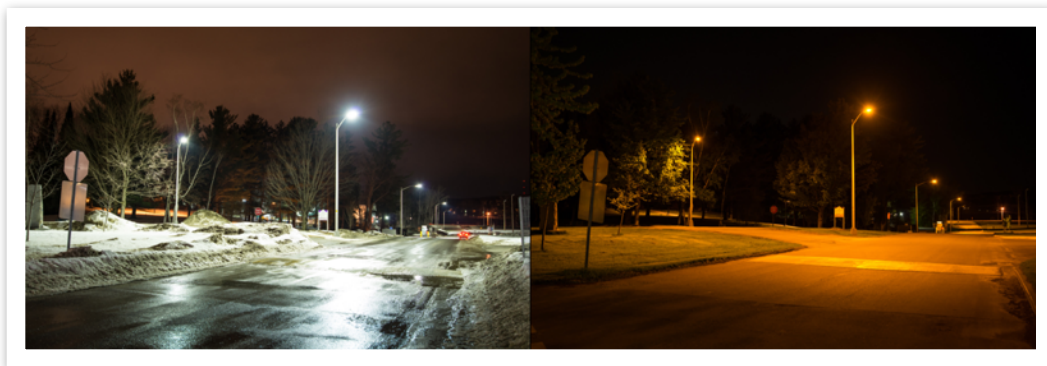
- Collaboration with the city of Lac-Mégantic for the planification of the exterior lighting of the new downtown area. Officials had a dilemma between HPS and pc-amber LED. They choose pc-amber. The engineering firm responsible for the project assisted the eco-lighting training and then submitted their planned photometry to the Reserve's staff.
- Collaboration with the city of Lac-Mégantic for the church's architectural lighting project.
- Collaboration with the town of Courcelles regarding the installation of new street lighting fixtures. The white LED project promoted by some officials was stopped.
- Collaboration with the city of East-Angus regarding the construction of a new rest area service center featuring restaurants and gas station. Planned lighting levels were brought down significantly and pc-amber LED will be installed for the parking.
- Continuation of the Granit Night sky Preservation Committee, bringing together some key county's officials. This year's main project was about implementing a regulatory enforcement experimental protocol.
- Some individual commercial cases of non-compliant fixtures are reported and municipal authorities are aware of theses. Some have been fixed, but other have not. MMDSR will make a followup in 2016.



## Conversion

Pc-amber LED lighting conversion went forward on the Reserve's territory in 2015

- Sherbrooke continued the gradual implementation of the 700+ pc-amber LED fixtures bought in 2014. People familiar with this project are very pleased with the results. The initial project won a prize from the IES.
- New commercial buildings and parking lots in Sherbrooke are now lit with pc-amber or a 2200K+amber LED in Sherbrooke.
- Scotstown replaced 20 HPS fixtures with pc-amber LED.
- New commercial parking lots in Lac-Mégantic installed pc-amber LED lighting.
- Bishop University had to replace new 4000K white LED lighting with pc-amber lighting. Not only the white lighting was illegal, but it was also a catastrophe for the atmosphere of this patrimonial campus and its architectural landscape.



- Filtered white LEDs were installed on Cegep street in Sherbrooke.
- Efforts were made to stimulate private partners to increase the availability of pc-amber lighting. Of them, Philips, Lithonia Lighting, Cyclone, Snoc, Lumca and Lekla all have available products in the province of Quebec. We are still in contact with GE and others brands to get an even better offer of night friendly lighting.



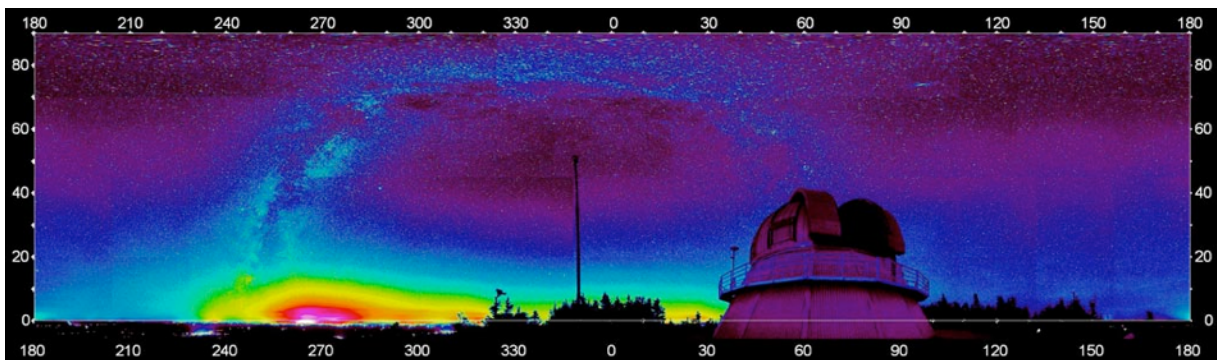


## Monitoring

Monitoring of light pollution around Mont-Mégantic is made by different means. Today, it still represents one of the things we need to improve to have a better knowledge of the evolution of the sky brightness inside the reserve.

- Sky brightness above MMIDSR, before and after it's creation, has been estimated using advanced modelling and satellite data (Aubé, 2014).
- Direct monitoring at MMIDSR is made by professor Martin Aubé, from the CEGEP de Sherbrooke. In recent years, data is acquired with two instruments installed at the ASTROLab (a photometer and a spectrometer). These instruments have been taking nightly measurements and spectral data of light pollution at the base of Mont-Mégantic since 2011. Exhaustive data analysis is not yet available, but preliminary analysis by professor Aubé shows that light pollution seems to be increasing in the reserve. The source of this increase is subject to interpretation. Installation of white LEDs around the reserve could be one cause, but the «standard growth» of the light fixtures number in urban environments remains the main suspect. More data and analysis is needed to confirm and interpret this tendency.

- Some measurements were made with a manual SQM, but a better protocol is needed for these. Measurements are not made frequently enough and variation in cloudiness, haziness, the positions of the the Milky way and brights stars all introduce some variation in the data. On moonless nights, SQM readings range between 21.30 to 21.60 with an average around 21.45. A proper calibrated SQM-LE will help us get better readings in the future.
- We are also working on installing a SQM-LE at the ASTROLab or at the Popular Observatory in the near future. The easily accessible and comparable data of the SQM will help us in monitoring light pollution at Mont-Mégantic. Comparison between clear and cloudy nights will also be possible with the recent installation of an all sky camera at the Popular Observatory.
- Qualitative sky brightness and bad fixtures monitoring by park staff members is continuous. Visual observation of the Milky way, M31, zodiacal light around the equinox and M33 give us a good indication of the sky quality. Panoramic pictures, frequent visual observations and car trips at night also help us monitor the installation of badly shielded lights so we can proceed with the municipal inspectors.
- In 2007, sky brightness was also measured by Chad Moore, of the Night Sky Team, US-National Park Services.



## Management

2015 also marked a special year for the Mont-Mégantic's International Dark Sky Reserve since one of its core leaders and founders, Pierre Goulet, retired after 15 years at the head of the national park, ASTROLab and Reserve. To honour his work, Pierre Goulet was awarded the Dark Sky Defender award by the IDA, and the 2015 annual personality award by the Eastern Townships Tourism Board.

Thank you Pierre! The main contacts for MMIDSR are now Sébastien Giguère and Rémi Boucher. Operation the Reserve is carried out by the ASTROLab corporation, with support of the Mont-Mégantic National Park.

