

# A unique service for the Quebec diving community

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## . Introduction .

The province of Quebec is the largest province in Canada, it is roughly three time the size of Texas. It has over 8000 lakes and 4500 rivers and is split in two by the St Lawrence River. Because of this, its hydroelectric power grid is the most important one in the world and manages over 60 hydroelectric dams and over 400 dams. (fig. 1)

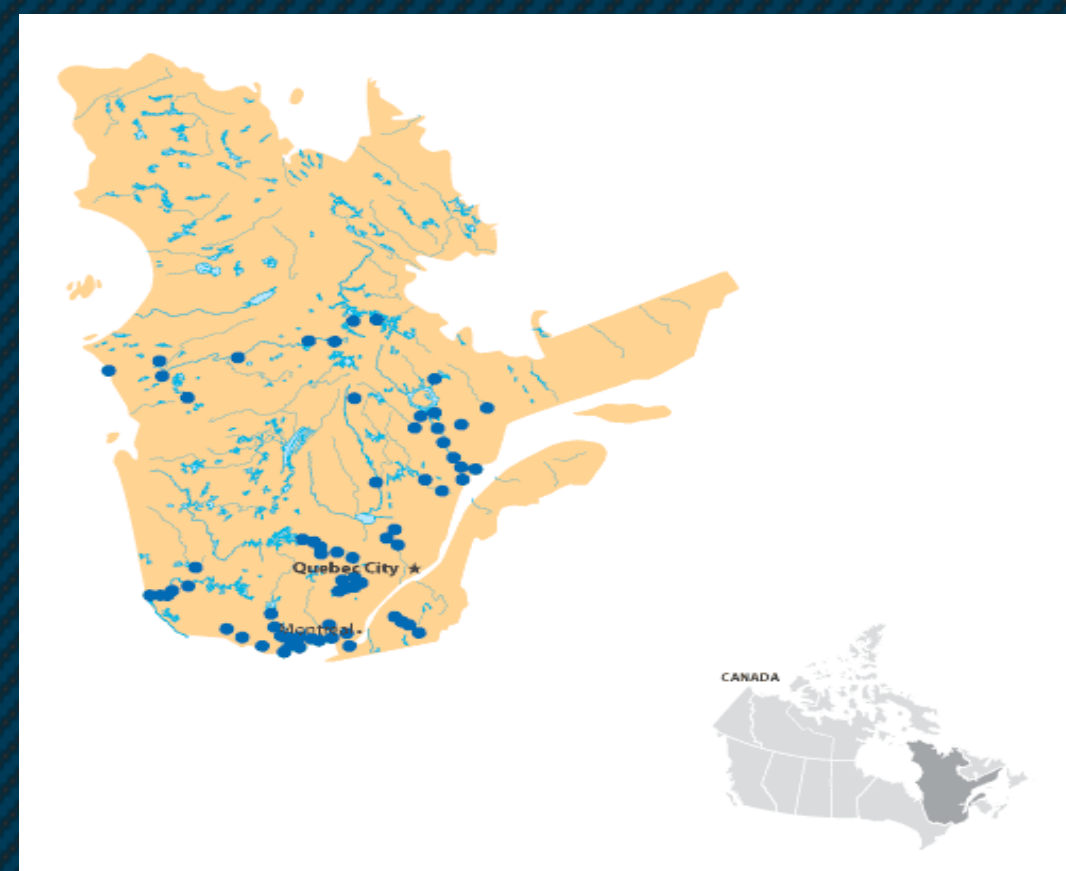


Figure 1: province of Quebec hydroelectric dams

Some of these dams are very old and isolated and need constant underwater inspection and repair by commercial divers. In the 90's, the mortality rate for those commercial divers was 3.9/1000 workers-year. Compared to the mortality rate in construction workers (0.18), this represented a 20 fold increase. The emergency services needed to help those divers in the event of an emergency were often not readily available. For that reason, the *Commission de la santé et de la sécurité du travail* (Quebec Workers Compensation Board) have ordered a complete review of the regulations regarding commercial diving. The implementation of the *Centre de médecine de plongée du Québec* (CMPQ) was necessary to coordinate the emergencies contingency plan and to guaranty that proper care was given to those divers.

The latest survey from the *Fédération Québécoise des Activités Subaquatiques* (FQAS) regarding the sport diving community showed that over 5000 Quebecers practice recreational diving regularly and about 2500 visitors come annually to experience diving. This diving community needs an emergency help line that could speak both French and English but, also understand the specific aspects related to location of these dive sites.

## . Methods .

### Our services

One of the major feature of the CMPQ services is the delegation of medical act to the onsite hyperbaric chamber operator. In the event of a DCS, the chamber operator would initiate the hyperbaric treatment and would call the emergency help line's hyperbaric physician. The on call hyperbaric physician would then give specific directives for the treatment of the injured diver.



Our services also include:

- promoting diving safety
- rapid medical care to the divers
- providing hyperbaric treatment according to evidence base conditions
- providing a bilingual (French and English) 24/7 emergency and information help line dedicated to assist divers and medical personnel
- supporting remote chamber operators during treatments
- implementing and proposing diving emergency contingency plan
- providing medical education to divers and medical personnel
- supporting the diving community in various diving activities
- participating as board members on various diving and hyperbaric standard committee

### Promoting installation of hyperbaric stretcher in remote location

There are two public hospital base hyperbaric chambers in the province. (figure 2) Those chambers are located in urban centers, and the preferred dive sites are far from those centers. Transportation of injured divers from those remote locations represents many hours and therefore increases the risk for some serious sequelae.

For this reason, the CMPQ is helping rural communities to install hyperbaric stretchers in areas where divers would greatly benefit by being treated rapidly.

One of those areas, is *Les Escoumins* on the St-Lawrence River, this area is visited by 2 500 to 3 000 divers annually. The nearest chamber being 4 to 5 hours away by road. In 2008, the CMPQ with the help of the FQAS and some local organizations donated a hyperbaric stretcher to this community. Officially implemented in 2009, this initiative already proved its efficacy. In 2010, they have successfully treated 2 cases of DCS in one week.



Figure 2: public hyperbaric center in Québec



Hyperbaric stretcher being loaded on a medevac helicopter



Hyperbaric stretcher inauguration

## . Results .

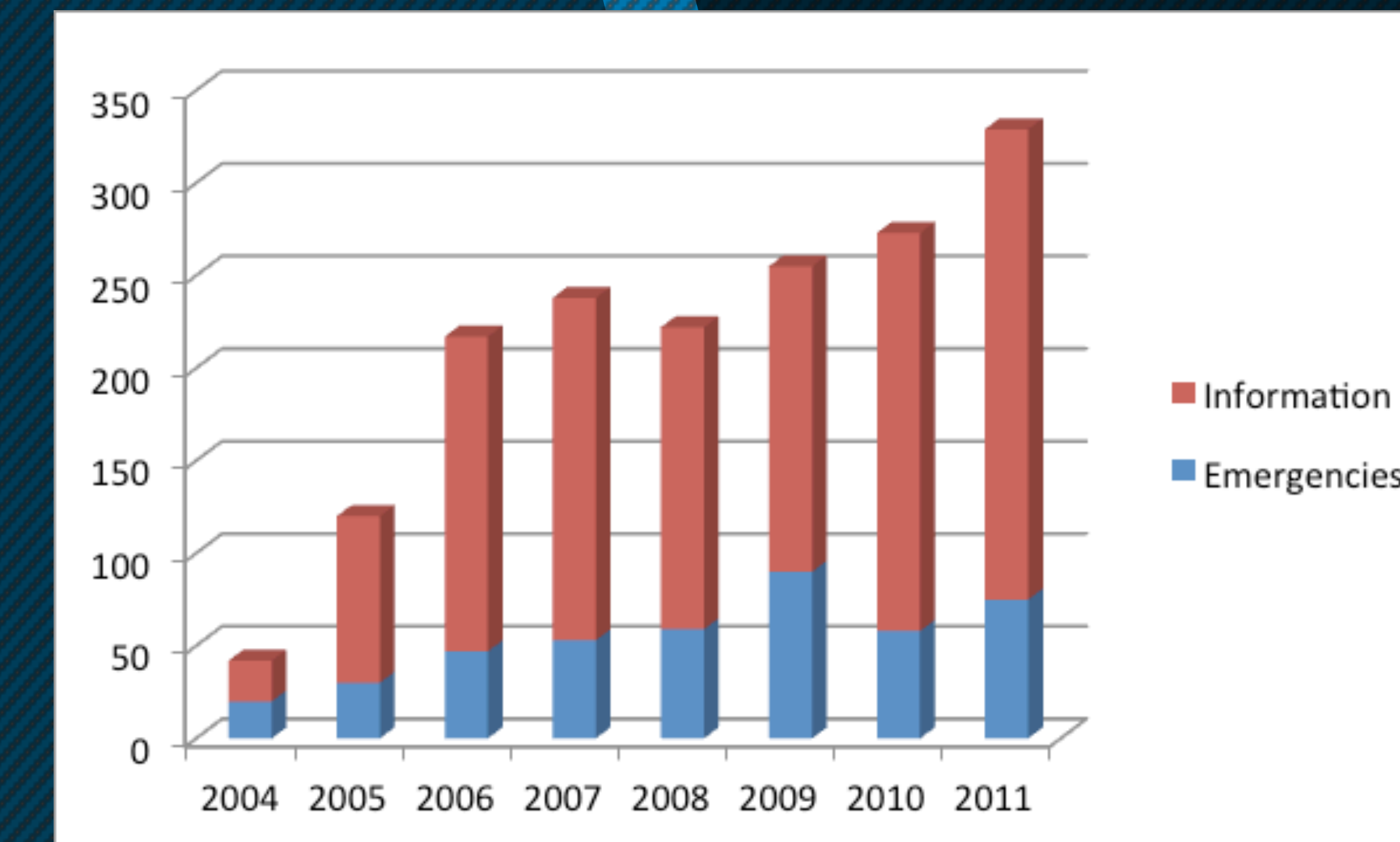


Figure 3 CMPQ total demands since 2004

Since 2004, the number of demands keeps increasing every year. (figure 3)

We get on average about 220 demands a year.

Interestingly, our services have been used from divers from other countries. For example, we have had calls from divers in South East Asia, Northern Africa and Europe. It shows that we fill a

certain gap for those divers that speak French. We are in constant collaboration with the Divers Alert Network (DAN) and we use their services regularly since they are the world's reference in diving emergencies. From the total received calls at the CMPQ, 70% are general, technical and medical information requests and 30% are emergencies. Since 2004, there have been about 90 cases of decompression sickness in the province of Quebec and most of those cases were coordinated by the CMPQ and treated successfully. Also, most importantly, the mortality rate in the commercial diving community has been zero since 2004.

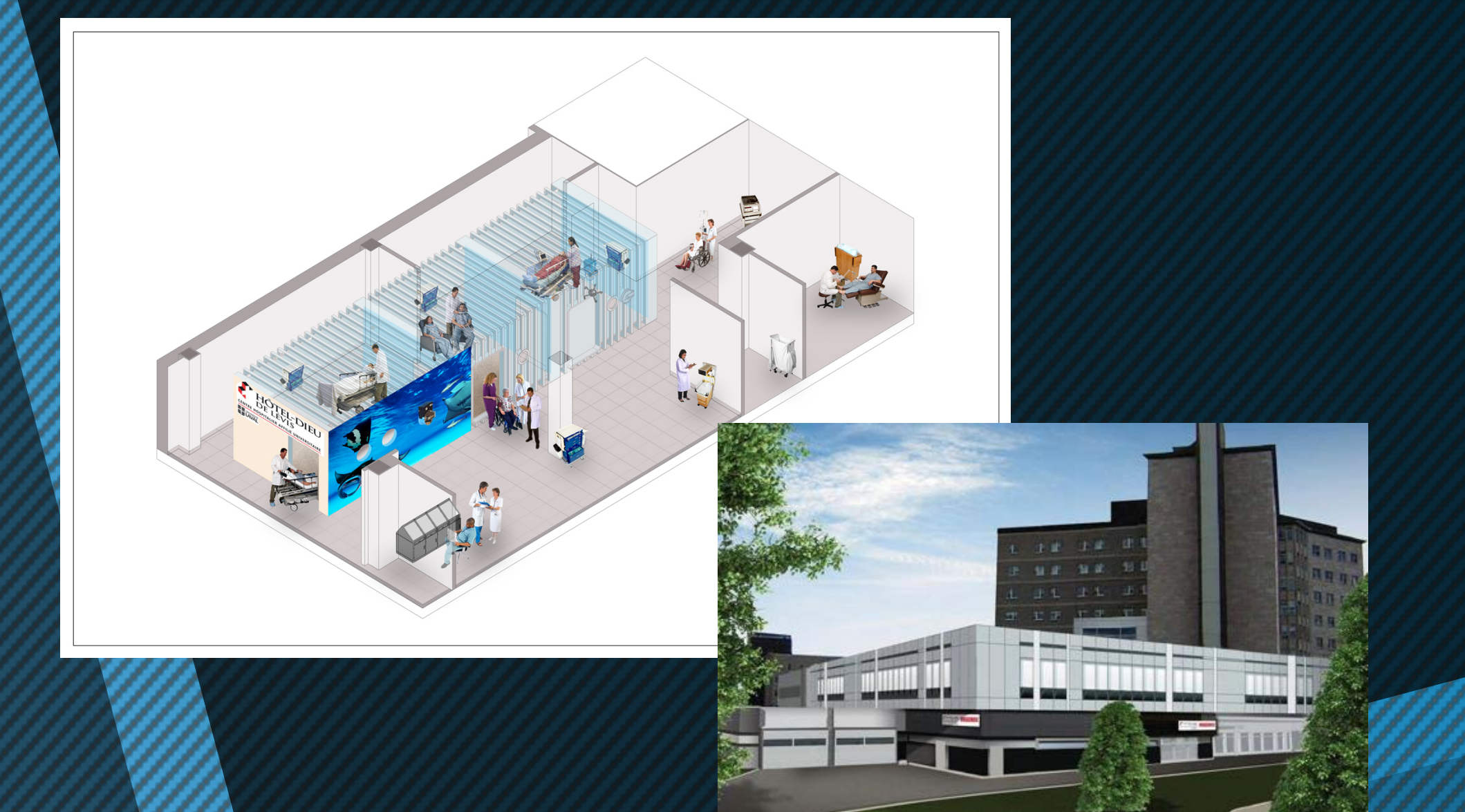
The CMPQ team consists of 9 hyperbaric and diving physicians and one emergency coordinator.

This makes the CMPQ the most important hyperbaric and diving emergency team in Canada.

With the arrival of our new triple lock rectangular hyperbaric chamber and the new hyperbaric and wound care department, our center will become the most important hyperbaric center in Canada. Those new facilities will make the CMPQ even more efficient and capable in treating diving emergencies.



Hyperbaric team at the CSSS AD / CHAU de Lévis



CSSS AD / CHAU de Lévis Hospital new hyperbaric chamber

## . Conclusion .

The *Centre de Médecine de Plongée du Québec* (CMPQ) offers unique services to the commercial and recreational divers of the Province of Québec and is gaining popularity among the diving community. Our organisation is constantly working at developing new projects with different partners involved in the commercial, public safety and recreational diving. Our ultimate goal is to improve the safety of divers.