In the midst of all the talk about man’s detrimental influence on the environment, there is one piece of good news: The concentration of the protective ozone in the atmosphere above the Arctic is increasing.

**Broken Bonds**

The ozone shield is a layer of special oxygen atoms located high in the stratosphere. These atoms absorb most of the sun’s damaging ultraviolet radiation, the same kind of radiation that causes sunburn.

Ozone is made of three oxygen atoms bonded together. These bonds can be broken by a variety of natural chemicals such as chlorine, but man‑made chemicals released into the atmosphere also break the ozone apart. **Chlorofluorocarbons**, or CFCs, used as refrigerants, propellants in spray cans, and solvents are particularly good at this.

After much scientific scrutiny, public debate and treaties between many nations, CFCs were gradually eliminated from use and production by the mid‑1990s. Now, we are finally seeing the results of those efforts.

**On The Mend**

Scientists from 35 research institutes in 14 countries completed project RECONCILE in 2013. Their findings verified once again that chlorine‑containing compounds are indeed responsible for ozone depletion.

The scientists also used improved climate models to confirm that the ozone concentration is increasing. NASA estimated that ozone levels will return to normal in about 40 years. Even the ozone concentrations at the South Pole, where the **ozone layer** was thinnest, should be back to normal levels by the end of the century.

The ozone layer restoration is a good example of the length of time needed for environmental recovery. It can take decades for changes to show an effect. It’s also an example of how nations can work together to correct global environmental problems.

在关于人类对环境的有害影响的所有讨论中，有一条好消息：北极上空大气层中的保护性臭氧浓度正在增加。

### 破碎的债券

臭氧屏蔽层是一层位于平流层高处的特殊氧原子。这些原子吸收了大部分太阳的破坏性紫外线辐射，这种辐射会导致晒伤。

臭氧由三个键合在一起的氧原子组成。这些键可以被各种天然化学物质如氯气破坏，但释放到大气中的人造化学物质也会破坏臭氧。用作制冷剂的**氯氟烃**或CFCs，喷雾罐中的推进剂和溶剂在这方面特别好。

经过多次科学审查，公众辩论和许多国家之间的条约，氟氯化碳在20世纪90年代中期逐渐被淘汰使用和生产。现在，我们终于看到了这些努力的结果。

### 正在好转

来自14个国家的35个研究机构的科学家在2013年完成了RECONCILE项目。他们的研究结果再次证实，含氯化合物确实是造成臭氧消耗的原因。

科学家们还使用改进的气候模型来确认臭氧浓度正在增加。美国宇航局估计臭氧水平将在大约40年内恢复正常。即使在南极，那里的臭氧浓度**臭氧层**是最薄的，应在本世纪结束恢复正常水平。

臭氧层恢复是环境恢复所需时间长度的一个很好的例子。改变可能需要数十年才能显示出效果。这也是各国如何共同努力纠正全球环境问题的一个例子。